Welcome to your CDP Water Security Questionnaire 2023

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

Vale S.A. is one of the largest metals and mining companies in the world, based on market capitalization. We are one of the leading mining companies in the global market for iron ore, iron ore pellets and nickel, with operations in more than 20 countries and five continents. The company is headquartered in Rio de Janeiro and has 215.3 thousand employees (64.5 thousand own and 150.8 thousand third parties), of which 88.14% are located in Brazil. We also produce iron ore pellets, manganese ore, ferroalloys, metallurgical and thermal coal, copper, platinum group metals (PGMs), gold, silver and cobalt. We are currently involved in greenfield mineral exploration in five countries. In addition, we operate large logistics systems in Brazil and other regions of the world, including railways, marine terminals and ports, which are integrated into our mining operations. We have a distribution center to support the delivery of iron ore worldwide, directly and through affiliates and joint ventures. We also have investments in energy and steel businesses. Vale is a privately held public organization. The body responsible for guiding and directing the management of the organization is the Board of Directors. It is up to our Board to be the link between shareholders and leaders, to define Vale's general policies and guidelines, to evaluate plans and projects proposed by the Executive Committee and to measure the results achieved. Vale's purpose is to transform natural resources into prosperity and sustainable development. Vale is committed to becoming a reference in sustainability through a comprehensive approach, based on systematic planning and execution, prioritizing the management of risks and impacts (seeking to achieve zero harm to our employees and surrounding communities) and establishing a positive social, economic and environmental legacy in the places where we operate. Our global sustainability goals are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda. The 2030 Water Target, initiated in 2018, is part of the socio-environmental goals voluntarily assumed by Vale - water reduction of 10.0% of the specific use of Global fresh water (base year 2017. In 2021, the cumulative result exceeded the initial target set (reduction of 10%). Thus, the goal's update is in the validation phase and its disclosure is scheduled for the year 2023. It was defined in the study of the update to expand the objectives beyond the specific internal use and include the local aspects related to availability, quality, access to water and ecological flow in the watersheds where we operate. To this end, we have adopted indicator

6.4.2 of the United Nations 2030 Agenda. This indicator classifies the analyzed watershed in water stress levels. To meet the Water 2030 Goal, we invest in the governance of water resources, in water monitoring, in effluent reuse initiatives in the company's processes, technology and research of water resources, in water engagement and risks. As a management unit, we consider the watershed where our operations are and, more specifically, our area of influence, this will promote excellence and adherence to the principles of the International Council on Mining and Metals (ICMM). In 2020, we developed our Water and Water Resources Policy that establishes risk management and impact prevention processes for the entire production chain, and in 2023, an update of this policy will be published. Until 2022, the meetings of the Water Resources Forum, established in 2020, were virtual and it was defined that from 2023 the meetings would be face-to-face. The objectives of this forum are: to integrate the teams of the operational units; to promote technical discussions on how to manage water resources and effluents in a standardized way; to present problems and solutions; to align strategies; to present the evolution of the measures and objectives; and to seek partnerships with innovative companies. Vale remains committed to the reparation agreement of the impacts following Córrego do Feijão mine’s dam collapse on 25th January, 2019, made effective 4th of february 2021 by Vale, the Minas Gerais state government, the State and Federal Public Prosecutor’s Office, and the Public Defender’s Office for the State of Minas Gerais. Several measures beyond the reparation agreement will continue to be provided by Vale, including, but not limited to: Individual compensation, temporary housing whenever necessary, monitoring of groundwater for human consumption and studies of risks to human health and ecology. To direct and assist in work both included and beyond the reparation agreement the Board of Repair and Development was established. Its mission is to ensure focus on structuring actions that involve repairing the damage caused by the collapse of Dam I, in Brumadinho (MG). The structure coordinates socioeconomic and environmental recovery actions in municipalities impacted by the tragedy.

W-MM0.1a/W-CO0.1a

(W-MM0.1a/W-CO0.1a) Which activities in the metals and mining and coal sectors does your organization engage in?

Activity	Details of activity
Mining	Copper Iron ore Nickel Other non-ferrous metal mining, please specify
Processing	Copper Gold Platinum group metals Silver Nickel Other non-ferrous materials processing, please specify Cobalt

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1, 2022	December 31, 2022

W0.3

(W0.3) Select the countries/areas in which you operate.

Brazil
Canada
China
Indonesia
Japan
Malaysia
Oman
Serbia
United Kingdom of Great Britain and Northern Ireland

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

USD

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Other, please specify
Operational Control

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W0.7

(W0.7) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization.	Provide your unique identifier
Yes, an ISIN code	(NYSE) ISIN Code: US91912E1055

Yes, an ISIN code	ISIN Code: BRVALEACNOR0 (B3 and LATIBEX)
Yes, a CUSIP number	CUSIP number: 91912E 105 (NYSE)
Yes, a Ticker symbol	VALE (NYSE)
Yes, a Ticker symbol	VALE3 (B3)
Yes, a Ticker symbol	XVALO (LATIBEX)

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Important	Important	Water resources are essential in quantity and quality for our activities. We complement the responsible management of water resources: Firstly, we pay attention to the health and well-being of employees by ensuring drinking water for human consumption and hygiene; we are attentive to the local communities of the surroundings and there are cases that we provide water for the responsible institutions to treat and meet the demand of these communities. Our processes require various types of water, each classified according to its specific use and quality requirements. In accordance with the commitments, we optimize our uses and disposals by implementing water reuse and recirculation projects in our operating units. This increases the availability and quality of water resources in the watersheds where we operate. For this purpose, we implement control and treatment systems to provide storm drainage, process water, effluents; we consider alternative sources where there is feasibility (for example, desalination) and we define that in the operational units near the cities will be considered as an alternative source the sanitary effluents from the sewage treatment plants. Lower quality water can be used in many of our processing operations and reduces our demand for fresh water. Thus,

			recycling and reuse initiatives are essential for water security in our operations. Vale's global environmental goals prioritize issues related to water resources, which proves that future dependence on fresh water in direct operations tends to decrease, since the main objective of the 2030 Water Target, implemented in 2018, is to reduce the withdrawal of fresh water for use in production processes. Many of our suppliers' products also rely on good quality water in their production. Thus, in 2022, we mapped and classified our suppliers for water dependence and respective water risks. The strategy to engage these suppliers is under construction in conjunction with socio-environmental issues
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Important	Water reuse and alternative sources, such as: reuse of industrial and sanitary effluents, rainwater harvesting and desalination; are prioritized in the supply of water for Vale's activities. Seeking initiatives to increase the optimization of water conservation, the management of water demand, considering reuse, and the use of third-party effluents, rainwater harvesting and desalination, as opposed to the use of fresh or potable water, is fundamental to our guiding strategy of our water resources policy. The amounts of water from reuse, rainwater harvesting and desalination in 2022 were: 507 million m³, 4.7 million m³ and 1.7 million m³, which results in an index of 83% of the total water demand to keep the business on track and reduce freshwater withdrawn, which represented 17% of the total demand. Considering that water dependence will not change in the future, Vale invests in reuse initiatives, the search for new technologies, the development of studies and the expansion of the monitoring network through the Target Water Program. This type of water is also important for Vale's main customers, which are the steel industries. Most of this water reuse is for cooling systems through recirculation , without compromising the process quality. The steel industry has high rates of recirculation, showing the importance of reuse, brackish and/or

			produced water in the quality required for its intended use.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Frequency of measurement	Method of measurement	Please explain
Water withdrawals – total volumes	100%	Monthly	The measurement of water withdrawals is preferably through: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels ; 4) when there is no possibility of measurement is calculated according to the specificity of each operational unit. Since 2018, when the water 2030 target was launched, more than 600 new flow meters have been installed.	Water withdrawal volumes are crucial for complying with GRI's performance indicators, which are consolidated monthly and include the operating units under our control. Each water resources responsible for the operational unit records the results monthly in Credit360, following the ICMM's guidelines. Annually these data is reported in our integrated report, which undergoes an audit. The past two years' data has been audited by PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to

				GRI standards. Moreover, to water resources policy, we have a water and wastewater management standard that provides guidance on water withdrawn, legal requirements for surface and groundwater use, measurement, monitoring, usage, and discharge. Our program includes integration and automation of monitoring systems, management tools, iterative dashboards and indicators. Additionally, we identify new measurement technologies and suppliers to enhance our monitoring capabilities.
Water withdrawals – volumes by source	100%	Monthly	The measurement of water withdrawals is preferably through: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels ;	Water withdrawal volumes by source are monitored in 100% of our direct operations. Measuring this aspect allows us to define the strategy for the

			4) when there is no possibility of measurement is calculated according to the specificity of each operational unit. Since 2018, when the water 2030 target was launched, more than 600 new flow meters have been installed.	priority areas and further refine the water-related targets and performance Improvements. Each water resources responsible for the operational unit records the results monthly in Credit360, following the ICMM's guidelines. Annually these data are reported in our integrated report, which undergoes an audit. The past two years' data has been audited by PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to GRI standards. Moreover, to water resources policy, we have a water and wastewater management standard that provides guidance on water withdrawn, legal requirements for surface and groundwater use,

				measurement, monitoring, usage, and discharge. Additionally, we identify new measurement technologies and suppliers to enhance our monitoring capabilities.
Entrained water associated with your metals & mining and/or coal sector activities - total volumes [only metals and mining and coal sectors]	100%	Monthly	The value of this aspect of the water is obtained at the beginning of the project, verifying the percentage and density of the solids of the tailings. Throughout the operation this is calibrated, either by laboratory tests or by the monthly results of the water balance.	This volume of water, in mining, is basically the water that gets trapped in the tailings. The volume of water entrained is heavily dependent on placement densities, data usually provided by process engineers, and varies by commodity. The totality of our operations are calculated, but not yet 100% measured, a smaller portion is still estimated, based on indirect calculations, which therefore may have errors greater than 5%.
Water withdrawals quality	100%	Monthly	Common analytical methods used for trace metal analysis include atomic absorption	To determine the source of water supply, Vale assesses both the qualitative

			spectroscopy (AAS), inductively coupled plasma optical emission spectrometry (ICP-OES), and inductively coupled plasma mass spectrometry (ICP-MS). We have contracted accredited labs to collect and analyze water quality and installed sensors for continuous monitoring. We also streamlined the analysis process, granting our specialized professionals' agility via our water monitoring management system.	and quantitative aspects of potential alternatives. Furthermore, we conduct studies to request permission from responsible agencies for the use of water. Once the water supply source is defined, a monitoring program is established considering the variables to be monitored, frequency, and measurement method. It should be noted that some countries require disclosing monitoring results to regulatory bodies as per water use permission granted by them. Our Vale Water Resources and Effluents Management Standard determines the minimum requirements that the monitoring plans of our operating units must contain, and when necessary are

				complemented according to the guidelines of the management bodies. Our standard provides guidelines on sample collection and preservation methodology, analytical methodology, sample extraction, inventory cataloging, sample traceability documentation, and warranty documentation.
Water discharges – total volumes	100%	Monthly	The measurement of water withdrawals is preferably through: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels ; 4) when there is no possibility of measurement is calculated according to the specificity of each operational unit. In addition, samples are collected, according to the frequency determined in the monitoring plan, sent to the	Water discharges total volumes are crucial for complying with GRI's performance indicators, which are consolidated monthly and include the operating units under our control. Each water resources responsible for the operational unit records the results monthly in Credit360, following the ICMM's guidelines. Annually these data is reported

			laboratory, and evaluated according to the regulatory agencies.	in our integrated report, which undergoes an audit. The past two years' data has been audited by PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to GRI standards. Moreover, to water resources policy, we have a water and wastewater management standard that provides guidance on water withdrawn, legal requirements for surface and groundwater use, measurement, monitoring, usage, and discharge. Our program includes integration and automation of monitoring systems, management tools, iterative dashboards and indicators. Additionally, we identify new measurement technologies and suppliers to

				enhance our monitoring capabilities.
Water discharges – volumes by destination	100%	Monthly	The measurement of water withdrawals is preferably through: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels ; 4) when there is no possibility of measurement is calculated according to the specificity of each operational unit. In addition, samples are collected, according to the frequency determined in the monitoring plan, sent to the laboratory and evaluated according to the regulatory agencies.	Water discharges volumes by source are monitored in 100% of our direct operations. Measuring this aspect allows us to define the strategy for the priority areas and further refine the water-related targets and performance Improvements. Each water resources responsible for the operational unit records the results monthly in Credit360, following the ICMM's guidelines. Annually these data are reported in our integrated report, which undergoes an audit. The past two years' data has been audited by PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to GRI standards. Moreover, to

				water resources policy, we have a water and wastewater management standard that provides guidance on water withdrawn, legal requirements for surface and groundwater use, measurement, monitoring, usage, and discharge. Additionally, we identify new measurement technologies and suppliers to enhance our monitoring capabilities.
Water discharges – volumes by treatment method	100%	Monthly	Each operational unit recorded the volumes discarded on the Credit 360, stratified in the following treatment methods: Primary treatment, physical removal of suspended solids and floating material, typically by sedimentation; Secondary treatment, degradation of organic matter and reduction of solids through biological treatment;Tertiary treatment,	Vale's water monitoring program includes water discharges by treatment method. The information on the volumes of disposals and method of treatment is consolidated per unit monthly on the Credit 360 platform, include the operating units under our control and disclosed globally annually in the integrated report.

			additional treatment needed to remove suspended, colloidal and dissolved constituents.	We consider the GRI methodology, ICMM guidelines and specificities of our operations to calculate the water balance. Annually these data is reported in our integrated report, which undergoes an audit. The past two years' data has been audited by PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to GRI standards .
Water discharge quality – by standard effluent parameters	100%	Monthly	Vale follows standards defined by local bodies. For the purposes of publication in the integrated report we adopted the classification defined by the ICMM, namely: High quality: total dissolved solids < 5,000mg/l and pH between 4 to 10, without components, chemical compounds and contaminants in concentrations harmful to human health.	The discharge quality information is recorded and consolidated per unit monthly on the Credit 360 platform, include the operating units under our control, and disclosed annually in the integrated report. We consider GRI methodology, ICMM guidelines. Our Integrated Reporting are audited, and in the last 2 years the company

			Low quality: Total Dissolved Solids > 5,000mg/l or pH < 4 or > 10 or have chemical components or compounds or contaminants in concentrations harmful to human health	responsible for this audit was PwC Auditores Independentes Ltda., according to ISAE3000 and GRI standards. We ensure that our effluent releases adhere to the quality standards set by the regulatory bodies in each location. Our results are regularly reported to the relevant authorities in accordance with their stipulated frequency. As there is no standardized quality index by the competent authorities for the mining sector, we follow the classification guideline defined by the ICMM to disclose the quality of our effluents in our public reports. This guidance can be found in Water Reporting, Good Practice Guide, 2nd Edition, page 35 (low quality and high quality).
Water discharge quality –	100%	Yearly	Common analytical methods used for	The Vale water monitoring

emissions to water (nitrates, phosphates, pesticides, and/or other priority substances)			the analysis of trace metals include atomic absorption spectroscopy, inductively coupled plasma optical emission spectrometry, and inductively coupled plasma mass spectrometry. The Monitoring Plan of each operational unit includes the identification, quantification and characterization of the effluents generated and plans to monitor the quality and quantity of effluents.	program considers the standard effluent parameters as determined by the management bodies of each country or region. The quality information of the discarded volumes is recorded in a stratified form by monitoring point, parameter and location in the Hydro Geoanalyst, the results are consolidated per unit monthly, include the operating units under our control, on the Credit 360 platform and disclosed globally annually in the integrated report. We consider the GRI methodology, ICMM guidelines and specificities of our operations to calculate the water balance. The data that makes up the Integrated Reporting are audited, and in the last 2 years the company responsible for

				this audit was PwC Auditores Independentes Ltda., according to ISAE3000, including the adherence and method of treatment to GRI standards.
Water discharge quality – temperature	100%	Monthly	For environmental legislation, it is a standard parameter of the effluent, measured in the field and in the laboratory, at least once a month.	The information on the quality of the volumes discharged is recorded in a stratified form by monitoring point, parameter and location in the Hydro Geoanalyst, the results are consolidated per unit monthly, include the operating units under our control, on the Credit 360 platform and disclosed globally annually in the integrated report. We consider the GRI methodology, ICMM guidelines and specificities of our operations to calculate the water balance. The data that makes up the Integrated Reporting are audited, and in the last 2 years

				the company responsible for this audit was PwC Auditores Independentes Ltda., according to ISAE3000, including the adherence and method of treatment to GRI standards.
Water consumption – total volume	100%	Monthly	Water Consumption (C) is calculated by the formula C= (A+B)-D where A is total water withdrawn used for operational activities, B is total stored water and, D is total water discharged. The consumption is calculated and recorded monthly in Credit360 by management responsible for each operating unit water resources. These data is validated by the corporate team of experts following the ICMM. The totality of the consumption is calculated, but not yet 100% measured, a smaller part still estimated	Vale considers consumption the portion of water that after its use is unavailable for other use. The information on water consumption includes the operating units under our control and is consolidated per unit monthly on the Credit 360 platform and disclosed globally annually in the integrated reporting. We consider the GRI methodology, ICMM guidelines and specificities of our operations to calculate the water balance. The data that makes up the Integrated Reporting are audited, and in the last 2 years

				the company responsible for this audit was PwC Auditores Independentes Ltda., according to ISAE3000, including adherence to GRI standards.
Water recycled/reused	100%	Monthly	The volume of water recycled/reused is monitored monthly and recorded on CRedit360, software used to manage sustainability indicators. About the recycled/reused water, the data are collected as follows: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels; 4) when there is no possibility of measurement is calculated according to the specificity of each operational unit.	The information on recycled/reused water is consolidated per unit monthly on the Credit 360 platform, include the operating units under our control and is disclosed globally annually in the integrated reporting. We consider the GRI methodology, ICMM guidelines and specificities of our operations to calculate the water balance. The data that makes up the Integrated Reporting are audited, and in the last 2 years the company responsible for this audit was PwC Auditores Independentes Ltda., according to ISAE3000, including

				adherence to GRI standards.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Monthly	The monitoring is through: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in open channels; 4) when there is no possibility of measurement is calculated according to the specificity of each operating unit; 5) Qualitative data and water samples collected and sent to the laboratory accredited periodically in accordance with the legislation. The physico-chemical analyses carried out are in accordance with the limits established for drinking water.	All Vale operations provide WASH services to employees and contractors. We follow social action standards and principles on business and human rights, which are based on the guidelines of the United Nations Human Rights Council. These services are required by law, through labor laws and Vale follows fully in compliance. The analysis in these waters is carried out by monitoring monthly. Vale guarantees that the water that goes to all workers is of good quality and quantity, as it performs preventive maintenance on all water supply equipment.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, how do they compare to the previous reporting year, and how are they forecasted to change?

