Welcome to your CDP Water Security Questionnaire 2022

W0. Introduction

W0.1

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

PTT Exploration and Production Public Company Limited (PTTEP), a Thai national petroleum exploration and production organization, is a publicly listed company on the Thai stock exchange, and a subsidiary of PTT Public Company Limited, Thailand's national petroleum company. PTTEP's mission is to operate globally to provide reliable energy supply and sustainable value to all stakeholders. Therefore, we set our vision to be an energy partner of choice through competitive performance and innovation for long-term value creations.

Operating under the philosophy and concept of sustainable development, PTTEP strives to provide energy security through continuous growth and competitive returns with low impact on environment and society through responsible operations in response to the stakeholder expectations. PTTEP developed the Sustainable Development Framework as the way of working and strong foundation to support our journey towards sustainability, including to achieve our vision of becoming the "Energy Partner of Choice". The framework comprises of three main components namely: High Performance Organization (HPO) or "Be Smart", Governance, Risk Management and Compliance (GRC) or "Be Good", and Stakeholder Value Creation (SVC) or "Be Responsible". The framework also corresponds with the United Nations Sustainable Development Goals (SDGs). PTTEP is confident that this strong foundation as well as conscious consideration of all stakeholders' interests will enable us to deliver value and foster sustainability for the wider world. (From We to World).

PTTEP has worldwide operations of 47 projects in 15 countries as of 31th, December 2021. The company is engaged in the exploration, extraction, production and development of petroleum products. It produces crude oil, condensate, natural gas and liquefied petroleum gas (LPG). The company is also engaged in petroleum-related businesses, such as jetty, bulk tanks and warehouse management.

W-OG0.1a

(W-OG0.1a) Which business divisions in the oil & gas sector apply to your organization?

Upstream

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, 2021	December 31, 2021

W0.3

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

Malaysia
Myanmar
Thailand

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.

Companies, entities or groups over which operational control is exercised

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	TH0355A10Z04

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	Not very important	Not very important	Company materiality assessment following to GRI guideline shows that water management is not material issue of the company. The assessment was considered importance to PTTEP as well as our stakeholders. In addition, freshwater consumption accounts only 1.02 % of total water withdrawal for PTTEP operations, since seawater is our major water source. This includes both direct operations and our supply chain, e.g. Songkhla petroleum support base who is responsible for providing water supply to some offshore operations, etc. However, PTTEP expected that future freshwater dependency may increase as by 2030, the world may face a 40% global water shortfall as a result of increasing populations along with impact from climate change. Water scarcity affects more than 40% of the global population (World Bank). PTTEP considers reducing the freshwater withdrawal in operations in water stress area e.g. S1, Suphanburi and Sinphuhorm in Thailand and seeks more opportunity in water reuse/recycle. Moreover, estimates of future changes in water availability on a local level through operational risk assessment are conducted at all assets for water availability and included in Enterprise Risk Assessment. PTTEP conducted a scenario analysis of the potential impacts for both current and future scenarios i.e. 2021 and 2030. The overall results indicated that PTTEP is not expecting to experience a high or significant impact from water quality and quantity issues

			based on current locations and production volumes.
Sufficient amounts of recycled, brackish and/or produced water available for use	Not very important	Not very important	Company materiality assessment following to GRI guideline shows that water management is not material issue. The assessment was considered importance to PTTEP as well as our stakeholders. In addition, seawater, generally classified as a renewable resource, is major water source for PTTEP operations, equivalent to 99% of total water consumption. This includes both direct operations and our supply chain, e.g. Songkhla petroleum support base who is responsible for providing water supply to some offshore operations, etc Produced water is an important resource as approximately 63% is reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is discharged overboard or evaporated in compliance with the regulation requirements. However, PTTEP expected that future freshwater dependency may increase as by 2030, the world may face a 40% global water shortfall as a result of increasing populations along with impact from climate change. Water scarcity affects more than 40% of the global population (World Bank). PTTEP considers reducing the freshwater withdrawal in operations in water stress area e.g. S1. Suphanburi and Sinphuhorm in Thailand and seeks more opportunity in water reuse/recycle.

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	7,314,230,000	76,590	95,498.4984984985	The water withdrawal was considered important to PTTEP which seawater is generally classified as a renewable resource, and is the major water source for PTTEP operations, equivalent to

				99% of total water withdrawal which is not different from previous year. PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water withdrawal efficiency will be reduced gradually in the following years.

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?

