

## Welcome to your CDP Water Security Questionnaire 2020

### W0. Introduction

#### W0.1

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

MEG is an energy company focused on sustainable in situ thermal oil production in the southern Athabasca region of Alberta, Canada. MEG is actively developing innovative enhanced oil recovery projects that utilize SAGD extraction methods to improve the responsible recovery of oil as well as lower carbon emissions. MEG transports and sells Access Western Blend (AWB) to refiners throughout North America and internationally. MEG owns a 100% working interest in over 700 square miles of mineral leases. In the GLJ Report, which is dated effective December 31, 2019 with a preparation date of January 15, 2020, GLJ estimated 2.1 billion barrels of gross proved plus probable reserves at the Christina Lake Project, where MEG has regulatory approval in place for 210,000 bbls/d of production. To date, MEG has developed production capacity of approximately 100,000 bbls/d at its Christina Lake Project through the implementation of three major projects (described below) as well as low-cost debottlenecking and expansion projects and the application of its proprietary reservoir technologies. The average annual production decline rate at the Christina Lake Project is approximately 10% to 15% and at current productive capacity MEG has a proved plus probable (2P) reserve life index of approximately 60 years. 2019 bitumen production averaged 93,082 bbls/d. On May 4, 2020 MEG suspended full year 2020 production guidance due to the global crude oil price environment at that time, which was experiencing multi-decade lows coupled with extreme levels of volatility driven by the unprecedented demand shock due to COVID-19. Since that time, crude oil price levels and volatility have stabilized to a level that allowed MEG to re-instate 2020 full year production guidance which is now targeted at 78,000 – 80,000 bbls/d. Compared to the original guidance of 94,000 – 97,000 bbls/d announced November 21, 2019, approximately half of the difference is due to the impact of the scheduled 70-day major turnaround at the Christina Lake Phase 1 and 2 facilities announced May 4, 2020. The remainder of the difference results from a combination of weather-related production impacts in the first quarter of 2020, voluntary price-related production curtailments in the second quarter of 2020 and the impact of reduced well capital throughout 2020. Despite the recent reduction to guidance, over time MEG has been consistently able to realize production growth at the Christina Lake Project while minimizing GHG emissions through the use of cogeneration technologies and the application of its proprietary technologies. Cogeneration, also known as combined heat and power generation, is used to create steam and power from a single heat source. MEG's eMSAGP technology, which involves co-injecting a non-condensable gas into the reservoir with steam, reduces the amount of steam required to produce a barrel of bitumen. Furthermore,



MEG continues to test its proprietary eMVAPEX technology at the Christina Lake Project, which involves the targeted injection of light hydrocarbons in replacement of steam. The application of eMSAGP and cogeneration have enabled MEG to lower its GHG intensity approximately 20% below the in situ industry average calculated based on data reported to Environment Canada, the Alberta Energy Regulator and the Alberta Electric System Operator. By applying the eMSAGP process to significant portions of the Christina Lake Project, MEG achieved an average steam oil ratio of 2.2 in 2019 compared to the in situ industry average of 3.1. MEG delivers its production to market via a long-term transportation services agreement on the Access Pipeline which connects to the Edmonton, Alberta sales hub and via additional pipelines, storage facilities and rail infrastructure to transport, store and sell AWB to refiners throughout North America and internationally. MEG has 100,000 of AWB transportation capacity on the Flanagan South and Seaway pipeline systems providing pipeline transportation directly to U.S. Gulf Coast refineries and export terminals. MEG is also a shipper on the Trans Mountain Expansion Project which, when in service, will provide MEG with 20,000 bbls/d of committed tidewater access for AWB on Canada’s West Coast. MEG has also contracted 30,000 bbls/d of rail transloading capacity and storage capacity of 2.8 million barrels in Alberta and strategic locations in the U.S., with marine export capacity associated with certain U.S. Gulf Coast terminals. This combination of pipeline access, rail capacity, storage capacity and marine export capacity advances MEG’s strategy of having long-term and reliable market access to world oil prices for its production.