	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Please explain
Total withdrawals	397,000	Higher	Other, please specify The volumes available to the environment and third parties have increased due to the completion of water withdrawn and distribution works that aim to provide relief to the society affected by the devastating rupture of the Brumadinho dam.	Lower	Increase/decrease in business activity	The difference arose due to two main reasons: 1) a change in the methodology of water consumption for operational purposes in 2022, which were implemented to align with the ICMM methodology. Prior to this change, the use of rainfall water was classified as reused water, but with the new methodology, it is considered new water; 2) The volumes available third parties have increased due to the

						completion of water withdrawn and distribution works that aim to provide relief to the society affected by the devastating rupture of the Brumadinho dam. And the volume to the environment is due to increase in business activity For the forecast, there is a preview of reduce the use of fresh water due to segregation of both ferrous and base metals business in distinct companies with independent management.

Total discharges	298,800	Higher	Increase/decrease in business activity	Higher	Investment in water-smart technology/process	The effluents generated in Vale's operating units come from industrial uses and human consumption. These effluents are reused in the company's processes whenever possible, and in 2022, 40,300 ML were disposed of in the environment, within the release standards established in local legislation. Since 2022, we included all water that has gone out of our limits, including unused water returned to the environment and water made

						available to third parties, such as the population. In 2022, the volume of unused water returned to the environment increased by 198%. It occurred due to hydrological year 2021/2022, mainly in Brazil operations, when was recorded precipitation volumes above the averages. Since operational control levels of our dams has been implemented, as a result for the precipitations, it was necessary to withdraw water from the reservoirs throughout

						the year to maintain the safety quota. In addition, the volume of water made available to third parties increased by 264%, as the works for capture and distribution to society impacted by the rupture of the Brumadinho dam were completed. Future volumes will vary, and Vale makes a forecast for each specific unit separately. Vale seeks to eliminate its releases of industrial effluents through reuse and thus replace new withdrawals of fresh water with treated effluents. Therefore,

						future volumes will decrease.
Total consumption	72,000	Lower	Investment in water-smart technology/process	Lower	Investment in water-smart technology/process	Explanation for the change in value, compared to the previous year: In 2022, the total consumption of water for our production processes was 72,000 ML, which is about 20% less than the volume consumed in 2021 . Our strategy and goal are to reduce the use of fresh water. We used to optimize it through reuse, new processing technologies, replacement of fresh water by alternative sources

						when feasible (use of rainwater, treated effluents from third parties and desalination). We have defined that for the coming years we will seek even more efficiency, that is, to reduce the use of water per unit of production It is important to note that climate change is currently impacting the availability of water and will continue to do so in the future. The explanation of why the balance (C=W-D) is not reached: we are also subtracting

						the volume of fresh water stored, which is equivalent to 25,000 megaliters, in accordance to figure on Integrated Report, pg. 53.

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress, provide the proportion, how it compares with the previous reporting year, and how it is forecasted to change.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Identification tool	Please explain
Row 1	Yes	11-25	Higher	Change in accounting methodology	Lower	Increase/decrease in efficiency	WRI Aqueduct Other, please specify Indicator 6.4.2. of the UN 2030 Agenda (FAO Food and Agriculture Organization of the United Nations)	In 2022, the methodology for assessing water stress areas was made by using the WRI Aqueduct and Indicator 6.4.2. UN of the 2030 Agenda.

								According to the WRI Aqueduct, only our production unit located in Oman is identified as operating in a water-stressed area. However, it is important to note that the Oman plant utilizes a desalination process for water sourcing, which significantly mitigates the impact of water scarcity. On the other hand, the UN-FAO Indicator 6.4.2 allows a better regional assessment by classifying water stress with data on catchments and

								availability for use in the analyzed watershed. It is calculated from the ratio between the total fresh water withdrawn in the watershed and the total water resources available for use (Defined by the formula EH = TFWW / (TRWR - EFR), where: EH = Water stress level, given in %; TFWW = Total fresh water abstracted; TRWR = Total renewable freshwater resources, including surface water EFR = Environmental flows

								(water required for aquatic life), in m³/s.). We delimit and analyze our entire area of influence – in the sub-basins where we operate. The percentage of our total freshwater withdrawals are classified as follows: critical (12%); high (2%); medium (9%); low (30%), and; no stress (46%). About 1% was excluded from the analysis because they were operations with negligible water use or because they were paralyzed operations. The units identified

								as experiencing water stress will be reported based on the findings of the UN-FAO Indicator 6.4.2, as Vale continuously strives to improve its water resource usage data. The increase compared to the previous year is mainly due to the change in methodology. We adopted the results of this analysis to define the new freshwater reduction targets. Being that for those regions with classification of high or

								critical level of water stress will have percentages of reduction more daring.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	237,128	Higher	Investment in water-smart technology/process	This source is relevant since the activity depends on water to produce, whether in human consumption, processing and environmental controls. Recognizing its importance, the company has set targets for reducing freshwater water use. So, in this way, Vale has made several actions: increase of water reuse, implement new technologies, expand monitoring of the

					resource, reduce losses, among others. These efforts are aimed at reducing the environmental impact of mining operations and ensuring the sustainable use of water resources. By prioritizing responsible water management, the company is committed to contributing to a more sustainable future for all.
Brackish surface water/Seawater	Relevant	1,140	This is our first year of measurement	Other, please specify This is our first year of measurement	We have only one operation located in Oman that its water supply is through third parties that use desalination technology, which replenishes 1.4% of the total Vale of water captured for use. A technical and financial feasibility project is underway to use desalination technology in a port operation in Brazil, in order to reduce dependence on

					the use of fresh water.
Groundwater – renewable	Relevant	152,332	About the same	Investment in water-smart technology/process	This source is relevant because it represents 20% of the total water withdrawn. Compared to 2021, the volume was lower because the compensation was made within renewable groundwater and fresh surface water, so we decided to minimize the impacts on fresh surface water, preferring to use renewable groundwater. Future volumes are expected to decline as we implement reduction measures to meet our 2030 water reduction targets. We are continually improving our approach and will review water targets in the coming years to ensure we balance potential increases in production with water

					withdrawals, ensuring greater efficiency and ultimately decreasing water intensity. Since 2021, we have included all water that has exceeded our limits, including unused water returned to the environment.
Groundwater – non-renewable	Not relevant				Explanation of why groundwater - non-renewable is not relevant: We do not draw groundwater from non-renewable sources. This approach is not expected to change in the near future, so the non-renewable groundwater reported will remain the same.
Produced/Entrained water	Not relevant				Explanation of why produced/retained water is not relevant: We do not use produced water in our operations and do not intend to use it in the coming years. Currently,

					this amount is not consolidated in Credit According to the publication of the Water Reporting, 2nd Edition (ICMM) good practices guide, we will incorporate the changes in the Credit360 tool and this is one of the information we will consolidate. The expectation is that we will be ready in 2024, as it requires a review of the system's architecture, a review of Vale's water and effluent resources standards and training of professionals.
Third party sources	Relevant	6,400	About the same	Investment in water-smart technology/process	Explanation of why third-party sources are relevant: It is relevant because some of our operations use water from utilities for human consumption. Explanation of the variation compared to the previous year: In

					2022, the total data on water withdrawal by third-party sources was 6,400 megaliters, approximately the same as the previous year (6,200). In comparison with the previous year, the volume remains practically the same because the amount of water collected is the same, there is no new source, and the distribution contracts remain the same. The intention for the next few years is to decrease the volume contracted. The trend is to reduce the value of this outsourced source each year, increasing desalination projects, being able to replenish part of this water in places close to the sea and installing underground water collection

					wells in a sustainable way.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water	Relevant	181,700	Higher	Investment in water-smart technology/process	Explanation of why surface fresh water is relevant: It is relevant because all of our treated effluents are discharged into surface fresh water and 61% of our total discharges are destined for surface freshwater. In addition, unloading in mining operations sometimes occurs when there are large rainfall events. Explanation of the variation in relation to the previous year: The volume is higher than in the previous year due to the expansion of the operation in hangover areas,

					and Vale uses this water in its operation, therefore, the surface discharge is reduced. It is not possible to predict whether future volumes will increase or decrease, as discharge volumes in the mining sector are mainly driven by rainfall. The volumes available to the environment and third parties have increased due to the completion of water withdrawn and distribution works that aim to provide relief to the society affected by the devastating rupture of the Brumadinho dam.
Brackish surface water/seawater	Not relevant				Explanation of why brackish surface water/seawater is not relevant: It is not relevant because we do not discharge any effluent into brackish surface water or

					seawater. And we do not expect to give discharge in the near future.
Groundwater	Not relevant				Explanation of why groundwater is not relevant: It is not relevant because we do not discharge effluents into groundwater. In the future, Vale will invest in research aimed at artificially recharging aquifers and one of the sources may be treated effluents.
Third-party destinations	Relevant	112,700	Higher	Other, please specify The volumes available to the environment and third parties have increased due to the completion of water withdrawn and distribution works that aim to provide relief to the society affected by the devastating rupture of the Brumadinho dam.	Explanation of why third-party destinations are relevant: It is relevant because we calculate the discharge by third-party destinations along with the provision for the population, and third-party destinations account for 38% of our total discharges. Explanation of the variation in relation to the previous

					reference year: The volumes available to the environment and third parties have increased due to the completion of water withdrawn and distribution works that aim to provide relief to the society affected by the devastating rupture of the Brumadinho dam.

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	Primary reason for comparison with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Relevant	0.08	Lower	Increase/decrease in business activity	100%	Vale considers the CDP criteria to classify the treatment of industrial discharges. (Tertiary treatment: Tertiary treatment involves the additional treatment

						required to remove suspended, colloidal and dissolved constituents (nutrients, heavy metals, inorganic contaminants and others) remaining after secondary treatment through various processes, including filtration of granular media, biological nitrification-denitrification, biological phosphorus removal, chlorination, etc.). The operations in Brazil comply with the CONAMA 430/2011 standard, and in some cases have more restrictive local regulations,

						as is the case for the following Brazilian states and their respective regulations: Minas Gerais, DELIBERAÇÃO NORMATIVA CONJUNTA COPAM-CERH/MG Nº 8/2022; Espírito Santo, RESOLUÇÃO COMDEMA Nº 02, DE 5 DE JUNHO DE 1991; Rio de Janeiro, NT-202.R-10 INEA. International operations comply with the regulations of the respective operating countries, according to: Canada, Metal and Diamond Mining Effluent Regulations

						(SOR/2002-222); Japan, National Effluent Standard; Indonesia, Government Regulation No. 82/2001; Malaysia, NATIONAL WATER QUALITY STANDARDS; United Kingdom of Great Britain and Northern Ireland, The Water Supply (Water Quality) Regulations 2016, nº 614.
Secondary treatment	Relevant	5,300	Lower	Increase/decrease in business activity	100%	Vale considers the CDP criteria to classify the treatment of sanitary discharge. (Secondary treatment: Secondary treatment involves the degradation of organic matter and the reduction of

						solids through biological treatment. The removal of nutrients (nitrogen and/or phosphorus) can also be achieved at this level of treatment through a combination of chemical and biological treatments). The operations in Brazil comply with the CONAMA 430/2011 standard, and in some cases have more restrictive local regulations, as is the case for the following Brazilian states and their respective regulations: Minas Gerais, DELIBERAÇÃO NORMATIV

						A CONJUNTA COPAM-CERH/MG Nº 8/2022; Espírito Santo, RESOLUÇÃO COMDEMA Nº 02, DE 5 DE JUNHO DE 1991; Rio de Janeiro, NT-202.R-10 INEA. International operations comply with the regulations of the respective operating countries, according to: Canada, Metal and Diamond Mining Effluent Regulations (SOR/2002-222); Japan, National Effluent Standard; Indonesia, Government Regulation No. 82/2001; Malaysia, NATIONAL WATER

						QUALITY STANDARDS; United Kingdom of Great Britain and Northern Ireland, The Water Supply (Water Quality) Regulations 2016, nº 614.
Primary treatment only	Relevant	34,900	Higher	Increase/decrease in business activity	100%	Considering the CDP criterion that, in Vale, the drainage of rainwater directed to the control system is considered and sedimentation occurs there. These effluents can be used in operations or are returned to the environment after primary treatment. In the latter case, we do not consider them as effluents of operational activity and we do not

						compute them. When directed to industrial activities, they are reported as tertiary treatment effluents. The operations in Brazil comply with the CONAMA 430/2011 standard, and in some cases have more restrictive local regulations, as is the case for the following Brazilian states and their respective regulations: Minas Gerais, DELIBERAÇÃO NORMATIVA CONJUNTA COPAM-CERH/MG Nº 8/2022; Espírito Santo, RESOLUÇÃO

						COMDEMA Nº 02, DE 5 DE JUNHO DE 1991; Rio de Janeiro, NT-202.R-10 INEA. International operations comply with the regulations of the respective operating countries, according to: Canada, Metal and Diamond Mining Effluent Regulations (SOR/2002-222); Japan, National Effluent Standard; Indonesia, Government Regulation No. 82/2001; Malaysia, NATIONAL WATER QUALITY STANDARDS; United Kingdom of Great Britain and Northern Ireland, The Water

						Supply (Water Quality) Regulations 2016, nº 614.
Discharge to the natural environment without treatment	Relevant	146,000	Higher	Increase/decrease in business activity	100%	The discharge into the natural environment without treatment is considered relevant, as it represents 48% of Vale's total discharges. Vale does not consider that the unused withdrawn water needs treatment to be dumped back into the environment. The volume of water withdrawn and not used is from underground sources (lowering of the water level). Vale meets local regulatory agencies to ensure that no discharge

						leaves the company's boundaries without the requested treatment. The operations in Brazil comply with the CONAMA 430/2011 standard, and in some cases have more restrictive local regulations, as is the case for the following Brazilian states and their respective regulations: Minas Gerais, DELIBERAÇÃO NORMATIVA CONJUNTA COPAM-CERH/MG Nº 8/2022; Espírito Santo, RESOLUÇÃO COMDEMA Nº 02, DE 5 DE JUNHO DE 1991;

						Rio de Janeiro, NT-202.R-10 INEA. International operations comply with the regulations of the respective operating countries, according to: Canada, Metal and Diamond Mining Effluent Regulations (SOR/2002-222); Japan, National Effluent Standard; Indonesia, Government Regulation No. 82/2001; Malaysia, NATIONAL WATER QUALITY STANDARDS; United Kingdom of Great Britain and Northern Ireland, The Water Supply (Water Quality) Regulations

						2016, nº 614.
Discharge to a third party without treatment	Relevant	113,000	Higher	Increase/decrease in business activity	100%	The discharge to third parties without treatment is considered relevant, since it represents 38% of Vale's total discharges. Vale collects water to make it available to the population and sends it to the local distributor, and this outsourced company treats the water sent by Vale. To this end, Vale serves local regulatory agencies. The operations in Brazil comply with the CONAMA 430/2011 standard, and in some cases have more restrictive

						local regulations, as is the case for the following Brazilian states and their respective regulations: Minas Gerais, DELIBERAÇÃO NORMATIVA CONJUNTA COPAM-CERH/MG Nº 8/2022; Espírito Santo, RESOLUÇÃO COMDEMA Nº 02, DE 5 DE JUNHO DE 1991; Rio de Janeiro, NT-202.R-10 INEA. International operations comply with the regulations of the respective operating countries, according to: Canada, Metal and Diamond Mining

						Effluent Regulations (SOR/2002-222); Japan, National Effluent Standard; Indonesia, Government Regulation No. 82/2001; Malaysia, NATIONAL WATER QUALITY STANDARDS; United Kingdom of Great Britain and Northern Ireland, The Water Supply (Water Quality) Regulations 2016, nº 614.
Other	Not relevant					Vale does not treat water using any specific treatment technique and, therefore, this item (Other) is considered not relevant.