No

W3. Procedures

W-OG3.1

(W-OG3.1) How does your organization identify and classify potential water pollutants associated with its activities in the oil & gas sector that may have a detrimental impact on water ecosystems or human health?

To provide an overview of the environmental management strategy and requirements, PTTEP developed the Environmental Management Standard as a master document for environment management in accordance with the PTTEP SSHE Management System (SSHE-MS). The main objective of this Standard is to:
- assist PTTEP Assets and Subsidiaries to properly manage the Company environmental aspects and impacts in the environmentally sound management practices which include compliance with the regulations and the Company requirements,
- ensure the effectiveness of mitigation and prevention of the environmental pollution including water pollution, and encourage the continual improvement culture.

As required by PTTEP SSHE MS implementation as well as company risk management and voluntary implementation of ISO14001 for all PTTEP operating assets and petroleum support bases, the potential water pollutant including releasing of all types and forms of pollutant to water and/or sea e.g. wastes, wastewater, chemical substance, produced water and

hydrocarbon liquid from each activity will be identified and assessed thorough all stages of activity both normal and abnormal operations via various tools allowed, e.g. Event tree analysis, Bow tie analysis, etc. Types of water-related impacts on ecosystems and human health, e.g. water withdrawn from and wastewater discharge to sensitive areas probable to impact to ecosystems, etc. caused by potential pollutants were considered.

To provide the detailed practical guidance on water and wastewater management for all stages of business life cycle, the Water Management Guideline is implemented to ensure that water related risks are assessed and mitigations are developed; water and wastewater performance are recorded and reported; water and wastewater targets are set; also water and wastewater are managed with good practices.

Moreover, a procedure Environmental Impact Assessment for Exploration, Production, and Decommissioning is also in place to identify water pollutants which has potential impact to human health and ecosystems of community located nearby our operating assets. The appropriate mitigation measures where the significant level is high or medium for preventing and mitigating environmental impacts as well as establishing monitoring program to ensure the effectiveness of the mitigation measures. The internal and external compliance audits against the defined mitigation measures and monitoring program are also required to identify gaps for further improvements and ensure the completeness of implementation. The identified aspects and impact assessment shall be reviewed and updated in the condition of appearance of new development, new or modified activity/product/service, new law and/or regulation announced, new environmental mitigation measure put in place or achieved. PTTEP issued the Sustainable Development Guideline which outlines PTTEP's commitment and expectation for water related risk management, and the Water Management Guideline which outlines recommended approaches for water supply and wastewater management in operations by conducting water related risk assessment to cover numerous risk scenarios. For example, "wastewater discharges adversely affecting local community health or the local ecology" is one of the root cause scenarios to be assessed. Additional details are provided in topic W3.3.

In addition, we have developed the PTTEP's Sustainable Development Booklet which sets out the expectations and behaviors for sustainable performance for both PTTEP and for any party engaging in business with PTTEP, in order to ensure that we can achieve and sustain our vision. This booklet aims to ensure that all PTTEP employees, subsidiaries, contractors, suppliers and joint venture companies have the same perspective and general understanding of how to apply sustainability concepts in their day-to-day roles across the organization and in interactions with peers and stakeholders.

W-OG3.1a

(W-OG3.1a) For each business division of your organization, describe how your organization minimizes the adverse impacts on water ecosystems or human health of potential water pollutants associated with your oil & gas sector activities.

Potential water pollutant	Business division	Description of water pollutant and potential impacts	Management procedures	Please explain
Hydrocarbons	Upstream	The potential impacts from PTTEP operations that has been identified and assessed since construction, drilling, and production phase of our operation i.e. Spill or leakage of hydrocarbon (HC) liquid, JET A1, diesel oil, during transferring/ offloading or from vessel collision, subsea pipelines rupture/corrosion. Hydrocarbon spill or leakage could be impacted to water ecosystems or human health. Potential impacted parties could be e.g. workers, communities, fishermen, aquatic life, mammals etc. The level of coverage, toxicity, persistence and bioaccumulation could be varied depending on e.g. spill volume, type and characteristic of spilled substance, duration, location,	Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Community/stakeholder engagement Emergency preparedness Other, please specify Loss of Primary Containment Reporting and Reduction Guideline, Spill Response Plan and Spill Management Plan	Normally the approach of management procedures is a company-wide basis, however, an integration of company-wide, river-basin and regional basis also applied for some circumstances. The identified aspects and impact assessment shall be reviewed and updated in the condition of appearance of new development, new or modified activity/product/service, new law and/or regulation announced, new environmental mitigation measure put in place or achieved. The indicated management procedures help mitigate both probability of occurrence and severity of consequence resulting in descending of significant tier of the impact. e.g. compliance with effluent quality standards, measure to prevent spillage leaching and leakages, could provide the preventive barriers to the spill or leak event while community/stakeholder engagement, emergency preparedness and spill