## 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, 2019	December 31, 2019

## W0.3

**(W0.3) Select the countries/areas for which you will be supplying data.**

Canada



## W0.4

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

CAD

## 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

## 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	The availability of non-saline water could impact MEG's operating results and domestic water supply. The primary use of water is steam production which consists of produced water and make-up water. Approximately 90% of the water used for steam is recycled produced water while the remaining 10% is make-up water. Produced water is composed of injected steam



			<p>and water from the reservoir. Make-up water sources include saline and non-saline deep groundwater from hydrocarbon-bearing-formations that are unsuitable for human or agriculture use. Under the Alberta Water (Ministerial) Regulation, saline (brackish) groundwater is water that has total dissolved solids (TDS) &gt; 4000 mg/L. Non-saline (freshwater) has TDS &lt; 4000 mg/L. The secondary uses of non-saline water include 1) the withdrawal of shallow non-saline groundwater for domestic water supply providing drinking and hygiene services to operations and 2) the withdrawal of surface non-saline water for industrial purposes such as constructing ice roads, dust suppression and exploration and development drilling activities. The direct use importance rating is considered “important”: MEG’s operations require a small proportion of non-saline make-up water, MEG currently operates in an area with non-saline aquifers with adequate supply, and facility changes could be made to reduce the need for non-saline water. MEG does not currently operate in water stressed areas (WRI Aqueduct tool). Future dependency is anticipated to decrease as reservoir technology development and optimization projects reduce water use intensities. In terms of indirect use, sufficient amounts of water available for use is considered important to MEG’s supply chain. The primary indirect use in the supply chain of good quality non-saline is for refining purposes. Potential water quality or quantity issues could impact refining capacity of refineries purchasing MEG products. The indirect future dependency is anticipated to remain then same.</p>
<p>Sufficient amounts of recycled, brackish and/or produced water available for use</p>	<p>Important</p>	<p>Important</p>	<p>The availability of saline and produced water could impact MEG’s operating results. The primary use of water is steam production in our operations which consists of produced water and make-up water. Approximately 90% of the water used for steam is recycled produced water while the remainder 10% is make-up water. Produced water is composed of injected steam and water from the reservoir. Produced water is essentially a by-product of MEG’s process. Make-up water sources include saline and non-saline deep groundwater from hydrocarbon-bearing-formations that are unsuitable for human or agriculture use. Under the Alberta Water (Ministerial) Regulation, saline (brackish) groundwater is water that has total dissolved solids (TDS) &gt; 4000 mg/L. Non-saline (freshwater) has TDS &lt; 4000 mg/L. MEG does not use any water from streams, rivers or lakes in its thermal operations. The current</p>



		<p>importance rating for produced and non-saline water is considered “important”. An insufficient supply of produced water would impact MEG’s ability to generate steam and produce bitumen however other water sources could be accessed. The future dependency is anticipated to decrease as reservoir technology development optimization projects reduce water use intensities. Additionally, MEG currently operates in the Athabasca River Basin (Mackenzie River Basin sub-basin) where the overall water risk is Low to Medium Risk (1-2) as classified by the WRI Aqueduct tool. Therefore MEG does not currently operate in water stressed areas. In terms of indirect use, sufficient amounts of these water sources available for use is considered important to MEG’s supply chain. The primary indirect use in the supply chain of brackish and/or produced water is for refining purposes. Potential water quality or quantity issues could impact refining capacity of refineries purchasing MEG products. The indirect future dependency of these water sources is anticipated to remain then same.</p>
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## W1.2

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

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	<p>MEG is required to measure the volume of all water withdrawals at its operations which are regulated by the Alberta Energy Regulator (AER) and Alberta Environment &amp; Parks (AEP). Various approvals under the Environment Protection and Enhancement Act (EPEA), AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Measurement methods include metering as per AER Directives 17 and 42. Measurement and reporting are conducted on various frequencies including continuous, daily, monthly, or annually depending on the source or activity. Water Act licenses include requirements for production rate, volume, water level and quality and reporting. Surface water diversion is measured by the pump rate and truck capacity. Groundwater monitoring programs are in</p>

		place to monitor usage and quality. Water quality monitoring is conducted at CLRP for parameters (hardness, pH, chloride etc.).
Water withdrawals – volumes by source	100%	MEG is required to monitor the volume of water withdrawals from all sources which are regulated by the AER and Alberta AEP. Various approvals under the Environment Protection and Enhancement Act (EPEA), AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Measurement methods include metering as per AER Directives 17 and 42. Measurement and reporting are conducted on various frequencies including continuous, daily, monthly, or annually depending on the source or activity. Water Act licenses include requirements for production rate, volume, water level and quality and reporting. Surface water diversion is measured by the pump rate and truck capacity. Groundwater monitoring programs are in place to monitor usage and quality. Water quality monitoring is also conducted at the CLRP facility for parameters (hardness, pH, chloride etc.).
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	100%	Produced water (withdrawal and injection) is regulated by the AER and AEP. Various approvals under the Environment Protection and Enhancement Act (EPEA), AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Measurement methods include metering as per AER Directives 17 and 42. Water Act licenses include requirements for production rate, volume, water level and quality and reporting. Produced water from emulsion production is separated. Produced water heading to the facility is continuously metered using magnetic and ultrasonic flow meters. Readings are monitored daily. Meters are calibrated in on an annual basis. Regular water quality monitoring is also conducted at the CLRP facility for various parameters (hardness, pH, turbidity etc.) to ensure water meets criteria for steam generation.
Water withdrawals quality	100%	Water withdrawal quality is regulated by the AER and AEP Various approvals under the Environment Protection and Enhancement Act (EPEA), AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Measurement methods include metering as