W1.2k

(W1.2k) Provide details of your organization's emissions of nitrates, phosphates, pesticides, and other priority substances to water in the reporting year.

	Emissions to water in the reporting year (metric tonnes)	Category(ies) of substances included	Please explain
Row 1	15.1	Nitrates Phosphates	For this report, we estimated the pollutant load discharged into water bodies based on the average concentrations of Nitrate and Total Phosphorus at the discharge and spillway points of the dams, multiplied by the total effluent disposal volume into the environment. In accordance with respectively national regulatory guidelines (set by CONAMA 430 in Brazil, Metal and Diamond Mining Effluent Regulations (SOR/2002-222) in Canada, National Effluent Standard in Japan, Government Regulation No. 82/2001 in Indonesia, National Water Quality Standards in Malaysia, Water Supply (Water Quality) Regulations 2016 nº 614 in United Kingdom of Great Britain and Northern Ireland), we have carefully monitored and assessed the average concentration rates of Nitrate and Total Phosphorus. The concentrations of Nitrate and Total Phosphorus were found to be within regulatory limits, with average rates of 0.317 mg/L and 0.058 mg/L, respectively. As a result, we estimate that our company released approximately 12.8 tons of Nitrate and 2.3 tons of Total Phosphorus into water bodies throughout the reporting period, totalizing 15.1 tons in the report year. Furthermore, Vale is developing an IT tool to effectively consolidate the results obtained from the control and monitoring of these release parameters at each unit, planned for release in 2024.

W1.3

(W1.3) Provide a figure for your organization's total water withdrawal efficiency.

	Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Row 1	16,810,000	397,000	42.3425692695	The company's price and revenue changes are greater than the production variations. Vale evaluates the efficiency of water

				abstraction using m³ per ton and seeks to maintain this value in 2022. In 2020 the value was 0.301 m³/ton FeEq and in 2021 it was 0.265 m³/ton FeEq. In 2022, we reviewed the metric to m³/t. Therefore, in 2021, the result was 0.247 m³/t, and in 2022, it was 0.254 m³/t. Some operational units underperformed, leading to an increase in the indicator.

W-MM1.3/W-CO1.3

(W-MM1.3/W-CO1.3) Do you calculate water intensity information for your metals and mining activities?

Yes

W-MM1.3a/W-CO1.3a

(W-MM1.3a/W-CO1.3a) For your top 5 products by revenue, provide the following intensity information associated with your metals and mining activities.

Product name	Numerator: Water aspect	Denominator	Comparison with previous reporting year	Please explain
Iron Intensity changes over the last 2 years:- 2021: 0.135 m³/t- 2022: 0.138 m³/t	Freshwater use	Ton of ore processed	About the same	Regarding the volume change in relation to 2021, the result for 2022 was about the same. This difference can be attributed to the fact that we produce multiple products, each with varying levels of specific water use. Therefore, an increase in the production of certain products with higher water intensity can impact the overall value. It is important to note that this metric serves as an indicator for our water consumption reduction target until 2030. This metric is a crucial component of our sustainability goals, as it measures our progress in reducing water consumption. By monitoring the water intensity per unit of production, we can track our performance and strive for continuous improvement. Our aim is to align with the Target

				2030, which sets forth our commitment to reducing water intensity and optimizing water usage across our operations. Looking ahead, we anticipate a reduction in water intensity in alignment with the Target 2030. We have implemented measures and initiatives aimed at enhancing water efficiency, optimizing production processes, and exploring innovative solutions. Through these efforts, we are working towards minimizing our environmental footprint and ensuring a sustainable approach to water management in line with our long-term goals.
Base metals. Intensity changes in the last 2 years: - 2021: 1.229m³/t - 2022: 1.503m³/t	Freshwater use	Ton of final product	Higher	Regarding the volume change in relation to 2021, the result for 2022 was higher. This difference can be attributed to the fact that we produce multiple products, each with varying levels of specific water use. Therefore, an increase in the production of certain products with higher water intensity can impact the overall value. It is important to note that this metric serves as an indicator for our water consumption reduction target until 2030. This metric is a crucial component of our sustainability goals, as it measures our progress in reducing water consumption. By monitoring the water intensity per unit of production, we can track our performance and strive for continuous improvement. Our aim is to align with the Target 2030, which sets forth our commitment to reducing water intensity and optimizing water usage across our operations. Looking ahead, we anticipate a

				reduction in water intensity in alignment with the Target 2030. We have implemented measures and initiatives aimed at enhancing water efficiency, optimizing production processes, and exploring innovative solutions. Through these efforts, we are working towards minimizing our environmental footprint and ensuring a sustainable approach to water management in line with our long-term goals.
Pellets. Intensity changes in the last 2 years: - 2021: 0.136 m³/t - 2022: 0.130 m³/t	Freshwater use	Ton of final product	About the same	Regarding the volume change in relation to 2021, the result for 2022 was about the same. This difference can be attributed to the fact that we produce multiple products, each with varying levels of specific water use. Therefore, an increase in the production of certain products with higher water intensity can impact the overall value. It is important to note that this metric serves as an indicator for our water consumption reduction target until 2030. This metric is a crucial component of our sustainability goals, as it measures our progress in reducing water consumption. By monitoring the water intensity per unit of production, we can track our performance and strive for continuous improvement. Our aim is to align with the Target 2030, which sets forth our commitment to reducing water intensity and optimizing water usage across our operations. Looking ahead, we anticipate a reduction in water intensity in alignment with the Target 2030. We have implemented measures and initiatives aimed at enhancing water efficiency, optimizing production processes, and exploring innovative

				solutions. Through these efforts, we are working towards minimizing our environmental footprint and ensuring a sustainable approach to water management in line with our long-term goals.

W1.4

(W1.4) Do any of your products contain substances classified as hazardous by a regulatory authority?

	Products contain hazardous substances	Comment
Row 1	No	The products in question are ferrous ores and base metals, and therefore they are not classified as hazardous according to the current regulatory bodies in the areas of operation of the company.

W1.5

(W1.5) Do you engage with your value chain on water-related issues?

	Engagement
Suppliers	Yes
Other value chain partners (e.g., customers)	Yes

W1.5a

(W1.5a) Do you assess your suppliers according to their impact on water security?

Row 1

Assessment of supplier impact

Yes, we assess the impact of our suppliers

Considered in assessment

Supplier impacts on water availability

Supplier impacts on water quality

Number of suppliers identified as having a substantive impact

2,595

% of total suppliers identified as having a substantive impact

1-25

Please explain

Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a

specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Thus, the supplier risk analysis is conducted using a Criticality Matrix, which assesses suppliers based on the categories of Environment, Social/Human Rights, and Governance. Water-related issues are included in the Environment category, where secondary data on GHG emissions, air quality, water, and wastewater are evaluated. Sources are from public data, such as IFC and SASB, among others. The final rating considers the intersection of impact magnitude and occurrence probability. Suppliers with a significant impact potential are those with a high impact magnitude and probability of deviating from the standards and guidelines of reference.

W1.5b

(W1.5b) Do your suppliers have to meet water-related requirements as part of your organization's purchasing process?

	Suppliers have to meet specific water-related requirements
Row 1	Yes, water-related requirements are included in our supplier contracts

W1.5c

(W1.5c) Provide details of the water-related requirements that suppliers have to meet as part of your organization's purchasing process, and the compliance measures in place.

Water-related requirement

Complying with going beyond water-related regulatory requirements

% of suppliers with a substantive impact required to comply with this water-related requirement

100%

% of suppliers with a substantive impact in compliance with this water-related requirement

100%

Mechanisms for monitoring compliance with this water-related requirement

Supplier scorecard or rating

Response to supplier non-compliance with this water-related requirement

Suspend and engage

Comment

The evaluation of our suppliers is an essential part of our engagement strategy. We conduct comprehensive assessments, considering all contract items and agreed-upon requirements. This evaluation allows us to ensure the quality of services provided and compliance with established standards. In cases of low scores or identified non-

conformities, we take appropriate measures, which may include warnings and the implementation of an action plan to address the issues. In more serious situations, if necessary, we may terminate the contract with the supplier in question.
Our approach to suppliers reflects our commitment to operational excellence and adherence to high ethical and quality standards. We believe that careful selection and ongoing evaluation of our suppliers are crucial to ensuring strong and sustainable business relationships, promoting service quality, and mitigating risks in our value chain.

W1.5d

(W1.5d) Provide details of any other water-related supplier engagement activity.

Type of engagement

Incentivization

Details of engagement

Other, please specify

Integration and compliance

% of suppliers by number

1-25

% of suppliers with a substantive impact

26-50

Rationale for your engagement

Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes the identified risks, taking into account their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Currently, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.
The suppliers identified as high risk and significant will be encouraged to measure and report their impacts and actions through questionnaires such as the CDP.

Impact of the engagement and measures of success

The monitoring of results will be done through the adherence of suppliers in responding to and meeting the incentivized frameworks. The frequency of this monitoring is still being evaluated.

Comment

W1.5e

(W1.5e) Provide details of any water-related engagement activity with customers or other value chain partners.

Type of stakeholder

Other, please specify

local community

Type of engagement

Education / information sharing

Details of engagement

Educate and work with stakeholders on understanding and measuring exposure to water-related risks

Rationale for your engagement

Vale firmly believes that sharing knowledge plays a fundamental role in conscious and sustainable development in the communities where it operates. As part of our commitment, we recognize the lack of studies on the topic of Water Resources in elementary and high schools. Therefore, we are dedicated to reinforcing the importance of studying this field, promoting educational initiatives and partnering with educational institutions to provide resources, educational materials, and teacher training programs. Through these actions, we seek to stimulate the interest and knowledge of young people about the conservation and responsible use of water resources, empowering them to be agents of change and advocates for a sustainable future.

By investing in education and raising awareness among students about the importance of water resources, Vale aims to inspire a new generation of leaders and professionals committed to environmental preservation. We believe that by promoting an integrated and holistic approach to Water Resources in schools, we are empowering young people to understand the challenges and opportunities related to sustainable water management. Moreover, this knowledge can have positive impacts not only on communities near our operations but also on a national and global scale as these students become conscious and engaged citizens in preserving water resources in their future professional and personal roles.

Impact of the engagement and measures of success

We measure the success of our engagement project through various indicators, and one notable outcome is the reduction of waste along the riverbanks. This tangible improvement demonstrates the positive impact of our actions on the environment. By fostering engagement with the society, we aim to create a collective consciousness about the importance of preserving water resources and maintaining a sustainable environment. The commitment and active involvement of the community are crucial for the long-term preservation and well-being of the environment. We believe that through our continuous efforts and collaboration, we can achieve significant positive changes in the quality and health of our rivers, contributing to a better future for all.

At Vale, we recognize that the success of such initiatives goes beyond immediate results. It is about creating a lasting impact that can be seen and felt in the years to come. Our engagement project aims to inspire and mobilize individuals, communities, and stakeholders to take ownership of environmental stewardship. By raising awareness and fostering a sense of responsibility, we empower society to contribute to the preservation and well-being of the environment in the medium and long term. We firmly believe that by working together, we can achieve a sustainable future where our water resources are protected and valued for generations to come.

Type of stakeholder

Other, please specify

academic community

Type of engagement

Innovation & collaboration

Details of engagement

Collaborate with stakeholders on innovations to reduce water impacts in products and services

Rationale for your engagement

The Vale Institute of Technology (ITV) is a leading research institution dedicated to advancing knowledge and innovation in the field of mining and natural resources. One of the key areas of focus for ITV is the prediction and mitigation of water-related risks. Through cutting-edge research and technological advancements, the ITV plays a crucial role in providing valuable insights and solutions to support informed decision-making. By leveraging its expertise and collaborating with internal and external stakeholders, the ITV actively contributes to the identification, assessment, and management of water risks associated with our operations.

The ITV's commitment to research and development enables us to anticipate and address water-related challenges proactively. By conducting comprehensive studies, analyzing data, and applying advanced modeling techniques, the ITV equips decision-makers with the necessary tools and knowledge to effectively predict and mitigate water risks. This proactive approach ensures that we are well-prepared to manage water-related challenges, such as water scarcity, water quality issues, and regulatory compliance. Through its research initiatives, the ITV continues to drive innovation and foster sustainable practices, ultimately contributing to the long-term resilience and responsible stewardship of water resources.

Impact of the engagement and measures of success

The success of our initiative is measured through several key indicators. One such indicator is the number of research projects completed and published throughout the year. This metric reflects the commitment and productivity of our researchers, showcasing the valuable contributions they make to the scientific community and knowledge advancement in the field. Additionally, we assess the success of our initiative by monitoring the number of post-graduate titles granted through the institute's program. This reflects the impact of our research and educational efforts, as well as the

recognition and value placed on the knowledge and expertise generated by the Vale Institute of Technology. By tracking these metrics, we can gauge the effectiveness and relevance of our initiatives, ensuring that we continue to make meaningful contributions to the industry and society.

Type of stakeholder

Other, please specify

academic community

Type of engagement

Innovation & collaboration

Details of engagement

Engage with stakeholders to advocate for policy or regulatory change

Rationale for your engagement

The Vale Institute of Technology (ITV) is at the forefront of research and innovation, actively contributing to the advancement of legislation and regulations related to its areas of expertise. Through its comprehensive research projects, the ITV generates valuable insights and scientific evidence that can inform the development of effective and informed policies. The institute collaborates with regulatory bodies, government agencies, and other stakeholders to share its findings and recommendations, supporting the formulation of evidence-based regulations and standards. By bridging the gap between scientific research and policy development, the ITV plays a vital role in shaping the regulatory landscape and promoting sustainable practices in the mining and natural resources sector.

The institute's multidisciplinary teams work on key topics, such as environmental impact assessments, water resource management, and sustainable mining practices. Through their in-depth studies and data-driven approaches, researchers at the ITV provide valuable insights into best practices and innovative solutions that can enhance the effectiveness and relevance of existing legislation. By collaborating with governmental entities and industry stakeholders, the ITV helps catalyze the development and implementation of regulations that address emerging challenges and ensure the long-term sustainability of mining operations.

Impact of the engagement and measures of success

A key measure of success for the Vale Institute of Technology (ITV) is its collaboration in shaping public policies and regulations that draw upon the valuable information and expertise generated by the institute. By actively engaging with policymakers and regulatory bodies, the ITV contributes to the formulation of evidence-based policies that address pressing environmental and sustainability challenges. The institute's research findings and recommendations are considered in the development of regulations, ensuring that they are informed by the latest scientific knowledge and technological advancements. Through its collaborative approach and knowledge-sharing initiatives, the ITV plays a pivotal role in influencing policy decisions and driving positive change in the industry. By evaluating the extent of its collaboration and the utilization of its research in policy formulation, the ITV measures its impact in fostering the adoption of

sustainable practices and promoting the long-term well-being of the environment and society at large.

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?

No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

	Water-related regulatory violations	Fines, enforcement orders, and/or other penalties	Comment
Row 1	Yes	Fines Enforcement orders or other penalties but none that are considered as significant	These information is from the Company's database of administrative and judicial proceedings. For significant cases, the criteria adopted in GRI 2-27 indicator of the Company's 2022 Integrated Environmental Report were used, as follows: (i) value-based criterion: pecuniary penalty was imposed with a possible and probable prognosis equal to or greater than U$ 1 million (which corresponds to 10% of the maximum amount provided by law for the fine applicable to environmental administrative infractions); (ii) materiality criterion: alleged illicit conduct framed in Environmental Crimes Law (9,605/1998), even if a pecuniary fine less than U$ 1 million has been applied or a non-pecuniary penalty has been applied; and (iii) specifically for non-monetary penalties, all non-monetary penalties imposed in the year covered by the report shall be communicated, except for warnings, which, as expressly provided for in Brazilian environmental legislation. Details in the ESG 2022 Databook.

W2.2a

(W2.2a) Provide the total number and financial value of all water-related fines.