		environmental condition and emergency response and management etc. However, the potential water pollution impact which considered as worst case may raise from the spill or leakage by the asset/project that located in the near-shore area with high environmental sensitivity. The identified impact is considered as substantive impact with moderate likelihood thus, the risks on water ecosystems or human health of potential water pollutants associated with our activity are considered as high.		response plan could mitigate the impact once spill or leakage occurred. The success of this management is measured and evaluated in term of spilled oil and chemicals rate. In 2021, the Company's spilled oil and chemicals was at the rate of 0.02 tonnes per million tonnes of petroleum production which is decreased from the previous years. This is a result of the cause analysis and implementation of site-specific incident prevention campaigns for Spill and Loss of Primary Containment (LOPC). PTTEP performance on spill rate has continuously been kept lower than peers or IOGP average at all times.

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

Coverage

Full

Risk assessment procedure

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

Frequency of assessment

Every three years or more

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

Tools on the market
Enterprise risk management
International methodologies and standards

Tools and methods used

WRI Aqueduct
WWF Water Risk Filter
Enterprise Risk Management
Environmental Impact Assessment
ISO 14001 Environmental Management Standard

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
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered

Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment

Value chain stage

Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of other company-wide risk assessment system

Frequency of assessment

Every three years or more

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

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

Tools and methods used

WRI Aqueduct
Environmental Impact Assessment
Internal company methods
External consultants
Other, please specify
IPIECA Global Water Tool

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
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered

Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment

Petroleum Support Bases (PSB) are identified as our supply chain and included in the assessment.

Value chain stage

Other stages of the value chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as a standalone issue

Frequency of assessment

Every three years or more

How far into the future are risks considered?

More than 6 years

Type of tools and methods used

International methodologies and standards

Tools and methods used

Life Cycle Assessment

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
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered

Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment

PTTEP's sole customer is PTT, which is our mother company included in the assessment.

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.

PTTEP has conducted water risk assessment to assess future potential water related risk on operating assets based on four different scenarios as follows:

Event A: increase in cost of water
Event B: physical water parameters
Event C: increased regulatory controls
Event D: surrounding catchment/water use

To fully address comprehensive water related risk scenarios such as physical risks, regulatory and pricing risk and reputation (i.e. stakeholder conflict) risks, general water information of each country was provided by worldwide accepted water tools. Aqueduct developed by WRI, and the Water Risk Filter developed by WWF incorporate with PTTEP site specific data. Each tool used in the study provides information for different objectives. WRI's Aqueduct provides more in-depth information on water stress (by region) and scenario analysis. In addition, WWF Water Risk Filter provides information related to potential biodiversity impact from water consumption and reputational impact. In 2021 we updated our assessment for physical risk to cover 3 timescales: 2020-2025, medium (2026-2035) and long (2036-2050) term. The outcomes provided by risk assessment can assist PTTEP decision makers on water-related risk identification, quantification of the magnitude of impacts to the PTTEP business if the risks occur at high level, water-related risk mitigation and management plan are required. However, the assessment results show that PTTEP absolutely has moderate and low water-related risks for all assessed timeframe and PTTEP assets and support bases. The water related risks have to be assessed regularly or when having significant change to ensure water related risks are monitored and properly mitigated. Thus, the water-related risks are incorporated into the corporate risk monitoring system to monitor and manage at corporate level.

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, only within our direct operations

W4.1a

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

PTTEP has developed the risks events to be in line with Dow Jones Sustainability Index (DJSI) and Carbon Disclosure Project (CDP) Water Disclosure and knowledge of key water related risks that can affect PTTEP's operations. Each risk event consolidates a number of possible root cause scenarios that may result in a material impact on PTTEP's operations, our stakeholders and supply chains across the various consequence categories outlined in the PTTEP risk matrix (i.e. asset production/property; people; environmental effect/reputation). The identified risk events, potential root cause scenarios and risk matrix consequence categories are summarized as follow:

Event A: PTTEP operations affected by increase in cost of water
Event B: PTTEP operations affected by physical water parameters
Event C: PTTEP operations affected by increased regulatory controls
Event D: PTTEP operations impact on surrounding catchment/water use