Row 1

Total number of fines

23

Total value of fines

7,981,620

% of total facilities/operations associated

25

Number of fines compared to previous reporting year

Higher

Comment

In 2022, the Company received 23 fines for regulatory violations related to water issues, totaling $7,981,620.85. Although there was an increase in the number of fines received compared to the previous year, only 6 of these fines were considered significant, which is still being discussed at the administrative level.

W2.2b

(W2.2b) Provide details for all significant fines, enforcement orders and/or other penalties for water-related regulatory violations in the reporting year, and your plans for resolving them.

Type of penalty

Fine

Financial impact

1,059,000

Country/Area & River basin

Brazil

Other, please specify

Rio Guandu

Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Notice of Infraction drawn up by the Municipal Department of Environment against Vale, alleging pollution (including the waters surrounding the terminal) caused by the operation of the project. Vale understands that the fine is unjustified and has presented an administrative defense, which is still pending trial. This is also the understanding of the state environmental licensing agency (Inea), which, after being notified of the Notice of Infraction, issued a note stating that the information presented by the Municipal Department of Environment of Mangaratiba is not sufficient to demonstrate the occurrence of an environmental infraction.

Type of penalty

Fine

Financial impact

4,770

Country/Area & River basin

Brazil

Other, please specify

Rio Paraopeba

Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

The fine was issued due to a leakage of approximately 500 liters of diesel oil into the soil, which overflowed from the enclosed area of the groundwater extraction well at Dalgado Farm in Paraopeba. The leakage resulted in impacts on the soil and groundwater. In order to confirm whether the contamination plume extended beyond the excavation area while the excavation was halted, groundwater and soil samples were taken in the capillary fringe surrounding the excavation. After the removal of the saturated soil, in situ tests were conducted on the remaining soil, which indicated no presence of contamination. In a subsequent inspection by the regulatory agency, it was verified that the area in question had already been restored with the replacement of topsoil and a new layer of gravel.

The Company has filed an administrative defense, which is still pending trial. All reported fines are still being discussed at the administrative level.

Type of penalty

Fine

Financial impact

12,879

Country/Area & River basin

Brazil

Other, please specify

Rio Paraopeba

Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

The fine was imposed due to alleged practices of "silting of watercourse due to material transported by DTR 6" and "non-compliance with the execution schedules of the drainage works of the 'south arm' Remanso I", respectively.

In response , the company presented an updated implementation schedule and justified the inherent difficulties that occurred and prevented the deadline from being met. Regarding the siltation process, a semi-mechanized removal alternative has been tested since October 2022, aiming to accelerate the process of desilting in the water source and increasing the safety of employees, since the original process provided for manual removal of sediments.
The administrative defense still pending trial.

Type of penalty

Fine

Financial impact

79,813

Country/Area & River basin

Brazil

Other, please specify

Rio das Velhas

Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Notice of infraction issued due to (i) alleged pumping of effluent with high turbidity and muddy appearance, from the drainage of the Capão Xavier Mine, to the Córrego Seco; and (ii) alleged lack of a water resources use license for the use of dams B6 and B7. We clarify that these occurrences were isolated and resulted from decommissioning works conducted by third-party companies. In response, we implemented an action plan including team training, mapping of sensitive points, daily self-monitoring, and internal effluent management to ensure quality discharge. We are committed to addressing these issues, operating in compliance with regulations, and collaborating with the involved parties. Moreover , although there is no clear requirement for authorization for dams of this type, we have formally submitted a request for authorization of the identified dams to the regulatory agency.

Type of penalty

Fine

Financial impact

33,373

Country/Area & River basin

Brazil

Other, please specify

Rio das Velhas

Type of incident

Other non-compliance with permits, standards, or regulations

Description of penalty, incident, regulatory violation, significance, and resolution

Notice of infraction issued due to the installation of a containment structure downstream in Ribeirão dos Macacos, which contributed to the elevation of the water level in the streams that flow into the dam and consequent flooding in the roads. At the time, Vale stressed the normality of the floods caused by these structures and the inspection carried out by the environmental agency, which did not identify any damage. However, we have implemented corrective measures to ensure that our operations do not have negative impacts on the water resources and the communities around our plants. Additionally, we are continuously improving our water management practices and regularly engaging with local communities and regulatory authorities to stay informed about water-related regulations and to ensure compliance with them.

Type of penalty

Fine

Financial impact

6,299

Country/Area & River basin

Brazil

Other, please specify

Rio das Velhas

Type of incident

Abstraction without a permit or abstraction that exceeded permit

Description of penalty, incident, regulatory violation, significance, and resolution

Notice of infraction issued due to the alleged non-compliance with the deadline for formalization of the process of license for the use of water for underground water collection in tubular wells. As a response, the company presented evidence to the regulatory agency that the license application was filed in a timely manner and is currently awaiting a response from the agency. We are continuously improving our internal processes and procedures related to water licensing and engaging with regulatory authorities to stay informed about water-related regulations and ensure compliance with them.

W3. Procedures

W3.1

(W3.1) Does your organization identify and classify potential water pollutants associated with its activities that could have a detrimental impact on water ecosystems or human health?

	Identification and classification of potential water pollutants	How potential water pollutants are identified and classified
Row 1	Yes, we identify and classify our potential water pollutants	Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates (set by CONAMA 430 in Brazil; Metal and Diamond Mining Effluent Regulations - SOR/2002-222 - in Canada; National Effluent Standard in Japan; Government Regulation No. 82/2001 in Indonesia; National Water Quality Standards in Malaysia; Water Supply and Water Quality Regulations 2016 No. 614 in United Kingdom of Great Britain and Northern Ireland). Vale utilizes meters and data management and monitoring software to perform internal measurements for the purpose of operational control. However, it also relies on certified third-party laboratories for the collection and analysis of samples to ensure compliance with previously mentioned regulatory requirements. Additionally, Vale has an internal normative to identify and manage the acquisition, handling, storage, and disposal of hazardous products, based on standards that include, among others, the American Petroleum Institute. It also addresses preventive and mitigatory controls for failure modes and risk scenarios as well as periodicities of inspection, test and preventive maintenance where hazardous materials are handled, stored or disposed. The definition of a hazardous material is a chemical substance that is classified as a physical hazard material, or a health hazard material, or acute aquatic environment.

W3.1a

(W3.1a) Describe how your organization minimizes the adverse impacts of potential water pollutants on water ecosystems or human health associated with your activities.

Water pollutant category

Inorganic pollutants

Description of water pollutant and potential impacts

Mining activities are susceptible to water pollutants and to handling of inorganic pollutants derived from minerals extracted dependant on the surrounding geological conditions of sites of operation. The minerals present in the ore bodies mined, in the tailings and waste rock can contaminate water sources if not properly managed.

Value chain stage

Direct operations
Product use phase

Actions and procedures to minimize adverse impacts

Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response

Please explain

All of Vale's operational units and projects must have Vale's Water Resources and Effluent Management Program - based on the ICMM guidelines for responsible management of water resources and effluents - documented. The program describes four strategic pillars of action for the responsible management of water resources and effluents at Vale (Governance, Monitoring, Engagement and Risk Management). All of Vale's operations have industrial and sanitary treatment systems, as well as control systems such as dykes and dams, all of which are subject to monitoring and each with its own engaged technical team. The data management includes measurement, monitoring and analysis and goes in accordance with Vale's Internal procedure PNR-00035. Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates. In Brazil, for instance, the guideline and standards for the quality of water resources at a federal level is the CONAMA (National Environment Council) Resolution 430/11. For Canada, Vale follows the Metal and Diamond Mining Effluent Regulations (SOR/2002-222). There is a system for recording and controlling environmental events, which is a requirement for any potential water quality deviation event. This system involves informing quantities/volumes, leak levels, impacted areas, action plan registration with mitigating and contingency measures with nominal responsibilities.

Water pollutant category

Oil

Description of water pollutant and potential impacts

The main activities of the company involving oils are the operation of machinery and vehicles.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response

Please explain

Vale's operations have Waste Disposal Centres where there is classification and separation of waste produced. Our fuelling stations are equipped with containment basins and all tanks and structures with potential for oil leaks have them designed according to relevant standards such as the NBR (Brazilian Technical Standards) 17505 and other standards where applicable. All of Vale's operations have Treatment systems, through industrial and sanitary treatment systems, and specific for oils there are Oily effluent treatment stations. Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates. In Brazil, for instance, the guideline and standards for the quality of water resources at a federal level is the CONAMA (National Environment Council) Resolution 430/11. For Canada, Vale follows the Metal and Diamond Mining Effluent Regulations (SOR/2002-222). There is a system for recording and controlling environmental events, which is a requirement for any potential water quality deviation event. This system involves informing quantities/volumes, leak levels, impacted areas, action plan registration with mitigating and contingency measures with nominal responsibilities.

Water pollutant category

Nitrates

Description of water pollutant and potential impacts

Mining activities are susceptible to water pollutants and to handling of inorganic pollutants derived from minerals extracted dependant on the surrounding geological conditions of sites of operation. The minerals present in the ore bodies mined, in the tailings and waste rock can contaminate water sources if not properly managed.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response

Please explain

All of Vale's operational units and projects must have Vale's Water Resources and Effluent Management Program - based on the ICMM guidelines for responsible management of water resources and effluents - documented. The program describes four strategic pillars of action for the responsible management of water resources and effluents at Vale (Governance, Monitoring, Engagement and Risk Management). All of

Vale's operations have industrial and sanitary treatment systems, as well as control systems such as dykes and dams, all of which are subject to monitoring and each with its own engaged technical team. The data management includes measurement, monitoring and analysis and goes in accordance with Vale's Internal procedure PNR-00035. Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates. In Brazil, for instance, the guideline and standards for the quality of water resources at a federal level is the CONAMA (National Environment Council) Resolution 430/11. For Canada, Vale follows the Metal and Diamond Mining Effluent Regulations (SOR/2002-222). There is a system for recording and controlling environmental events, which is a requirement for any potential water quality deviation event. This system involves informing quantities/volumes, leak levels, impacted areas, action plan registration with mitigating and contingency measures with nominal responsibilities.

Water pollutant category

Phosphates

Description of water pollutant and potential impacts

Mining activities are susceptible to water pollutants and to handling of inorganic pollutants derived from minerals extracted dependant on the surrounding geological conditions of sites of operation. The minerals present in the ore bodies mined, in the tailings and waste rock can contaminate water sources if not properly managed.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response

Please explain

All of Vale's operational units and projects must have Vale's Water Resources and Effluent Management Program - based on the ICMM guidelines for responsible management of water resources and effluents - documented. The program describes four strategic pillars of action for the responsible management of water resources and effluents at Vale (Governance, Monitoring, Engagement and Risk Management). All of Vale's operations have industrial and sanitary treatment systems, as well as control systems such as dykes and dams, all of which are subject to monitoring and each with its own engaged technical team. The data management includes measurement, monitoring and analysis and goes in accordance with Vale's Internal procedure PNR-00035. Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates. In Brazil, for instance, the guideline and standards for the quality of water resources at a federal level is the CONAMA (National Environment Council) Resolution 430/11. For Canada, Vale follows the Metal and Diamond Mining Effluent Regulations (SOR/2002-

222). There is a system for recording and controlling environmental events, which is a requirement for any potential water quality deviation event. This system involves informing quantities/volumes, leak levels, impacted areas, action plan registration with mitigating and contingency measures with nominal responsibilities.

Water pollutant category

Other physical pollutants

Description of water pollutant and potential impacts

Mining activities are susceptible to water pollutants and to handling of inorganic pollutants derived from minerals extracted dependant on the surrounding geological conditions of sites of operation. The minerals present in the ore bodies mined, in the tailings and waste rock can contaminate water sources if not properly managed.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response

Please explain

All of Vale's operational units and projects must have Vale's Water Resources and Effluent Management Program - based on the ICMM guidelines for responsible management of water resources and effluents - documented. The program describes four strategic pillars of action for the responsible management of water resources and effluents at Vale (Governance, Monitoring, Engagement and Risk Management). All of Vale's operations have industrial and sanitary treatment systems, as well as control systems such as dykes and dams, all of which are subject to monitoring and each with its own engaged technical team. The data management includes measurement, monitoring and analysis and goes in accordance with Vale's Internal procedure PNR-00035. Vale monitors and assesses the water and effluent quality indices according to the respective federal regulations and guidelines of each country where it operates. In Brazil, for instance, the guideline and standards for the quality of water resources at a federal level is the CONAMA (National Environment Council) Resolution 430/11. For Canada, Vale follows the Metal and Diamond Mining Effluent Regulations (SOR/2002-222). There is a system for recording and controlling environmental events, which is a requirement for any potential water quality deviation event. This system involves informing quantities/volumes, leak levels, impacted areas, action plan registration with mitigating and contingency measures with nominal responsibilities.

W-MM3.2/W-CO3.2

(W-MM3.2/W-CO3.2) By river basin, what number of active and inactive tailings dams are within your control?

Country/Area & River basin	Number of tailings dams in operation	Number of inactive tailings dams	Comment
Brazil Other, please specify Atlântico Sudeste	7	8	
Brazil Sao Francisco	3	16	
Brazil Tocantins	5	0	
Canada Other, please specify Atlantic Ocean Seaboard; Eastern Placentia and Western St Marys Bays	1	0	
Canada Other, please specify Saskatchewan - Nelson; Central Grass	1	0	
Canada Other, please specify St Lawrence; Dog	0	1	
Canada Other, please specify St Lawrence; Killarney	1	5	
Canada Other, please specify St Lawrence; Vermilion	1	1	
Canada Other, please specify Atlantic Ocean Seaboard; Kogaluk and Notakwanon	1	0	

W-MM3.2a/W-CO3.2a

(W-MM3.2a/W-CO3.2a) Do you evaluate and classify the tailings dams under your control according to the consequences of their failure to human health and ecosystems?

	Evaluation of the consequences of tailings dam failure	Evaluation/Classification guideline(s)	Tailings dams have been classified as 'hazardous' or 'highly hazardous'	Please explain
Row 1	Yes, we evaluate the consequences of	Canadian Dam Association (CDA)	Yes, tailings dams have been classified	Vale's internal Planning, Development and Management standard aims

	tailings dam failure	Ordinance 70.389/17 - Mining National Agency, Brazil Global Industry Standard on Tailings Management (ICMM) Company-specific guidelines	as 'hazardous' or 'highly hazardous' (or equivalent)	to define the methodology and responsibilities in the process of managing and preventing potential risks. It must be reviewed at least once every 3 years and approved by the Executive Committee. The minimum level used by Vale to classify a dam as hazardous is: a significant reversible or irreversible environmental impact beyond the occurrence of the incident. The policy establishes guidelines and commitments for the management of these structures in line with the Quality Management System, the guidelines of best practices that assist in the management of tailings and consider the policies of each country. National Dam Safety Policy, according to Ordinance 70.389/2017 – used for dam structures located in Brazil. The Canadian Dams Association (CDA) documents, for structures located in Canada. As a member of the International Council on Mining and Metals (ICMM), Vale has committed to adopting the guidelines of the International Finance Corporation (IFC). In Brazil Vale has 39 TSFs (Tailing storage facilities) registered with the National Mining Agency (ANM), all covered by Brazil's National Dam Safety Policy, and all are subject to the Regular Safety Inspection Report (RISR)

				every six months.In Canada Vale has 11 TSFs, all of which have publicly reported their performance against the Canadian Mining Association's Towards Sustainable Mining (TSM) program.

W-MM3.2b/W-CO3.2b

(W-MM3.2b/W-CO3.2b) Provide details for all dams classified as 'hazardous' or 'highly hazardous'.

Tailings dam name/identifier

Sul Superior

Country/Area & River basin

Brazil

Other, please specify

Minas Fechadas - Sudeste

Latitude

-19.970176

Longitude

-43.596867

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil

Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

6.02

Planned tailings storage impoundment volume in 5 years (Mm3)

6.02

Please explain

The mine is under Vale's control and is located in the Minas Fechadas - Sudeste Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the

same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

B3/B4

Country/Area & River basin

Brazil

Other, please specify

Paraopeba

Latitude

-20.049122

Longitude

-43.954696

Hazard classification

Highly Hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil

Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

2.69

Planned tailings storage impoundment volume in 5 years (Mm3)

2.69

Please explain

The mine is under Vale’s control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha I

Country/Area & River basin

Brazil

Other, please specify

Paraopeba

Latitude

-20.406063

Longitude

-43.855737

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

12.76

Planned tailings storage impoundment volume in 5 years (Mm3)

12.76

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha II

Country/Area & River basin

Brazil
Other, please specify
Paraopeba

Latitude

-20.408278

Longitude

-43.851811

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

22.78

Planned tailings storage impoundment volume in 5 years (Mm3)

22.78

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha III

Country/Area & River basin

Brazil

Other, please specify

Paraopeba

Latitude

-20.410942

Longitude

-43.83663

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil

Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

19.48

Planned tailings storage impoundment volume in 5 years (Mm3)

19.48

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Grupo

Country/Area & River basin

Brazil

Other, please specify

Paraopeba

Latitude

-20.414798

Longitude

-43.865151

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil

Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

1.25

Planned tailings storage impoundment volume in 5 years (Mm3)

1.25

Please explain

The mine is under Vale’s control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Xingu

Country/Area & River basin

Brazil

Other, please specify

Piracicaba

Latitude

-20.166339

Longitude

-43.484064

Hazard classification

Highly Hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

6.17

Planned tailings storage impoundment volume in 5 years (Mm3)

6.17

Please explain

The mine is under Vale's control and is located in the Mariana Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Área IX

Country/Area & River basin

Brazil
Sao Francisco

Latitude

-20.412253

Longitude

-43.87885

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

0.64

Planned tailings storage impoundment volume in 5 years (Mm3)

0.64

Please explain

The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is in de-characterization and will therefore maintain the volume.

Tailings dam name/identifier

M Area Tailings

Country/Area & River basin

Canada

Other, please specify

St Lawrence; Killarney

Latitude

46.471416

Longitude

-81.140583

Hazard classification

Highly hazardous

Guideline(s) used

Canadian Dam Association (CDA)

Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

58.6

Planned tailings storage impoundment volume in 5 years (Mm3)

58.6

Please explain

The mine is under Vale’s control and is located in the Copper Cliff Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

P Area Tailings

Country/Area & River basin

Canada

Other, please specify

St Lawrence; Killarney

Latitude

46.471416

Longitude

-81.140583

Hazard classification

Highly hazardous

Guideline(s) used

Canadian Dam Association (CDA)
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

59.7

Planned tailings storage impoundment volume in 5 years (Mm3)

59.7

Please explain

The mine is under Vale's control and is located in the Copper Cliff Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

W-MM3.2c/W-CO3.2c

(W-MM3.2c/W-CO3.2c) To manage the potential impacts to human health or water ecosystems associated with the tailings dams in your control, what procedures are in place for all of your dams?

Procedure	Detail of the procedure	Please explain
Assurance program	An assurance program for each phase of the facilities' life that includes the frequency of the various levels of inspections, audits and reviews An assurance program that includes an external audit covering the life of facility or the operating plans	After the rupture of the Brumadinho tailings dam, Vale moved from a management system based on periodic evaluations of the stability conditions of the structures - the Declarations of Stability Conditions of Dams (DCEs) - to a system based on continuous evaluations carried out by third parties (Engineer of Record - EoR) throughout the year. In addition, there are multi-layered reviews, continuous monitoring and support of an updated management system based on best practices – Vale's Tailings and Dams Management System (TDMS), implemented in 2020. These management processes are fully aligned with the new Global Tailings Management Industry Standard (GISTM). The system was finalized in

		2022 and our geotechnical teams have been trained for its use. TDMS includes the provision of independent external reviewers who increase the levels and layers of internal review: EORs, Independent Tailings Review Board (ITRB) and Periodic Independent Dam Safety Reviews (RPSB) that support the internal processes of technical inspections, reviews and performance evaluations. All of Vale's dams in Minas Gerais continue to operate under an independent external audit process, as a result of the agreement signed in 2019 with the Public Ministry of the State of Minas Gerais. As part of the commitment to the implementation of GISTM and our work to eliminate the gaps identified in the 2021 self-assessment, the GISTM 100 Journey program was established in 2022. In December 2022, our internal assessment indicated that we had achieved 90% compliance with GITSM requirements, considering the structures evaluated and their consequence ratings2. The goal is to achieve compliance for all of our tailings storage facilities by 2025. For those classified as 'Extreme' and 'Very High', the target is August 2023.
Operating plan	An operating plan that is aligned with your established acceptable risk levels and critical controls framework An operating plan that includes periodic review of the foundations and slope materials	After the rupture of the Brumadinho tailings dam, Vale moved from a management system based on periodic evaluations of the stability conditions of the structures - the Declarations of Stability Conditions of Dams (DCEs) - to a system based on continuous evaluations carried out by third parties (Engineer of Record - EoR) throughout the year. In addition, there are multi-layered reviews, continuous monitoring and support of an updated management system based on best practices – Vale's Tailings and Dams Management System (TDMS), implemented in 2020. These management processes are fully aligned with the new Global Tailings Management Industry Standard (GISTM). The system was finalized in 2022 and our geotechnical teams have been trained for its use. TDMS includes the provision of independent external reviewers who increase the levels and layers of internal review: EORs, Independent Tailings Review Board (ITRB) and Periodic Independent Dam Safety Reviews (RPSB) that support the internal processes of technical inspections, reviews and performance evaluations. All of Vale's dams in Minas Gerais continue to operate under an independent external audit process, as a result of the agreement signed in 2019 with the Public Ministry of the State of Minas Gerais. As part of the commitment to the implementation of GISTM and our

		work to eliminate the gaps identified in the 2021 self-assessment, the GISTM 100 Journey program was established in 2022. In December 2022, our internal assessment indicated that we had achieved 90% compliance with GITSM requirements, considering the structures evaluated and their consequence ratings2. The goal is to achieve compliance for all of our tailings storage facilities by 2025. For those classified as 'Extreme' and 'Very High', the target is August 2023.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Value chain stage

Direct operations
Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an established enterprise risk management framework

Frequency of assessment

Annually

How far into the future are risks considered?

3 to 6 years

Type of tools and methods used

Tools on the market
Enterprise risk management
International methodologies and standards
Other

Tools and methods used

COSO Enterprise Risk Management Framework
ISO 31000 Risk Management Standard
Internal company methods

Other, please specify

Classification of the level of water stress of the river basins where we operate according to the FAO UN 6.4.2 indicator; Classification of our suppliers as to water risk.

Contextual issues considered

Water availability at a basin/catchment level
Water quality at a basin/catchment level
Stakeholder conflicts concerning water resources at a basin/catchment level
Impact on human health
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats
Access to fully-functioning, safely managed WASH services for all employees

Stakeholders considered

Customers
Employees
Investors
Local communities
NGOs
Regulators
Suppliers
Water utilities at a local level
Other water users at the basin/catchment level

Comment

We have developed an integrated risk management framework, which considers the impact on our business not only of market risk factors, but also of the following risks: inadequate or flawed internal processes, external people, systems or events, risks arising from third-party obligations (credit risk), etc. Vale has also adapted its global internal standard for water and wastewater resources management to the guidelines of the International Council on Mining and Metals ICMM. To assist the Company in the analysis of water risks, as of 2022, we have adopted FAO UN indicator 6.4.2, which classifies the level of water stress in the watershed where we operate. In 2021, our cumulative global result since the base year was a 20% reduction in the specific use of fresh water, exceeding our initial target set for 2030 (10% reduction). We remain focused on reducing the use of fresh water. As a guideline of our Water and Water Resources Policy, when we reach our goal, we must set new goals. We will realize in 2022, through specialized consulting, that all operations will still have reduction targets. The update of the 2030 target will have bolder percentages for units that are in watersheds with higher water levels, because we want to contribute beyond internal processes. In 2022, through specialized consulting, we defined the criteria to implement the strategic network for monitoring surface water quality considering the river basins where we operate. This network will complement the current monitoring, expand the knowledge of the territory, and ensure assertive decision-making. We participate effectively in the watershed committees. These discuss issues of water quality and quantity as well as proposals to resolve conflicts, if any. In 2022, Vale supplied 113

million m³ to companies responsible for public water supply. Vale has been involved with 5 municipalities in the north region of Brazil, developing studies for management, structuring of implementation projects, expansion, restoration, and operation of the water supply system and wastewater collection and treatment, seeking alternatives to increase investment capacity for the purpose of universalizing basic sanitation. Through 2022 the Nature Technical Group was instituted, involving different areas of Vale such as operations and sustainability, with the goal to identify projects and actions the company both has been involved or can be involved that contribute to sustainable development.

W3.3b

(W3.3b) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

	Rationale for approach to risk assessment	Explanation of contextual issues considered	Explanation of stakeholders considered	Decision-making process for risk response
Row 1	Water risks are assessed as part of an established enterprise risk management framework at Vale. This approach to risk considers two levels of assessment: a corporate level, which assesses risks holistically (top-down), and an operational level, which assesses risks in processes and tasks (bottom-up). Vale has a Risk Management Policy for the Vale Group and a standard that requires periodic assessment and monitoring of corporate risks in a consolidated manner in order to ensure that the overall risk level	The integrated risk management framework considers operational risks, geotechnical risks, strategic, financial and cyber risks, compliance risks and sustainability risks. Vale's water risk management actions and initiatives are local and global and involve the review and improvement of governance processes, the establishment of new policies, the application of the HIRA and the updating of the units' master plans, in addition to alignment with the principles established by the ICMM (International Council on Mining and	In 2022, through expert advice, we map and classify the water security risks (physical, regulatory and reputational risks) of our suppliers. The results of the risk assessment are used to assess the impact of Vale's new investments, acquisitions and divestitures, as well as to tailor the Company's risk appetite (which represents how much the company is willing to accept each type of risk) to the needs of its growth plan, strategic planning and business continuity. To date, the company has no history of water risks associated with its suppliers, nor	There are three lines of defense that define the relationship between different areas and hierarchies of the company and their respective scope of responsibilities. The first line includes the operational, business, project, support and administrative areas. These areas are directly responsible for the operation of the assets and for the identification, evaluation, monitoring and management of their risk events in an integrated manner. In the second are the Executive Management of Internal Controls, Risks and Compliance and a second-line specialist of defense. These areas and

	remains in accordance with acceptable corporate risk guidelines. The policy establishes guidelines for the management of water-related risks, using methods such as the UN indicator 6.4.2 for assessing water stress, the COSO Enterprise Risk Management Framework, the ISO 31000 Risk Management Standard and internal company methods. The policy also establishes guidelines for corporate risk management, considering the line-of-defense model and ISO 31000, ISO 55000, COSO ERM Framework and HIRA (Hazard Identification and Risk Analysis) standards, aiming to promote the integrated management of all risks to which Vale is exposed.	Metal). The selection of each contextual theme and stakeholder considered was based on the Bow Tie methodology, which identifies causes, events and impacts that affect our direct operations and other stages of our value chain.	damage to the compromise of its deliveries.	executives oversee and support the work of the first line of defense by providing expertise and instrumentation for risk management. In the third line we have the Compliance Council. Two areas operate: Internal Audit, responsible for independently evaluating the effectiveness of the company's internal controls and risk management; and the Whistleblowing Channel, responsible for receiving, registering and investigating complaints received through an independent channel. Preservation of the anonymity of the whistleblower and guarantee of non-retaliation.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, both in direct operations and the rest of our value chain

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

The company's water dependence remains crucial despite efforts to reduce consumption. Vale invests in reuse initiatives, new technologies, studies, and expanding the Target Water Program. Ensuring water quality and quantity aligns with our commitments stated in the Water Resources Policy. Adequate fresh water availability directly affects Vale's operations, emphasizing its strategic importance.
i) The measure or indicator used to identify substantive changes: The company takes into account the use of water as well as the economic relevance/impact of direct operations. In relation to Vale's water risk management, the impacts on resources, their dependence and the level of water stress of the watersheds where we operate are considered. Vale uses Indicator 6.4.2 of the United Nations 2030 Agenda to assess water stress levels. This indicator is essential to determine the presence of water stress in a given watershed. It is calculated by comparing the total fresh water withdrawn from the watershed with the total water resources available. It is considered that places with high and very high risk of water scarcity are those in which our operations can be significantly affected, so that the water factor could generate a substantial change in Vale's direct operations, which impacts operations and projects and increases conflicts over the need for water. Vale's methodology for managing corporate risks combines information on the frequency and severity of inferred risks to rank them as a priority. Risks are classified into high, medium, or low residual risk. High risks are those that combine high frequency rates (monthly or annual) and high severity values (more than ten million, multiple deaths, environmental damage, penalties, etc.), depending on the combination in the risk matrix. The level of severity depends on the scope and objectives of the risk assessment and the level of effect between the various types of environmental, social, reputational, financial, etc. The probability of the impact is also analyzed based on the historical events and experience of the employees of the respective regions and companies. A Severity and Probability Table is a tool used to determine the extent of an impact. By assembling an analysis of the progressive severity of the impacts with the probability of occurrence of the mapped risks, we obtain the most relevant risks and act to prioritize them. It is also necessary to consider the controls that are already in place or, in the case of projects, that are planned and budgeted. Considering the controls currently implemented, it is also important to verify the residual risk and assess its level of acceptability, defining the need for additional measures. iii) Thresholds used to qualify the magnitude of the financial impact: The financial impacts considered substantive apply to Vale's direct operations and are classified in the planning, development and management standard (NFN-0001) in the following dimensions: –Moderate (higher US$ 100 million - US$ 300 mi); –Serious (higher $300 million - $1 billion); –Critical (higher US$ 1 bi - US$ 3 bi); –Very critical (higher $3 bi) iv) The definition applies to direct operations. An example of substantive financial or strategic impact identified in 2018 concerns water restriction, which can lead to a financial impact of $183.1 million. In addition, another example identified is the presence of groundwater at operating sites, which can be a hindrance, leading to a financial impact of more than $100 million. Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Therefore, we have established a partnership with a specialized consultancy to identify and classify our

suppliers. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. In 2019, the rupture of Dam I of the Córrego do Feijão Mine impacted our strategy and future economic performance. That's why we develop new management approaches to how we define a substantive financial or strategic impact on our business. Although the dam rupture was not caused by water security policies, one of the consequences of the incident is the worsening of water security. As dams are essential for our operations, Vale requires periodic reviews of the physical and hydraulic safety conditions of the dam, carried out by external and independent companies. These revisions meet Brazilian legal requirements and commitments established with Brazilian authorities, such as the Public Prosecutor's Office and the National Mining Agency (ANM). A substantive financial or strategic impact is defined as any event that may cause a negative impact on health, safety, environment, reputation, financial, human rights, and social issues. A substantial financial impact is between 5 - 10% of EBITDA, around US$ 1 billion.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	5	1-25	Until 2021, we used the WRI (World Resource Institute) Aqueduct tool, which assisted in the analysis of Vale's water risks. The tool provides water risk mapping on a global scale to identify the impacts of river flooding due to urban damage, the occurrence of floods and the severity of droughts, and the populations affected by these situations. With it, it is also possible to correlate the water use of our operating units with the degree of risk indicated by the Aqueduct. The accuracy of the databases to generate these global assessments has increased substantially in recent years and is continuously improving, however, it is necessary to verify and complement these assessments considering the knowledge and perceptions of local operational water risks, their possible impacts and mitigation actions In order to continuously improve its water risk assessment, Vale adopted in 2022 Indicator 6.4.2 of the United Nations 2030 Agenda as a base point. This indicator shows whether there is water stress in the analyzed basin. It is calculated from the ratio between the total fresh water withdrawn in the watershed and the total water resources available for use. 5 of the 41 operating units (12%) were identified as exposed to substantive water risk. Because of this change of methodology, there has been an increase of

			facilities identified as exposed to water risks compared to previous year and both facilities identified at risk in the previous year are not included this year (A facility in Mozambique is no longer part of Vale's operation and a facility in Oman was reassessed due to its use of desalination water, which doesn't pose a risk of water stress where it is located). Vale's water risk management actions and initiatives are local and global in nature, and involve the review and improvement of governance processes, establishment of new policies, application of the HIRA and updating of the units' master plans, in addition to alignment with the principles established by the ICMM (International Council on Mining and Metal). In 2020, Vale also and published the Water and Water Resources Policy, which addresses the principles and commitments that will guide Vale's activities. Our commitment was to reduce by 10% the withdrawal of fresh water for use in our production processes by 2030 compared to 2017 as the base year. To achieve this goal, we invested in (a) the expansion of the water monitoring network, (b) in effluent reuse initiatives in the company's processes, (c) in the use of rainwater, (d) in the search for new technologies and (e) in the development of studies for the continuous improvement of the responsible management of water resources, our cumulative overall result since the base year was a reduction of 20%, exceeding the initial target set for 2030 (reduction of 10%). A new target is expected to be released in 2023, aided by the new water risk assessment based on Indicator 6.4.2 of the UN 2030 Agenda. The new goal will expand the scope beyond specific internal uses and consider local aspects related to the availability, quality, access to water and ecological health of the watersheds where we operate. Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes the identified risks, taking into account their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Currently,

			Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

Brazil

Other, please specify

Itacaiunas

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

10,405,465,043

% company's total global revenue that could be affected

21-30

Comment

The assessment based on Indicator 6.4.2 of the United Nations 2030 Agenda, calculated from the ratio between the total fresh water withdrawn in the river basin and the total water resources available for use indicates that this facility is at critical water stress level. The potential financial impact was calculated considering the average price of iron ore as $108.1 per ton and fully closed activities.