In addition, PTTEP developed risk assessment matrix in which risk events are assessed in terms of the likelihood of occurrence and financial consequences of risk event. Five bands of financial risk exposure are defined based on the impact of the risk event to Net Present Value (NPV). PTTEP classifies NPV that generated by the identified risk being more than 200 MMUSD as serious or substantive impact. The definition of financial substantive impact on our business is applied to both direct operations and supply chain, i.e. water suppliers, wastewater disposal processor, etc. However, the result of risk assessment covered both direct operations and supply chain shows that there is impact only to our supply chain but not to our direct operation, according to the definition of our financial substantive impact. An example of substantive impact that had been assessed is, the financial impact of Event C: operations affected by increased regulatory controls in Myanmar asset in 2030 which was considered as substantive impact (200-2000 MMUSD). The estimate financial impact is calculated based on the number of idle operating days. As the financial impact is appeared in 2030 and the likelihood was considered as “possible” thus risk events was classified as moderate risk according to PTTEP Risk Metrix. In response to this result of long-term exposure, the water related risks have to be assessed regularly or when having significant change. To ensure water related risks are monitored and properly mitigated at corporate level, the risks have been included in the corporate risk monitoring system.

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	1	1-25	The facility with the potential to have a substantive financial or strategic impact on our business is Myanmar asset. Following the results of water risk assessment, Myanmar asset shows significant risk related to an increase of regulatory control risk poses the highest threat to the operation in 2030.

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

Myanmar

Irrawaddy

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's global oil & gas production volume that could be affected by these facilities

Less than 1%

% company's total global revenue that could be affected

Less than 1%

Comment

-

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

Myanmar

Other, please specify

Tanintharyi Coastal Basin

Type of risk & Primary risk driver

Regulatory

Increased difficulty in obtaining withdrawals/operations permit

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Myanmar asset operations includes Zawtika Onshore Operation Center (ZOC), Zawtika Metering Station (ZMS), and Thakita Supply Base. This is not included the Zawtika Offshore Production Quarter (ZPQ) which is offshore facility and use seawater for water maker system. The financial impact was identified as the same level over all facilities under Myanmar asset, however, the highest likelihood was from the ZOC where its location is in Tanintharyi Coastal Basin. In case the regulatory becomes stringent (e.g.

higher quality of wastewater discharge to the environment), this will significantly increase the site's operating cost (e.g. upgrade the wastewater treatment system). At the same time, the risk on failure to meet the Standard is considered to be higher than previously, which will result in higher insurance premium. Thus, the risk severity in this case is the summation of an increase of operating cost and insurance premium.

Timeframe

More than 6 years

Magnitude of potential impact

Medium

Likelihood

More likely than not

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

483,671,859

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

The financial impact was calculated based on assumption that the number of idle operating days is accounted when community opposition is occurred. For this event, it is assumed that 10 operating days is interrupted for Myanmar asset, leading to loss of daily revenues from the operations. The impact may be occurred within 10 years as the event is classified as medium term timeframe.

Primary response to risk

Comply with local regulatory requirements

Description of response

Keep improving knowledge of regulatory water approach by engaging with regulators/policymakers and being aware of any change in government/public perceptions on water related issues, stringent regulatory on wastewater discharge and water efficiency standard in order to lessen the impact of stringent regulatory control risk.

Cost of response

0

Explanation of cost of response

Cost for engaging with regulators/policymakers considered insignificant since it already included in manpower cost.

W4.2c

(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	Referring the definition, PTTEP classifies NPV that generated by the identified risk being more than 200 MMUSD as serious or substantive impact. The risk generated from our value chain has been assessed with the financial impact less than the criteria.

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

Improved field recovery factor

Company-specific description & strategy to realize opportunity

With the limitation on global water sources, PTTEP has applied the generated produced water for improving the oil recovery at our oil fields by water flooding system. Water flooding or water injection is where water is injected into the oil field, to increase pressure and thereby stimulate production. To ensure opportunity realization, the target “zero produced water discharge” in Thailand operations was established and applied in focus areas. This target through injection of produced water back into depleted petroleum reservoirs is being closely monitored and annually disclosed to public.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

20,470,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

In 2021, crude oil gained from waterflooding at approx. 1,099 BBL/D with oil price at $51.04/BBL, thus value gain = 20.47 MMUSD/year.