Country/Area & River basin

Brazil

Rio Doce

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

2,857,298,428

% company's total global revenue that could be affected

1-10

Comment

The assessment based on Indicator 6.4.2 of the United Nations 2030 Agenda, calculated from the ratio between the total fresh water withdrawn in the river basin and the total water resources available for use indicates that this facility is at Critical water stress level. The potential financial impact was calculated considering the average price of iron ore as $108.1 per ton and fully closed activities.

Country/Area & River basin

Brazil

Rio Doce

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

1,020,512,445

% company's total global revenue that could be affected

1-10

Comment

The assessment based on Indicator 6.4.2 of the United Nations 2030 Agenda, calculated from the ratio between the total fresh water withdrawn in the river basin and the total water resources available for use indicates that this facility is at Critical water stress level. The potential financial impact was calculated considering the average price of iron ore as $108.1 per ton and fully closed activities.

Country/Area & River basin

Brazil

Other, please specify

Rio Piracicaba

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

18,447,788

% company's total global revenue that could be affected

Less than 1%

Comment

The assessment based on Indicator 6.4.2 of the United Nations 2030 Agenda, calculated from the ratio between the total fresh water withdrawn in the river basin and the total water resources available for use indicates that this facility is at High water stress level. The potential financial impact was calculated considering the average price of iron ore as $108.1 per ton and fully closed activities.

Country/Area & River basin

Brazil

Other, please specify

Rio Piracicaba

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

383,652,872

% company's total global revenue that could be affected

1-10

Comment

The assessment based on Indicator 6.4.2 of the United Nations 2030 Agenda, calculated from the ratio between the total fresh water withdrawn in the river basin and the total water resources available for use indicates that this facility is at High water stress level. The potential financial impact was calculated considering the average price of iron ore as $108.1 per ton and fully closed activities.

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Brazil

Other, please specify

All basins In Brazil

Type of risk & Primary risk driver

Acute physical

Rupture of tailings dams and toxic spills

Primary potential impact

Other, please specify

Social, environmental and economic impact.

Company-specific description

Vale has identified and monitored annually risks that may have a significant impact on the company, mainly involving dam structures. Tailings dam failure can spread more than a million cubic meters of tailings over huge areas. Vale operates 140 dams in Brazil, 39 of which are Tailings Storage Facilities, most of them located in Minas Gerais. Of the total, 98 are covered by Brazil's
National Dam Safety Policy. For the 15 structures with active level 1 emergency protocols, Vale intensified its monitoring and signaling of instability, in addition to carrying out studies, actions and complementary works to improve safety, as appropriate. The 8 structures with active emergency protocols at levels 2 and 3 had their respective Self-Rescue Zones evacuated preventively, with the removal and relocation of resident families downstream of the structures (where applicable). In these cases, Vale adopts measures to reinforce the conditions of stability and safety, such as keeping the reservoirs dry, reducing the supply of water and implementing diversion channels. How the identified impact will affect direct operations: Mapping of failure modes and critical controls is performed, as well as risk assessment of the dam portfolio through HIRA (Hazard Identification and Risk Analysis). Vale has intensified preventive, corrective and monitoring actions for our structures. Since 2020, we have reduced by one third (from 35 to 23) the total number of structures at emergency level. established by Brazilian legislation to classify potential risks that could compromise dam safety. By the end of 2022, the emergency level of the B3/B4 dam in Nova Lima, Minas Gerais, was reduced from 3 to 2. This positive step was possible due to the progress of the de-characterization process with the removal of more than 50% of the tailings from the reservoir, improving the stability conditions of the structure. As a precautionary measure, the ANM's Resolution 95 directs that the Self-Rescue Zone (ZAS) must be evacuated at emergency level 2 or higher. This means that the families who have been relocated from the area will not return to the site until it is downgraded to level 1. Tailings removal works will continue to be conducted by remotely operated equipment and the forecast is to complete the de-characterization of the structure by 2025, two years earlier than initially planned.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1,151,000,000

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

The financial impact includes the blocking of resources and the imposition of administrative sanctions, immediate assistance and emergency actions by the company, preliminary agreements and emergency compensation, voluntary financial support to affected families, special support to traditional communities, investment in health professionals and medicines, diverse environmental monitoring, and investments in dam safety and decommissioning. The stated amount of the potential financial impact refers to the potential cost in the event of a dam failure, so the principal impacts in our income statement for the year ended December 31, 2022, were $1.151 billion, including expenses and provisions to meet our obligations related to the de-characterization of our upstream dams and the obligations we assumed in preliminary settlement agreements.

Primary response to risk

Improve monitoring

Description of response

In December 2015, the Geotechnical Risk Management area was created, with a specific focus on dams. In 2016, R$ 109 million were applied to improve dam control. In 2017, R$ 180 million were invested in maintenance services, monitoring, improvement works, audits, risk analysis, revisions of Action Plans for Emergencies of Mining Dams (PAEBM) and warning system implementation. The PAEBM is a technical document filed with the respective municipal government and civil defense agencies (municipal, state and federal), setting out immediate actions to take in the event of an emergency. Vale is responsible for providing regular training sessions, with a maximum interval of 6 months. Evacuation simulations are carried out with the population, and siren system tests are frequently conducted in order to ensure the emergency response efficacy. In 2019, right after the Brumadinho dam collapse, Vale created the Extraordinary Independent Consulting Committees, focusing on Investigation, Support and Recovery, and Dam Safety. The Committees was dedicated to measuring the assistance to those affected by the collapse (Support and Recovery) and to advise on issues related to safety conditions, management, and mitigation of risks related to Vale's dams and dikes

(Dam Safety). The approval of the Emergency Plan for decommissioning upstream dams is contemporaneous to the Committees. In 2022 , Vale maintained its dam management in line with the best and most rigorous international practices, integrated with the movements of society and updated with the advances in legislation. For this reason, we have intensified the monitoring of our structures and the assessments of their conservation status, in order to anticipate the problems through preventive and corrective measures. Vale is focused on the evolution of its Tailings & Dams Management System ("TDMS") for the Ferrous, Coal and Base Metals businesses.

Cost of response

7,537,953,466

Explanation of cost of response

The value reported as cost of response reflects the sum of all costs of reparation paid by Vale, which include:
- Demand projects from affected communities (0.67 billion);
- Income Transfer to the population (0.82 billion);
- Water security projects (0.38 billion)
- Urban mobility (0.91 billion);
- Public service strengthening (0.67 billion);
- Combating Covid-19 (0.28 billion);
- Temporary contracts and refunds (0.058 billion);
- Support structures, audits and independent technical advice (0.13 billion).

Since 2019, Vale has been developing the de-characterization plan for upstream structures was updated in September 2020, based on information and studies on the company's structures, which are continuously updated. The plan considers 29 geotechnical structures, comprising: 14 dams, of which 1 was already de-characterized; 13 dikes, of which 2 were already de-characterized; and 2 drained stacks. To allow de-characterization works under safer conditions and to increase safety in areas downstream of dams, in specific cases, Vale is building containment structures or backup dams. In 2021, we raised our Dam de-characterization provision with more US$ 1,7 bi after we update our estimates considering new engineering and geotechnical solutions including new risk management concepts the use of remotely operated equipment and the reinforcement of containment plans in certain dams. All the plans about water risk are being developed, focusing on maintenance services, monitoring, improvement works, audits, risk analysis, revisions of Action Plans for Emergencies of Mining Dams (PAEBM) and warning system implementation. The response cost is calculated through the FMEA risk analysis.

Since 2021, Vale progressed in the planning for de-characterizing the structures built by the upstream method of the Pontal Dam, in the Itabira Complex in Minas Gerais. Among the projects is the de-characterization of the Minervino and Cordão Nova Vista dikes. Vale is seeking solutions to minimize the involuntary resettlement of families due to project implementation. In 2022, 5 structures were decharacterized, and according to Dams De-characterization Plan, there has been an advance of about 40% in the plan, in line with the forecast to conclude de-characterization of 30 structures until 2035.

The cost of the impact will have to count with the internal infrastructure and its

reconstruction, and also how much the production will be affected by the problem, such as missing water for example

W4.2a

(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Brazil

Other, please specify

All basins of Brazil (where Vale operates)

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Chronic physical

Declining water quality

Primary potential impact

Fines, penalties or enforcement orders

Company-specific description

As a mineral resources company, water for our direct use is fundamental to our operations (mining and refining of minerals and their transformation into products). As our operations represent the first step in the mineral industry value chain, the availability of sufficient amounts of water between our customers and suppliers is important for the continuity of our business. Aware of the risks linked to water scarcity and in line with the guidelines of the International Council on Mining and Metals (ICMM), Vale has a Water and Water Resources Policy, with guidelines for the responsible management of water resources and effluents, including the rational use of water. Vale also has a HSE (Health, Safety and Environment) Guideline for suppliers, which applies to companies engaged in bidding processes or that are already conducting controlled activities that involve service provision. These HSE requirements are mandatory, with compliance subject to Local Legislation, which takes precedence over the former document. Contractors and subcontractors must fully comply with all requirements stated in the HSE Guideline and non-compliance may result in sanctions as further defined in the guidelines.

Vale acknowledges the importance of improving the risk assessment of our suppliers, hence, in 2022, we have established a partnership with a specialized consultancy to map the whole company's suppliers. For that, a criticality matrix was developed, that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes the identified risks, taking into account their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential

risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Potential risks include for example, water availability, conflict over use, water security. Following, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.
Based on the criticality matrix, a supplier engagement strategy is being developed to promote adherence to best practices. This includes adherence to programs such as CDP and transparent reporting in compliance with standards such as GRI.

Timeframe

Current up to one year

Magnitude of potential impact

Unknown

Likelihood

Unknown

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

The potential financial impact has not been measured yet, but in the mapping of our suppliers, we identified those with the highest representation in our expenditure. Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.
Based on the criticality matrix, a supplier engagement strategy is being developed to promote adherence to best practices. This includes adherence to programs such as CDP and transparent reporting in compliance with standards such as GRI.

Primary response to risk

Supplier engagement
Promote greater due diligence among suppliers

Description of response

Mapping of our suppliers through the criticality matrix was the first step in identifying risks within our value chain. We have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Currently, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier. Based on the criticality matrix, a supplier engagement strategy is being developed to promote adherence to best

practices. This includes adherence to programs such as CDP and transparent reporting in compliance with standards such as GRI.

Cost of response

0

Explanation of cost of response

Cost of response not quantified at corporate level

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity

Efficiency

Primary water-related opportunity

Water recovery from sewage management

Company-specific description & strategy to realize opportunity

The main water-dependent activities in mining are hydraulic fracturing, road sprinkling for particulate emission control, equipment washing, material transportation, flotation process, ore washing, gravity concentration, hydrometallurgical and pyrometallurgical processes, and reagent preparation. Among the identified beneficiation stages above, water uses for reagent preparation, the flotation process, and transportation in pipelines require special attention to water quality. For other uses, there is greater flexibility in the quality of water used and a greater possibility of applying treated water, for example, from sanitary effluents. In 2022, Vale conducted a preliminary pilot project to assess the technical and financial viability of substituting fresh water with treated sanitary effluent at a facility in proximity to the city. As part of our efforts, we visited one of the largest treatment plants in Latin America, which specializes in producing water from sanitary effluents and distributing it to various industries. This study was undertaken with the objective of comprehending the underlying business model and exploring the potential for replicating this model in our operational units located in close proximity to urban centres. To ensure sustainable development and the continuity of Vale's operations, especially in water-stressed areas, this opportunity is being evaluated with an initial focus on these regions. Thus, a facility located in the water basin of Rio Doce has been chosen as a case study for the project development. The utilization of treated effluent in this facility has proven capable of substituting some of the fresh water intakes currently used by Vale, contributing to a greater water availability in the region. Additionally, it is

important to note that the municipality's water supply is sourced from the same body of water utilized in Vale's operations. Therefore, the aim is to reduce or eliminate any conflicts regarding water usage, ensuring water security for both the company's operations and the municipal water supply.

Estimated timeframe for realization

4 to 6 years

Magnitude of potential financial impact

Low-medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2,857,298,428

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

The magnitude of the potential financial impact was assessed based on the percentage of the company's total global revenue that may be affected by the discontinuity of operations at the studied facility, estimated at around 6.5%. The estimate for the potential financial impact figure was calculated considering the production value of the metals and mining activities associated with the facility. It considered the production of iron ore in 2022, measured in tons, and the average price of iron ore as US$ 108.1 per ton.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number

Facility 1

Facility name (optional)

Country/Area & River basin

Brazil

Other, please specify

Itacaiúnas River watershed

Latitude

-6.059807

Longitude

-50.167448

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

4,355

Comparison of total withdrawals with previous reporting year

This is our first year of measurement

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

1,145

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

3,210

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

2,501

Comparison of total discharges with previous reporting year

This is our first year of measurement

Discharges to fresh surface water

2,501

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

1,854

Comparison of total consumption with previous reporting year

This is our first year of measurement

Please explain

In Pará, we own the largest mining complex in Brazil, representing the largest private investment ever made in the country in the second decade of the 20th century. Our iron ore production can be found at our Serra Norte, Serra Leste and Serra Sul units. In Serra Norte, in addition to iron, we also produce manganese.
In 2022, the methodology for assessing water stress areas was changed from only the WRI Aqueduct to complement with Indicator 6.4.2. UN of the 2030 Agenda. Beyond the WRI Aqueduct, the UN indicator allows a better regional assessment by classifying water stress with data on catchments and availability for use in the analyzed watershed.

Facility reference number

Facility 2

Facility name (optional)

Country/Area & River basin

Brazil

Other, please specify

Rio Doce Basin

Latitude

-19.627099

Longitude

-43.250624

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

9,040

Comparison of total withdrawals with previous reporting year

This is our first year of measurement

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

7,782

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

1,258

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

172

Comparison of total discharges with previous reporting year

This is our first year of measurement

Discharges to fresh surface water

44

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

128

Total water consumption at this facility (megaliters/year)

8,868

Comparison of total consumption with previous reporting year

This is our first year of measurement

Please explain

In 2022, the methodology for assessing water stress areas was changed from only the WRI Aqueduct to complement with Indicator 6.4.2. UN of the 2030 Agenda. Beyond the WRI Aqueduct, the UN indicator allows a better regional assessment by classifying water stress with data on catchments and availability for use in the analyzed watershed.

Facility reference number

Facility 3

Facility name (optional)

Country/Area & River basin

Brazil

Other, please specify

Rio Doce Basin

Latitude

-20.257595

Longitude

-43.524328

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

1,155

Comparison of total withdrawals with previous reporting year

This is our first year of measurement

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

698

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

457

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

30

Comparison of total discharges with previous reporting year

This is our first year of measurement

Discharges to fresh surface water

30

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

1,125

Comparison of total consumption with previous reporting year

This is our first year of measurement

Please explain

In 2022, the methodology for assessing water stress areas was changed from only the WRI Aqueduct to complement with Indicator 6.4.2. UN of the 2030 Agenda. Beyond the WRI Aqueduct, the UN indicator allows a better regional assessment by classifying water stress with data on catchments and availability for use in the analyzed watershed.

Facility reference number

Facility 4

Facility name (optional)

Country/Area & River basin

Brazil

Other, please specify

Rio Piracicaba

Latitude

-19.946214

Longitude

-43.240519

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

717

Comparison of total withdrawals with previous reporting year

This is our first year of measurement

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

695

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

22

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

2

Comparison of total discharges with previous reporting year

This is our first year of measurement

Discharges to fresh surface water

2

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

715

Comparison of total consumption with previous reporting year

This is our first year of measurement

Please explain

In 2022, the methodology for assessing water stress areas was changed from only the WRI Aqueduct to complement with Indicator 6.4.2. UN of the 2030 Agenda. Beyond the WRI Aqueduct, the UN indicator allows a better regional assessment by classifying water stress with data on catchments and availability for use in the analyzed watershed.

Facility reference number

Facility 5

Facility name (optional)

Country/Area & River basin

Brazil

Other, please specify

Rio Piracicaba Basin

Latitude

-20.125958

Longitude

-43.41633

Located in area with water stress

Yes

Total water withdrawals at this facility (megaliters/year)

286

Comparison of total withdrawals with previous reporting year

This is our first year of measurement

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

97

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

189

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

31

Comparison of total discharges with previous reporting year

This is our first year of measurement

Discharges to fresh surface water

31

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

255

Comparison of total consumption with previous reporting year

This is our first year of measurement

Please explain

In 2022, the methodology for assessing water stress areas was changed from only the WRI Aqueduct to complement with Indicator 6.4.2. UN of the 2030 Agenda. Beyond the WRI Aqueduct, the UN indicator allows a better regional assessment by classifying water stress with data on catchments and availability for use in the analyzed watershed.

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been third party verified?

Water withdrawals – total volumes

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report 2022

Water withdrawals – volume by source

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report 2022

Water withdrawals – quality by standard water quality parameters

% verified

76-100

Verification standard used

The quantitative information reported comes from GRI's performance indicators, also reported in Vale's Integrated Report. in the Integrated Report 2022 was audited by PricewaterhouseCoopers.The scope of this verification covered the Standards and Principles1 of the Global Report Initiative for Sustainability Reports, including the GRI Mining and Metals Industry Disclosures. In addition, we evaluated: (1) a set of Vale self-assessment forms, specially prepared to meet the International Council on Mining & Metals (ICMM) Mining Principles, updated in 2021; (2) The adherence of Vale's Integrated Report to the requirements of the International Framework (IR) of the Integrated Report 2022.

Water discharges – total volumes

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 –

Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report.

Water discharges – volume by destination

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report.

Water discharges – volume by final treatment level

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report.

Water discharges – quality by standard water quality parameters

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report.

Water consumption – total volume

% verified

76-100

Verification standard used

The non-financial information contained in Integrated Report 2022 has been externally verified by PricewaterhouseCoopers based on the limited assurance engagement performed in accordance with Technical Notice CTO 01 - Issuance of Assurance Report Related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on NBC TO 3000 - Assurance Engagements Other than Audit and Review, also issued by the CFC, which is equivalent to the international standard ISAE 3000, issued by the IAASB. The limited assurance engagements also included the analysis of adherence to the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); (2) the provisions of the preparatory basis prepared for the undertaking; 3) the principles of the Integrated Report, according to Guideline CPC 09 – Integrated Report, correlated with the Conceptual Framework The Fundamentals of the Integrated Report, prepared by the International Integrated Reporting Council – IIRC Applicable in the preparation of the information contained in the Integrated Report.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Commitment to align with international frameworks, standards, and widely-recognized water initiatives Commitment to prevent, minimize, and control pollution Commitment to reduce or phase-out hazardous substances Commitment to reduce water withdrawal and/or consumption volumes in direct operations Commitment to safely managed Water, Sanitation and Hygiene (WASH) in the workplace Commitment to safely managed Water, Sanitation and Hygiene (WASH) in local communities Commitment to stakeholder education and capacity building on water security Commitment to water stewardship and/or collective action Commitment to the conservation of freshwater ecosystems Commitments beyond regulatory compliance Reference to company water-related targets	Our water policy aims to establish the principles and commitments of Vale and entities within the Vale system for water resources, to manage them sustainably and responsibly throughout the entire production chain. Its application is for Vale and its wholly owned subsidiaries and must be reproduced by its direct and indirect subsidiaries, in Brazil and in other countries, always respecting the constituent documents and applicable legislation. Its adoption is encouraged in other entities in which Vale has a shareholding, in Brazil and in other countries. The mining sector is essential to provide natural resources that drive economic development and social well-being, with surface and groundwater being a fundamental input present in all stages of mining. The main uses of water in mining are for ore processing, machine cleaning, environmental control, hygiene, and human consumption. Knowing the contour conditions of the watershed is crucial where a mining enterprise will be developed through prior diagnosis and/or specific studies, such as water quality, availability, risks, and opportunities. As a guideline for its actions, Vale has established the 2030 Water Target, which aims to reduce the withdrawal of freshwater for processes per produced ton and is part of the socio-environmental goals voluntarily assumed (Vale's socio-environmental goals are aligned with the SDGs). By the end of 2021, Vale had already exceeded the goal set for 2030, which is why we are developing new goals based on responsible water resource and effluent management, to be published in 2023. To achieve the 2030 Water Target, we have invested in expanding the water monitoring network, in effluent reuse in our processes, in rainwater harvesting, in the search for new technologies, and in the development of studies aimed at continuous improvement of water management considering the watershed where Vale operates, and more specifically in Vale's area of influence, to achieve adherence to the ICMM.

		Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change Other, please specify Description of water-related standards for public procurement	Our actions are guided by the following principles: Principle 1: Actively participate, either directly or through representative entities, in forums related to water resource management in the watershed(s) to discuss water security strategies. Principle 2: Contribute to the preservation of the quantity and quality of surface and groundwater in watersheds and marine areas. Principle 3: Contribute to the continuous improvement of sustainable management and responsible use of water resources.

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual or committee	Responsibilities for water-related issues
Chief Executive Officer (CEO)	As head of the company, The Chief Executive Officer is a position appointed by Vale's Board of Directors and plays a crucial role in shaping the company's strategy and operations. The Board of Directors elects the members of the Executive Board, and the CEO is responsible for submitting the candidates for the Executive Vice-President positions for the Board of Directors' approval. The CEO's duties include preparing and submitting the Company's purpose, strategic guidelines, and strategic plan to the Board of Directors. The strategic guidelines and plan are submitted on annual basis and consider socioenvironmental issues. The CEO is also responsible for the execution of the approved strategic plan besides preparing and submitting the Company's annual and multi-annual budgets to the Board of Directors and executing it. Besides, planning and steering the Company's operations and reporting the Company's economic and financial performance to the Board of Directors, as well as Vale's performance in its sustainability initiatives and producing reports with specific performance indicators are also CEO's responsibilities. Additionally, the CEO also exercises the executive direction of the Company, coordinating and supervising the activities of the other Executive Officers and exerting his best efforts to ensure faithful compliance with the decisions and guidelines laid down by the Board of Directors and the General Meeting. Moreover, Vale's CEO introduced two new strategic pillars for the company: New Pact with Society and Safety and Operational Excellence. The New Pact with Society is consistent with making Vale's operations increasingly sustainable

	which is integral to our business model and our sustainability and includes, among others, targets related to biodiversity, climate change, and water management.
Chief Sustainability Officer (CSO)	The Executive Vice President of Sustainability (EVPS), a position equivalent to the CSO, is a legal representative of the company responsible for day-to-day operations and for the implementation of the general policies and guidelines set forth by the Board of Directors. And EVPS This role has the function of deploying and monitoring advances in the implementation of strategies and policies, in addition to being an agent of internal and external engagement, through actions and dialogue with stakeholders, one of Vale's strategic pillars. The Executive Officer of Sustainability and Institutional Relations is responsible for managing sustainability issues, including water resources. In 2020, the EVPS coordinated the approval by the Board of Directors of the Water and Water Resources Policy. In 2020, Vale also created the Water Resources Forum Water Resources and Effluents Operational Forum that integrates operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way. Meetings take place every two months, with the participation of the operations' Water Resources Coordinators and other professionals. Relevant matters are presented to Vale's top leadership through Performance Meetings and the appropriate Risk Executive Committees. Annually, advances in the management of these topics are presented to the Sustainability Committee. In 2021, this forum became international. Additionally, it's important to highlight that in 2022 Vale started the analysis for shifting some responsibilities related to water resources from the CSO to the CTO starting in 2023.
Board-level committee	Technical Committees advise the Board of Directors in monitoring Vale's activities and, oversee the performance and effectiveness of the enterprise risk management conducted by the Board of Executive Officers. In 2022, the statutory advisory committees were reduced from seven to five and the advisory committees now comprise only members of the Board of Directors. The Sustainability Committee (SC) is one of these technical committees and evaluates Vale's sustainability and innovation strategies, making sure they are considered in the definition of the company's global strategy. Some of the Board-level committee activities are the SC recommend subjects related to sustainability in Vale's strategic planning, which involves evaluating, and proposing changes in the socio-environmental strategies and monitoring its implementation; analyzing matters related to Environmental and Social Sustainability, through specific sessions on climate change, biodiversity, and water resource management; among others. It also assesses and advises on policies within its competence. In 2018, this committee established the global goal of reducing the specific use of new water by 10% through the production of equivalent iron (methodology similar to that of the CDP). The indicator reference was the result of 2017 (0.331 m^3/t feeq), and the goal to be achieved by 2030 (0.297 m^3/t feeq), in line with the 2030 Agenda deadline. However, in 2021, the goal was surpassed (0.265 m^3/tfeeq). Vale hired a consulting firm to define new water goals, with the expectation of

	including issues related to the watersheds where Vale operates and reflecting regional context. In 2022, the methodology for updating the Water 2030 target was presented and validated, defining goals based on governance, monitoring, engagement, and risks in the watersheds where Vale operates and its value chain. The numerical goal will be based on the level of water stress in the regions where Vale operates and will be disclosed in 2023

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - all meetings	Monitoring implementation and performance Monitoring progress towards corporate targets Overseeing acquisitions, mergers, and divestitures Overseeing and guiding public policy engagement Overseeing and guiding scenario analysis Overseeing major capital expenditures Overseeing the setting of corporate targets Overseeing value chain engagement Providing employee incentives Reviewing and guiding annual budgets	The Board of Directors oversees the implementation of policies within the company, including the water policy. To do so, the Board meets almost every month, with 16 meetings realized in 2022, to monitor and evaluate the company's economic and financial performance and deliberate on strategic guidelines and plans (executive committee performance meetings) that discuss sustainability-related issues such as water resources. Additional meetings can be called by the chairman, vice-chairman, or any two directors to discuss water-related issues if necessary. The Board is supported by a Sustainability Committee, comprised of Board members and an external independent advisor, in charge of overseeing Vale's actions. The sustainability Committee advises the Board on sustainability-related issues, including water. The committee works continuously, not only on demand from the Board, and follows an annual calendar. At least two committee members must also be Board members. Among the committee's responsibilities are assisting in defining, evaluating, and monitoring sustainability indicators and proposing improvements (including internal water indicators); evaluating and proposing Vale's adoption or participation in national or international initiatives or agreements related to socio-environmental responsibility issues, as well as monitoring the preparation and disclosure of the integrated report, CDP questionnaire, initiatives and investment proposals from a sustainability and innovation

		Reviewing and guiding business plans Reviewing and guiding corporate responsibility strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing innovation/R&D priorities Setting performance objectives	perspective, and enabling recommendations to the Board of Directors. The committee also monitors the scope and effectiveness of the institutional relations area in dealing with regulatory bodies and other institutional relationships associated with sustainability issues. In 2020, Vale created the Water Resources and Effluents Operational Forum, which brings together operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way. Meetings are held every two months with the participation of water resources coordinators from operations and other professionals. Relevant issues are presented to Vale's senior leadership through performance meetings and executive committees. Annually, progress in managing these issues is presented to the Sustainability Committee. Annual water KPIs, such as water volume, percentage, and water stress level in millions of m^3, are disclosed to the Board of Directors and published in the integrated report. In 2021, a specialized consulting firm was hired to develop a roadmap for setting water-related objectives and goals. The revision of the water security governance model was established according to Vale's lines of defense, from the first line, the operational area, to the last line and defense, which is the Board of Directors.

W6.2d

(W6.2d) Does your organization have at least one board member with competence on water-related issues?

	Board member(s) have competence on water-related issues	Criteria used to assess competence of board member(s) on water-related issues
Row 1	Yes	The Board of Directors, along with the Nomination Committee and specialized international consultancies, updated the important qualifications and experiences that must be represented on the Board as a whole, in light of the business strategy and future needs of Vale. The starting point of the committee's work was the preparation of the competency matrix, developed to meet the present and future objectives of the company and to ensure that the consequences of the critical events in Mariana and Brumadinho were addressed, in 2015 and 2019 respectively. A preliminary competency matrix was

		developed, divided into the following competencies: a) administrative; b) functional; and c) sectoral. For functional competencies, the matrix includes significant experience and knowledge in specific areas such as environmental, social, and governance (ESG), including compliance, preferably in the natural resources industry, with experience in community engagement. After approval of the competency matrix, an evaluation of the current composition of the Board of Directors was conducted, both individually and collectively, to identify the degree of coverage of the competencies listed in the matrix, through questionnaires and interviews with Board members and the company's major shareholders. As a result, Vale's appointed chairman has extensive professional experience in sustainability and ESG, with a leadership role in Brazil and internationally in socio-environmental management of territories, stakeholder engagement (communities and NGOs), climate change mitigation and adaptation, especially regarding forests and agriculture. Taking this into consideration, Vale believes that any member of the Sustainability Committee who is also a Board member has the necessary competency for water-related issues, as they are directly linked to our main products and activities. Besides, the Board comprises 13 members, eight of whom are independent, including the Chairman of the Board, and most of whom have expertise in mining (or related industry), ESG, finance, and cultural transformation.

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)

Chief Executive Officer (CEO)

Water-related responsibilities of this position

Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities
Conducting water-related scenario analysis
Setting water-related corporate targets
Monitoring progress against water-related corporate targets
Managing public policy engagement that may impact water security
Managing value chain engagement on water-related issues
Managing annual budgets relating to water security
Providing water-related employee incentives

Frequency of reporting to the board on water-related issues

More frequently than quarterly

Please explain

The CEO is the highest level in the management position responsible for water. He is below the Board of Directors (BoD) and acts as an interface between the Executive Office, such as the Executive Vice President of Sustainability (position equivalent to the CSO), CRO and the BoD. The CEO is responsible for running the business strategy defined by the BoD, drafting plans and projects, and Vale's operational and financial performance. The CEO is responsible for the entire management of the Vale, therefore he is accountable for water-related R&O. He also takes part in monthly meetings with the participation of the Executive Committee, Directors and Managers which discuss issues related to Sustainability (as water resources) beyond the water KPIs monitoring related to the Water Goal. Some water-related topics reported to the board: definition of a new Water Target; engagement of stakeholders; water KPIs and parameters monitoring; mitigation of water risks; water governance implementation.

Name of the position(s) and/or committee(s)

Chief Sustainability Officer (CSO)

Water-related responsibilities of this position

Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities
Monitoring progress against water-related corporate targets

Frequency of reporting to the board on water-related issues

More frequently than quarterly

Please explain

The executive directors are the company's legal representatives and are responsible for operations and the implementation of the general policies and guidelines set forth by the Board of Directors, and the Executive Vice President of Sustainability (EVPS), a position equivalent to the CSO, in 2020, approved our Water and Water Resources Policy. The EVPS is responsible for managing sustainability issues, including water resources. In 2020 Vale created the Water Resources Forum that integrates operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way, and in 2021 it became international. Meetings occur every two months. The water KPIs (volume and % of water and water stress level) related to the Water Goal are monitored monthly at these performance meetings attended by the CEO, the Executive Committee, Directors and Managers. Note: in 2022 Vale started planning to shift some water responsibilities from the CSO to the CTO.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	In 2020, Vale adopted metrics even more focused on environmental, social and governance (ESG) issues when considering its officers' short- and long-term variable compensation, seeking to strengthen Vale's strategic pillars of Safety & Operational Excellence and the New Pact with Society. The long-term variable compensation is based on shares (Matching and PAV programs). The water theme is being considered in the three-year cycles that will be concluded in 2022 and 2023. In 2022, a noteworthy advance has been in executive variable compensation. In the short term, 30% to 40% of collective targets are linked to non-financial indicators and ESG, while 35% are linked to financial targets. In the long term, the contribution of ESG metrics rose from 20% in 2020 to 25% in 2022. This demonstrates the company's commitment to the future impact of our decisions today.