Type of opportunity

Products and services

Primary water-related opportunity

Increased sales of existing products/services

Company-specific description & strategy to realize opportunity

For oil/gas condensate wells which having liquid loading problem (high produced water generated), PTTEP has successfully developed a single point gas lift (SPGL) application to maximize oil production & recovery at the first time for offshore assets by design the SPGL system to adjust gas injection rate which can control liquid rate production. This application provides the most suitable artificial lift method to continue producing oil from liquid loading oil wells and could minimize water production by shutting-off water zone.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

12,632,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

The SPGL could prolong the production period of our offshore oil wells at least 2 years with expected reserved gain at 0.36 MMBBL while total CAPEX is of 0.4 MMUSD. Oil price, and OPEX were estimated at $39.2/BB, $3/BBL respectively. Then the financial impact in term of profit gain = (0.36 x (39.2-3)) - 0.4 = 12.63 MMUSD.

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)

Myanmar Asset

Country/Area & River basin

Myanmar

Other, please specify

Tanintharyi Coastal Basin

Latitude

14.602489

Longitude

97.976571

Located in area with water stress

No

Oil & gas sector business division

Upstream

Total water withdrawals at this facility (megaliters/year)

27.55

Comparison of total withdrawals with previous reporting year

Lower

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

26.8

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0.75

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)

22.04

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

22.04

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)

5.51

Comparison of total consumption with previous reporting year

Lower

Please explain

Myanmar asset operations includes Zawtika Onshore Operation Center (ZOC), Zawtika Metering Station (ZMS), and Thakita Supply Base. This is not included the Zawtika Offshore Production Quarter (ZPQ) which is offshore facility and use seawater for water maker system. The financial impact was identified as the same level over all facilities under Myanmar asset, however, the highest likelihood was from the ZOC where its location is in Tanintharyi Coastal Basin.

Water withdrawal includes both supplied water for domestic use and firefighting system at the facility itself. Therefore, discharged volume at the facility are estimated from water used at the facility (at approx. 80% of water used) only.

In the oil & gas sector, the reporting of water withdrawals volumes typically does not include produced water. To enable comparability, CDP requires all companies to include produced water volumes in their withdrawal's disclosure, in order to have an accurate water balance. However, produced water from PTTEP operations was not considered as freshwater (TDS> 1,000 mg/l) according to GRI 303-3, Water withdrawal (Water and effluent 2018) that defines fresh water as water with TDS≤1,000 mg/l.

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 assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Water withdrawals – volume by source

% verified

76-100

Verification standard used

The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Water withdrawals – quality by standard water quality parameters

% verified

Not verified

Please explain

Water discharges – total volumes

% verified

76-100

Verification standard used

The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Water discharges – volume by destination

% verified

76-100

Verification standard used

The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Water discharges – volume by final treatment level

% verified

76-100

Verification standard used

The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Water discharges – quality by standard water quality parameters

% verified

Not verified

Please explain

Water consumption – total volume

% verified

76-100

Verification standard used

The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

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 Description of water-related performance standards for direct operations Description of water-related standards for procurement Reference to international standards and widely-recognized water initiatives Company water targets and goals	PTTEP had established Sustainable Development (SD) Policy in which a commitment on water resources management to minimize impact to stakeholders is included in Responsible operation principle. The SD Policy is published in SD booklet which is publicly available in PTTEP website. Moreover, international standard of water initiatives, i.e. water risk assessment, company water target & goal, and water reduction initiatives are disclosed in PTTEP website. In addition, water related performance & water stewardship and water related standard for procurement is also published in SD report. PTTEP had also developed Environmental Management Standard which is applied for every assets under PTTEP operational control. Requirement regarding produced and process water discharge control is identified in the Standard. PTTEP had also developed Environmental Performance

		Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to stakeholder awareness and education Commitment to water stewardship and/or collective action Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change	Reporting Procedure (EPS) which is involved in every assets under our operational control. Water withdrawal and discharge are one of the environmental indicators specified in EPS to be monthly reported. Furthermore, PTTEP had issued Water Management Guideline since 2013 and had revised in 2018 in which recommended best practices and methodology are included. Regarding water reduction target, it is set for the asset or facility located in water stress area based on water risk assessment results. In addition, PTTEP has issued PTTEP Human Rights policy which identified Respect the right of individual and human being. PTTEP follows the United Nations Universal Declaration of Human Rights which includes individual rights to an adequate standard of living for health and well-being, i.e. hygiene and sanitation, etc. ...(see more details in attached file) [1]

[1] attachement for CDP Water_W6.1a_2021.docx

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	Please explain
Director on board	CEO is a member of PTTEP's Board of Directors who direct company vision, mission, objective and strategy of business development including sustainability. As a representative of Board of Directors, CEO cascades company direction via top managements through relevant working committees which chaired by CEO. PTTEP has a SSHE Council that is responsible for directing PTTEP's safety, security, health, and environmental issues and management. The SSHE Council committees consist of top management at Executive Vice Presidents (EVPs), operating related Senior Vice Presidents (SVPs) and Chief Executive Officer (CEO) who acts as Chairman. Water reduction target setting and plan are approved by SSHE Council. In addition, Vice Presidents and managers have regularly discussed and collaborated

	with concerning assets depended on the issues occurred.

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 - some meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Reviewing innovation/R&D priorities Setting performance objectives	All water related strategy and relevant policy is oriented by our Board of Director and/or Management Committee who responsibilities will be at least annually reviewed via company performance review and monitoring. However, the related agenda will be additionally reserved once the water related issues, e.g. water strategy and related business plan, acquisition and divestiture, etc. are raised. CEO and top management are responsible for briefing the BoD on that matter. For example, external parties require disclosure of PTTEP's supplementary data and information regarding water related issues, e.g. company performance and target, etc. apart from published report, this issue will be brought to the BoD and/or Management Committee meeting for review and consideration.

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	Experienced in oversight and govern on the water-related risks & opportunities, policy, strategy and management in both organization level and country level. One of our SD strategy and framework is “Ocean for Life” and we also focus on the Ocean Health or Ocean Science improvement in the areas of Thailand offshore where we have operated. However, the onshore operations location that we are operated has no significant issue on water scarcity and water cost in Thailand is quite low compare with GDP. The water-related risk has considered low to medium level. Therefore, it has been reflected in our direction by setting target to have no operation in areas at risk from water scarcity and ensure that there is no impact on the community and water users.

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)

Responsibility

Assessing water-related risks and opportunities
Managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

Quarterly

Please explain

CEO is as a member of PTTEP’s Board of Directors who direct company vision, mission, objective and strategy of business development including sustainability. As a representative of Board of Directors, CEO cascades company direction via top managements through relevant working committees which chaired by CEO. The committee who is responsible for water management is SSHE Council in which the

meeting is held on quarterly basis. The company water related issues, e.g. company water target, etc. that need decision making and endorsement from CEO and top managements will be brought to the Council. The key issues will be summarized and reported by CEO to the Board of Director in annual company's performance review session.

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	-

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	Please explain
Monetary reward	Corporate executive team	Other, please specify Reduction of chemicals & hydrocarbon spill to the environment	PTTEP realizes that release of chemical & hydrocarbon to the environment is a key issue for oil and gas companies, which can have direct financial and environmental impact as well as reputation consequences. It is also a key issue heavily monitored by the public. Therefore, spill intensity reduction has been set as SSHE KPI since 2014. In 2021, KPI was established to include spill intensity reduction as a SSHE KPI which is then cascaded to functional group to the department and then to individual KPI for relevant employees that incentivized through the allocation of their performance bonuses. Spill KPIs in 2021 is to achieve at least 60 % spill intensity reduction comparing to PTTEP 3 years rolling average. Corporate executive team and employers bonuses and salary linked to Spill KPI. 2% salary bonus is given to the Corporate executive management if these targets are achieved by 2021. There are also short-term, quarterly cash rewards evaluated on the progression towards these targets.

Non-monetary reward	Director on board Corporate executive team Chief Executive Officer (CEO)	Supply chain engagement	Since 2017, PTTEP has developed and implemented the Green Procurement Criteria Manual covered the goods and services that still not being included in Thai Green Label Products list and PTTEP has significant proportion of spent on that goods or services. In 2021, PTTEP's green procurement guideline is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmental friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. The impact from Green Procurement is in term of reduction of e.g. resource use (raw material, energy and water), emissions or pollutants, waste, etc in our supply chain. PTTEP received the Green Procurement Certificate 2019 from Thailand Environment Institute (TEI). PTTEP target set at 30% spend of office supplies to be green products and services by 2022. As of 2021, we achieved at 45%, one year ahead of the target.

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, other

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?

PTTEP has community engagement projects which have been conducted on a monthly basis. Participants consist of community leaders, government agencies, and PTTEP representatives. Environmental-related issues as well as water management have been brought into discussion. It includes engagement at local operations which is guided by the Issue and Stakeholder Management Guideline. In addition, our Environmental Impact Assessment process establishes meetings with government agencies and water-related experts in e.g. hydrology, aquatic ecology and water pollution, to clarify and discuss on environmental concerns including

water related issues. The mitigation measures and monitoring programs are the outcome to be implemented and complied with over the entire project development.