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Contribution of incentives to the achievement of your organization's water commitments	Please explain
Monetary reward	Corporate executive team Chief Executive Officer (CEO) Chief Financial Officer (CFO) Chief Operating Officer (COO) Chief Purchasing Officer (CPO) Chief Risk Officer (CRO)	Reduction of water withdrawals – direct operations Reduction in water consumption volumes – direct operations Improvements in water efficiency – direct operations Improvements in water efficiency – product use	In 2020, Vale adopted metrics even more focused on environmental, social, and governance (ESG) issues when considering its officers' short- and long-term variable compensation, seeking to strengthen our strategic pillars of Safety & Operational Excellence and the New Pact with Society. The Sustainability metrics are based on the 2030 Commitments that include: (i) reduction of greenhouse gas emissions in line with the Paris Agreement; (ii) 100% clean energy self-generation worldwide; (iii) a 10% reduction in freshwater	As of 2020, part of the long-term variable compensation started to cover water resources goals, which are incorporated into the 10% of the general sustainability goals, contemplating our CEO and executive vice presidents. Within sustainability, we have 5 pillars of the Virtual Shares Plan (VSP) that involve this remuneration, and one of them is water resources. The long-term variable remuneration is based on shares (Matching and VSP

	Chief Sustainability Officer (CSO)		intake; (iv) recovery and protection of 500,000 ha of degraded land beyond Vale's limits; and (v) socioeconomic contribution to health care, education, and income generation. The indicators (environmental and social) are relevant and strategic for Vale as they serve as metrics to assess the sustainability of the different business areas linking the compensation of our employees as our goals, helping the sustainable performance of the Company and the return for its investors. The Sustainability KPI goals program encourages the continuous improvement of the company's performance on material socio-environmental issues and integrates the variable remuneration of all Vale employees and impacts all hierarchical levels, up to the CEO. All of these goals, once defined, are registered and monitored in the Career, Succession and Performance (CSP) system.	programs). The water theme in this program is being considered in the three-year cycles that will be concluded in 2022 and 2023. The indicators chosen, measure the reduction in water withdrawal and consumption, in addition to improving the efficiency of operations and the water conditions in the surroundings of Vale's units.
Non-monetary reward	No one is entitled to these incentives			Vale doesn't have non-monetary rewards. The only incentive that exists is in relation to profit sharing, where if the water target is reached, employees receive a bonus.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, direct engagement with policy makers
Yes, trade associations
Yes, funding research organizations

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

In implementing our strategy, Vale is attentive to international scientific foundations, the regulatory framework and stakeholder expectations. Vale, with the launch of the Water Target in 2018, aligned with the UN's SDGs, has sought to strengthen initiatives focused on governance, monitoring and control, stakeholder engagement, and risk management for the execution of Responsible Water Resources Management in its operational units and respective river basins. The company complies with its quantitative and qualitative monitoring of water resources and effluents, which includes its legal obligations. Vale participates in regulatory discussions with local governments, and also contributes to the development of public policies through participation in public consultations with management bodies and in various engagement forums, such as ICMM,CEBDS,FIEMG,IBRAM, among others. Vale has a Code of Conduct that guides all those who act on Vale's behalf, to make the best decisions in an ethical manner. When an inconsistency is found, anyone who wants to report a case of suspected or actual ethical misconduct may use Vale's Reporting Channel. This process is structured to ensure absolute confidentiality and allows the company to learn about any reported inconsistency and then take appropriate action to resolve it. Appropriate actions will be recommended and implemented depending on the level of inconsistency,including formal feedback,training, suspension,dismissal or other legal measures

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)

2023 Reference Form .pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	11-15	The water-related issues are clearly integrated into the Company's strategy to achieve its long-term objectives, which are: To reduce by 10% the specific use of fresh water withdrawn for our processes by 2030, compared to 2017; Support water accessibility and sewage treatment projects preferably in the communities surrounding the operations; Reduce/eliminate losses; Verify the efficiency of water use of Vale's operations, recording the results in an internal management system and presenting them to the leadership. By the end of 2021, Vale had already exceeded the goal set for 2030. So, in 2022, we kept developing the goal's update based on responsible water resource and effluent management, to be published in 2023. Furthermore, to achieve the 2030 Water Target, in 2022 we have invested in: improvement in water and wastewater resources monitoring system by field instrumentation with on-line data collection integration; development of iterative dashboards to management enhance; maintenance and construction in water and wastewater treatment plant and infrastructure; rainwater system maintenance and improvements; alternative technologies for sprinkle system in mining field, materials pile and access road; research of new technologies and improvements of water management considering the watershed where Vale operates, more specifically in Vale's area of influence, in adherence to the ICMM guidelines. Water-related issues are also related to mine closure and post-closure steps.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	As sustainability is one of Vale's strategic pillars, issues related to water are clearly integrated into the Company's strategy to achieve its long-term objectives, which are addressed below. In July 2018, Vale approved a new organizational sustainability structure with the aim of improving the approach and results of this strategy. Vale is positioned to become a benchmark in sustainability by 2030. Having as one of Vale's priorities voluntary environmental and social strategic investments aligned with the SDG - ONU, Vale defined the Water 2030 Goal discussed in the item above. As the company has set the strategic plan to become a

			benchmark for sustainability, to achieve this goal, significant investments were made in 2022. These investments included studies and the implementation of an enhanced data collection and management system, with improvements in software and collection equipment, including the incorporation of 600 new flow meters. Additionally, specialized software tools were adopted for monitoring action plans related to environmental deviations, managing water-related data, and tracking water-related norms and regulations that impact the company's processes. In addition, the company continued to manage and monitor Governance – Standards and processes (Implement the Water Resources Policy), established the internationalized Water Resources Forum, managed water risk, analyzed water risks and sensitivity to operations, and practiced responsible management strategy.
Financial planning	Yes, water-related issues are integrated	11-15	The topics related to water (listed below) were integrated into Vale's financial planning due to the budget dedicated to water management processes, established within the Company's long-term sustainability strategy. By 2030, Vale plans to spend a total of US$57.4 million which US$10.3 million on water management, water-related capital and operational investments of US$35.6 million and US$11.5 million related to water. Vale has been investing in the so-called "dry processing" integrating water usage and increasing safety in mining. Currently, approximately 70% of Vale's iron ore production is achieved through dry processing. Additionally, the company has announced an investment plan of $2.3 billion between 2020 and 2025 to increase the use of filtration and dry stacking methods to account for 16% of the total production. A magnetic concentration plant for low-grade iron ore is currently under construction at the Vargem Grande mine in Itabirito, developed by Vale itself in partnership with “New Steel” technology. The plant, scheduled to start operations in 2023, does not require water for its operations. In Vargem Grande, the tailings filtration process has been in operation since March, allowing for the stacking of the majority of the material in solid state. Another solution is the use of the natural moisture processing, that reduces water consumption by 93% compared to a conventional iron ore production project.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

9

Anticipated forward trend for CAPEX (+/- % change)

-40

Water-related OPEX (+/- % change)

-73

Anticipated forward trend for OPEX (+/- % change)

0

Please explain

Vale's spending on water in 2022 totalled US$ 26.3 million for OPEX and US$ 47.5 million for CAPEX. In 2021, these amounts were $98.8 million for OPEX and $43.5 million for CAPEX. In the reporting period, there was an increase in CAPEX, mainly driven by the acquisition of assets such as instruments and the implementation of treatment systems, as well as the development of IT tools. These investments reflect our commitment ensuring compliance with environmental standards, and enhancing technological capabilities. On the other hand, we observed a decrease in OPEX, attributed to the divestment of certain operational units. The company's largest OPEX expenses were related to human resources and asset maintenance, studies, research and development projects, training, operation inputs, and indicator monitoring. As for CAPEX, we highlight investments in measurement equipment, implementation of control and treatment systems, and development of IT tools for data management and monitoring.

W7.3

(W7.3) Does your organization use scenario analysis to inform its business strategy?

	Use of scenario analysis	Comment
Row 1	Yes	The analysis of climate-related scenarios allows Vale to identify indicators to monitor the external environment and more quickly recognize changes in scenarios, allowing an agile adaptation to current needs. As the TCFD, in 2021, Vale continued to monitor risk scenarios based on the guidelines of the International Energy Agency (IEA), which are recognized by the sector and have international support. In 2020, we updated our qualitative analysis of

		vulnerabilities and likelihood of climate change-related impacts on some operations, a long-term work, and carried out in parallel with ITV's work on climate projections and by operational areas for adaptation and better management of water resources. For this, a tool proposed by Standard Chartered Bank was used, which indicates on a map the points most likely to be impacted by climate change, such as floods and sea level rise.

W7.3a

(W7.3a) Provide details of the scenario analysis, what water-related outcomes were identified, and how they have influenced your organization's business strategy.

	Type of scenario analysis used	Parameters, assumptions, analytical choices	Description of possible water-related outcomes	Influence on business strategy
Row 1	Climate-related Other, please specify TCFD, IEA, IPCC	In line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), Vale conducted an analysis of the resilience of its strategy through the scenario tool to assess the impacts of public policies, market dynamics, technological development and other risks related to the transition to a low-carbon economy on our portfolio. As the TCFD itself suggests, we chose to use the scenarios of the International Energy Agency (IEA), which are recognized by the industry and have international support. In relation to long-term risks, and in parallel with the work carried out by ITV on climate projections and the work carried out by operational areas to adapt and better manage water resources.	Our commitment was to reduce by 10% the withdrawal of fresh water for use in our production processes by 2030 compared to 2017 as the base year. In 2021, our cumulative global result since the base year was a 20% reduction, exceeding our initial target set for 2030. The analysis of climate-related scenarios allows Vale to identify indicators to monitor the external environment and more quickly recognize changes in scenarios, allowing an agile adaptation to current needs. As the TCFD suggests, in 2021 Vale chose to use the scenarios of the International Energy Agency (IEA). In 2020, Vale updated its qualitative analysis of the vulnerabilities and likelihood of impacts	In 2021 and 2022, the company continued to monitor actions to analyze the resilience of its portfolio in the face of climate change scenarios, based on the scenarios of the International Energy Agency (IEA), which are recognized by the industry and have international support. While the Current Policy Scenario (PSC) and the Declared Policy Scenario (STEPS) illustrate the consequences of ongoing policies and stated commitments, respectively, the Sustainable Development Scenario (SDS) identifies the policies and assumptions needed to achieve the UN Sustainable Development Goals. The company has planned to significantly reduce the use of dams and will invest in solutions to replace wet processing

			related to climate change in some operations, a work focused on the long term, and carried out in parallel with ITV's work on climate projections and by the operational areas for the adaptation and better management of water resources. For this, a tool proposed by Standard Chartered Bank was used, which indicates on a map the points most likely to be impacted by climate change, such as floods and sea level rise. The analysis uses projections based on the IPCC, RCP 2.6, RCP 4.5 and RCP 8.5 scenarios. The results are related to new local patterns of precipitation and sea level rise (ports) and flooding.	with safer and more sustainable processes. This is the case of dry processing, which will reach 70% of our iron ore production by 2024.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, but we are currently exploring water valuation practices

Please explain

We established in 2022, within the Water Thematic Chamber of the Brazilian Business Council for Sustainable Development, the goal of developing a methodology in 2023 to determine the price of water in the industrial sectors. This Chamber brings together professionals responsible for water resources from various companies in Brazil. The methodology to be defined will be based on technical studies, literature review, and will be developed by external consultants who are experts in the field. We understand that the price of water is not merely a quantification of costs related to treatment, maintenance, energy, and personnel. Through this multidisciplinary and comprehensive development, we aim to adopt a solid framework for assessing the price of water and publish the Vale's results in 2024.

W7.5

(W7.5) Do you classify any of your current products and/or services as low water impact?

	Products and/or services classified as low water impact	Definition used to classify low water impact	Please explain
Row 1	Yes	The company's business model presents processes that have interference with water resources. However, Vale has evolved in its processes which are: wet concentration (uses water), dry concentration (uses water, but more economical than the first) and natural humidity and one of the initiatives are the processing of natural humidity, without the use of water, and dry which as for the use of water is more economic that wet concentration. Viable solutions - Dry processing: Compared to dry processing, the technique reduces total water consumption by 93% (on average) and increases productivity due to greater resource savings, lower energy consumption, fewer production phases, less equipment and simpler and safer operation.• In Pará, about 80% of production is already based on dry processing;• The main plant in Carajás (PA) is in the process of conversion for natural moisture. Of the plant's 17 processing lines, 11 are already dry. The remaining 6 wet processing lines will be converted by 2023;• The processing plants in Curionópolis and Canaã dos Carajás (both in Pará) also do not use water to treat ore.	Vale considers dry processing as a product with low water impact, because, compared to the processes of other units, the installation of S11D (which uses dry processing) has a water intensity of 0.0143 m³/t, while in the other units (without dry processing) the average water intensity is 0.1599 m³/t, a 93% difference in water consumption.

W8. Targets

W8.1

(W8.1) Do you have any water-related targets?

Yes

W8.1a

(W8.1a) Indicate whether you have targets relating to water pollution, water withdrawals, WASH, or other water-related categories.

	Target set in this category	Please explain
Water pollution	No, but we plan to within the next two years	We have defined that the new objectives will have goals for governance, monitoring and control, engagement and risks. The goal related to the water quality of the watersheds where we operate is in monitoring and control. By 2025, we have defined that we will have the strategic surface water quality network of the river basins where we operate and we will include quality indicators in the target.
Water withdrawals	No, but we plan to within the next two years	We have defined that the new objectives will have goals for governance, monitoring and control, engagement and risks. The goal related to abstraction is due to the update of the reduction of water use in relation to our productions – a goal published in 2018, but with proposals for a bolder reduction for those operating units located in hydroorgraphic basins that had a high and critical level of water stress (indicator 6.4.2).
Water, Sanitation, and Hygiene (WASH) services	No, but we plan to within the next two years	We have defined that the new objectives will have goals for governance, monitoring and control, engagement and risks. All of Vale's facilities are equipped with adequate WASH services, ensuring the provision of clean water, proper sanitation, and hygiene facilities. We prioritize the health and well-being of our employees, visitors, and the surrounding community, and believe that access to these essential services is crucial. Vale continuously monitor and assess its WASH services to identify areas for improvement.
Other	Yes	

W8.1b

(W8.1b) Provide details of your water-related targets and the progress made.

Target reference number

Target 1

Category of target

Target coverage
Company-wide (direct operations only)

Quantitative metric
Other, please specify
m³/ton

Year target was set
2018

Base year
2017

Base year figure
0.32

Target year
2030

Target year figure
0.29

Reporting year figure
0.25

% of target achieved relative to base year
233.3333333333

Target status in reporting year
Achieved

Please explain
This metric is a crucial component of our sustainability goals, as it measures our progress in reducing water consumption. By monitoring the water intensity per unit of production, we can track our performance and strive for continuous improvement.

Our global sustainability goals are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda. The 2030 Water Target, initiated in 2018, is part of the socio-environmental goals voluntarily assumed by Vale - water reduction of 10.0% of the specific use of Global fresh water (base year 2017. In 2021, the cumulative result exceeded the initial target set (reduction of 10%). Thus, the goal's update is in the validation phase and its disclosure is scheduled for the year 2023. Until this update are established, our operational units are committed to maintaining a consistent level of water resource utilization and striving for further improvements whenever feasible.
In 2022, this indicator calculation methodology has changed. Nowadays, is considered the volume of freshwater used, in cubic meters (m³), per ton of processed ore. This

change is to align with IBRAM guidelines. The calculation is performed for each production unit, providing management with visibility of the indicator in each production category and across the entire company. In 2022, the water intensity in the production of iron ore (Iron) is 0.138 m³/ton. For base metals (Base Metals), it is 1.503 m³/ton. And for pellets (Pellets), it is 0.130 m³/ton. These values contribute to Vale's overall indicator of 0.254 m³/ton. These figures reflect Vale's efforts to enhance water efficiency in our operations and reduce the environmental impact associated with water consumption. Our aim is to align with Target 2030, which outlines our commitment to reducing water intensity and optimizing water usage across our operations.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?

Yes

W9.1a

(W9.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W1 Current state	Water accounting (volumes of water withdrawals, discharges and recycling)	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2021, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2021.
W2 Business impacts	Water-related detrimental impacts experienced by the Company	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2021, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2021.

W4 Risks and opportunities	Number of facilities exposed to water risk	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2021, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2021.
W7 Strategy	Integration of water-related issues into aspects of long-term strategic business plan	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2021, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2021.
W8 Targets	Water-related targets and goals	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2021, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2021.

W10. Plastics

W10.1

(W10.1) Have you mapped where in your value chain plastics are used and/or produced?

	Plastics mapping	Value chain stage	Please explain
Row 1	Yes	Supply chain	Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes

			the identified risks, considering their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Currently, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.

W10.2

(W10.2) Across your value chain, have you assessed the potential environmental and human health impacts of your use and/or production of plastics?

	Impact assessment	Please explain
Row 1	Not assessed – but we plan to within the next two years	Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes the identified risks, taking into account their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and reputational co-responsibility and defining the criticality level for each supplier. Currently, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.

W10.3

(W10.3) Across your value chain, are you exposed to plastics-related risks with the potential to have a substantive financial or strategic impact on your business? If so, provide details.

	Risk exposure	Please explain
Row 1	Not assessed – but we plan to within the next two years	Vale acknowledges the vital role of assessing risks related to our suppliers and other stakeholders in the value chain. Hence, we have established a partnership with a specialized consultancy to identify our suppliers and classify them into categories based on the United Nations Standard Products and Services Code. Subsequently, we created a criticality matrix that encompasses potential ESG impacts, such as those related to water and effluent. This matrix systematically organizes the identified risks, taking into account their probability and potential impact level. Therefore, we have gained a comprehensive understanding of the socio-environmental implications of our supply chain, highlighting the potential risks of legal and

		reputational co-responsibility and defining the criticality level for each supplier. Currently, Vale is developing specific and appropriate management initiatives that align with the criticality classification of each supplier.

W10.4

(W10.4) Do you have plastics-related targets, and if so what type?

	Targets in place	Please explain
Row 1	No – and we do not plan to within the next two years	

W10.5

(W10.5) Indicate whether your organization engages in the following activities.

	Activity applies	Comment
Production of plastic polymers	No	
Production of durable plastic components	No	
Production / commercialization of durable plastic goods (including mixed materials)	No	
Production / commercialization of plastic packaging	No	
Production of goods packaged in plastics	No	
Provision / commercialization of services or goods that use plastic packaging (e.g., retail and food services)	No	

W11. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W11.1

(W11.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1		

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please indicate your consent for CDP to share contact details with the Pacific Institute to support content for its Water Action Hub website.

Yes, CDP may share our Main User contact details with the Pacific Institute

Please confirm below

I have read and accept the applicable Terms