This also includes the integrated watershed management initiatives in locations with key operations since 2016 i.e. PTTEP1, S1 and Sinphuhorm projects which located in the water stress area. The project aims at improvement of both quality and quantity of the surface water sourced for water supply in the municipalities to prevent water shortage in dry season. In 2021, we continue supporting the projects for Water Resource Conservation, Water Bank project in cooperation with Agricultural Land Reform Office, Forest Fire Prevention & Protection project to reserve the watershed area, and Mini Farm project to promote the agricultural farming with lower water consumption.

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)

56-1 One Report 2021_EN_04.pdf

See detail on item 3.3 in pdf page 111 of 56-1 one report/Annual Report 2021 and our website: https://www.pttep.com/en/Sustainabledevelopment/Stakeholdervaluecreation/Environmentalmanagement.aspx for topic" Water Risk Management".

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	5-10	Aiming at alignment with SDG, PTTEP set environmental management strategic roadmap which water management is also incorporated into the roadmap. Thus, the business strategy has been changed to be more focused on doing business responsibly by mitigating environmental impacts, reducing our water used in operations, aspiring to become a low environmental footprint organization, as well as continuous monitoring risks arising from global water shortage. The maximum time horizon is considered at 2030.

Strategy for achieving long-term objectives	Yes, water-related issues are integrated	5-10	In accordance with our environmental management strategic roadmap, water management guideline has been developed to provides basic guidance on water related risk assessment and development of its mitigation; water and wastewater performance reporting; water and wastewater target setting; and also water and wastewater management good practices. Moreover, the water related risks have been monitored annually via the company-wide risk assessment system which have been assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. The maximum time horizon is considered at 2030.
Financial planning	Yes, water-related issues are integrated	5-10	PTTEP prepares readiness to global water shortage as a result of increasing population and impact from climate change, therefore, water related risks of the company were re-assessed in 2017, 2018 and 2020 . The assessment considers in the events of: - A: PTTEP operations affected by increase in cost of water - B: PTTEP operations affected by physical water parameters - C: PTTEP operations affected by increased regulatory controls - D: PTTEP operations impact on surrounding catchment/water use The risks from the events considered above may impact to our operations and could be influent to our financial planning. However, the assessment results show that PTTEP entirely has moderate to low water related risks for all assessed timeframe and PTTEP assets. It is required that we should have alternative planning in case that existing facilities are not able to perform its normal operation. Moreover, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. The maximum time horizon is considered at 2030.

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)

11.56

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

51.89

Water-related OPEX (+/- % change)

6.46

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

65.24

Please explain

In 2021, PTTEP extracted water-related expenditures from our system for reporting the Environmental Performance (EPS) which each asset reported its expenditure relating to environment separated in CAPEX/OPEX categories. Increasing of the CAPEX/OPEX is as a result of our improvement and development in the environmental cost allocation criteria. It is expected that the expenditure both CAPEX and OPEX in next year reporting will be increased as a recovery from Oil Price War and COVID-19 situation.

W7.3

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

	Use of scenario analysis	Comment
Row 1	Yes	From PTTEP assessment results, PTTEP entirely has moderate and low water related risks for all assessed timeframe and PTTEP assets. However, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. Thus, our strategy is to have no operation in areas at risk from water scarcity and ensure that there is no impact on the community and water users. Moreover, we initiated the "Ocean for Life" strategy to conserve and rehabilitate marine resources and marine ecosystems to increase biodiversity for the

		balance and abundance of Thai seas as well as the income and quality of life. PTTEP also places an emphasis on re-injecting 100% of produced water into oil and gas reservoirs. We have honored international standards, complied with applicable laws, and in some countries exceeded minimum legal requirements.

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	Water-related Climate-related	Climate-related scenarios and models applied by RCP 2.6, RCP 4.5, RCP 8.5 and IEA Sustainable Development Scenario. Water-related considered in the 4 events (as presented in W4.1a)	The climate-related scenario analysis demonstrated that the current climate projection data does not present a significant number of risks to PTTEP's assets. There were no risks identified with the majority of risks in 2030 and 2050 the business. This is largely due to the existing design tolerances built into the PTTEP design basis that can accommodate most of the projected changes in key climate variables. However, the study also identified a number of risk aspects that could not be adequately assessed due to the current uncertainties in key climate variables. Most of the extreme event climate variables, including changes	In accordance with the climate-related scenario analysis result were no risks identified with the majority of risks in 2030 and 2050 the business. PTTEP still need to continue monitoring of the projections and re-evaluation of the risk profile and management actions once detailed projections become available regarding these key climate variables. PTTEP also need to monitor changes in identified regulatory and market risk aspects. PTTEP, like many oil and gas companies, could be significantly impacted by changes in government policy and market developments over the next 10 years and beyond as the global community responds

			in cyclone intensity, swell, wind speed and extreme precipitation and temperature events are currently uncertain with further research being undertaken across the scientific community. The lack of data pertaining to these variables is significant for PTTEP as many of the currently uncertain climate variables present the highest potential impacts for PTTEP. The water-related assessment outcomes as presented in W4.1a	to climate change. This aspect of climate adaptation planning requires ongoing review and multiple response strategies due to the unpredictability of both regulatory and market responses. The water-related assessment results show that PTTEP entirely has moderate and low water related risks for all assessed in 2017, 2018 and 2020, and PTTEP assets. However, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated.

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

As the location that we are operated has no significant issue on water scarcity and water cost in Thailand is quite low compare with GDP.

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	Definition used to classify low water impact	Please explain

	low water impact		
Row 1	Yes	The classification considered by the operations in assets with “non-water stress area” and/or low water risk. We can also calculate the % production portion from the assets that operating in “non-water stress area” and/or low water risk to show PTTEP performance.	As of 2021, 90% of total production is from the assets that operating in “non-water stress area” and/or low water risk.

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Business level specific targets and/or goals Activity level specific targets and/or goals Site/facility specific targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	One of the best practices of oil and gas upstream business that present good citizen and responsibility to environment is whole produced water generated is reinjected into underground reservoir. Therefore, PTTEP has applied this best practice to be our ultimate goal. The volume of produced water reinjected will be daily monitored and annually disclosed to public. However, some facilities where cannot implement this best practice due to specific concerns, e.g. safety issues, lack of appropriate reservoir condition, etc. will follow and comply with local regulation. In addition, water intensity reduction target was established in the facilities located in water stress area. The water reduction performance against target is annually monitored and disclosed to public. Moreover, to monitoring the targets and goals, PTTEP has system for reporting of Environmental Performance (EPS) in place which is involved in every asset under our operational control. Water withdrawal and discharge are one of the environmental indicators specified in EPS to be monthly reported and monitored at corporate level. Furthermore, PTTEP had issued Water Management Guideline since 2013 in which recommended best practices and methodology are included.

W8.1a

(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.

Target reference number

Target 1

Category of target

Water discharge

Level

Company-wide

Primary motivation

Recommended sector best practice

Description of target

Department of Mineral Fuels, as regulator for Thailand Oil & Gas industry, has recommended on produced water management to promote the sector best practice by reinjection method since 2009. PTTEP as the good corporate, has adopted this recommendation as a corporate target not only for Thailand projects but also seek opportunity to implement in other projects in countries where we operate. This is a company-wide goal.

Quantitative metric

Other, please specify

Zero produced water discharge

Baseline year

2009

Start year

2009

Target year

2030

% of target achieved

99.95

Please explain

The volume of produced water generated and discharged is daily monitored and reported monthly via our web-based performance reporting system. Currently in 2021, 99.95% produced water from Thailand assets was re-injected into underground reservoir, whereas 0.05% were treated by evaporation method according to regulation requirements. For the international assets e.g. Myanmar and Malaysia where the national regulation allows to discharge produced water overboard, they are under

conducting the feasibility study to comply with this target at zero produced water discharge.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal

Engagement with suppliers to help them improve water stewardship

Level

Company-wide

Motivation

Reduced environmental impact

Description of goal

PTTEP has in place the PTTEP Vendor Sustainable Code of Conduct which governs the conduct of vendors on issues relating to their business operations and ethics, human rights, occupational health and safety, as well as environmental expectations. The company also developed a PTTEP Green Procurement Roadmap and set the goal to increase the green procurement to 30% of total spending by 2022. To achieve this goal, we developed the “Green Procurement Criteria” for each of the work categories, which were then certified by the Thailand Environment Institute (TEI), and also developed an approach to evaluate the environmental considerations of procurement practices.

Baseline year

2018

Start year

2018

End year

2022

Progress

This target has been annually monitored by responsible party and reported to relevant top management. In addition, the achievement of the engagement measures in term of number of suppliers implemented the criteria and % of total procurement spent in green products/services.
In 2021, over 45% of total spent in green products or services supply.

W9. Verification

W9.1

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

No, but we are actively considering verifying within the next two years

W10. 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.

W10.1

(W10.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	Chief Executive Officer	Chief Executive Officer (CEO)

W10.2

(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

No

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 confirm below

I have read and accept the applicable Terms