		<p>per AER Directives 17 and 42. Measurement and reporting are conducted on various frequencies including continuous, daily, monthly, or annually depending on the source or activity. Water Act licenses include requirements for production rate, volume, water level and quality and reporting. Surface water diversion is measured by the pump rate and truck capacity. Groundwater monitoring programs are in place to monitor usage and quality. Water quality monitoring is also conducted at CLRP for parameters (hardness, pH, chloride etc.). Water in the potable water treatment plant is analyzed daily for parameters such as iron, chlorine, pH, and turbidity etc.</p>
Water discharges – total volumes	100%	<p>Water discharge is regulated by the AER and AEP. Monitoring and measuring requirements are outlined in various EPEA approvals, AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Facility disposal water is collected in a series of collection tanks, all of which have continuous outlet measurement. Readings from these devices are monitored. Wastewater from the facility is directed to a series of disposal wells which are instrumented with a flow meter, pressure gauge and temperature gauge and are monitored continuously. Wastewater influent (includes all grey water and sewage) is collected into holding tanks and then hauled to the Wastewater Treatment Plant (WWTP) for processing. This wastewater is treated and released to an effluent field. Effluent is metered leaving the WWTP.</p>
Water discharges – volumes by destination	100%	<p>Water discharge is regulated by the AER and AEP. Monitoring and measuring requirements are outlined in various EPEA approvals, AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Facility disposal water is collected in a series of collection tanks, all of which have continuous outlet measurement. Readings from these devices are monitored. Wastewater from the facility is directed to a series of disposal wells which are instrumented with a flow meter, pressure gauge and temperature gauge and are monitored continuously. Wastewater influent (includes all grey water and sewage) is collected into holding tanks and then hauled to the Wastewater Treatment Plant (WWTP) for processing.</p>



		This wastewater is treated and released to an effluent field. Effluent is metered leaving the WWTP.
Water discharges – volumes by treatment method	100%	Domestic wastewater is regulated under an AEP EPEA Approval. Domestic wastewater is treated with coarse screening, primary clarification/sedimentation and sludge removal, aeration and microfiltration. After treatment, wastewater is released to an effluent field. The volume of total treated effluent released is metered leaving the WWTP. Both effluent and influent is recorded daily. Water treatment is also part of the oil processing facility. Regular water quality monitoring is also conducted at the CLR facility for parameters such as hardness, pH, turbidity and others to ensure water meets criteria for steam generation.
Water discharge quality – by standard effluent parameters	100%	Domestic wastewater is regulated under an AEP EPEA Approval. Domestic wastewater is treated with coarse screening, primary clarification/sedimentation and sludge removal, aeration and microfiltration. After treatment, wastewater is released to an effluent field. The volume of total treated effluent released is metered leaving the WWTP. Both effluent and influent is recorded daily. Water treatment is also part of the oil processing facility. Regular water quality monitoring is also conducted at the CLR facility for parameters such as hardness, pH, turbidity and others to ensure water meets criteria for steam generation.
Water discharge quality – temperature	100%	MEG continually monitors the temperature of water disposed into disposal wells as per AER Directive 051: Injection and Disposal Wells and reports the results to the AER annually as per Directive 054: Performance Presentations, Auditing and Surveillance of In Situ Oil Sands Schemes. In addition to temperature, MEG monitors pH to ensure values are within regulated limits as well as periodic measurements of major ions for disposal fluid compatibility assessments and water treatment plant operations purposes. Any industrial runoff (rain water that lands on the plant developed area and snowmelt) is released at ambient temperature. Water in the potable water treatment plant is analyzed daily for parameters identified regulatory approvals/licenses which include manganese, iron, chlorine, pH, turbidity and temperature.
Water consumption – total volume	100%	Water consumption is regulated by the Alberta Energy Regulator (AER) and Alberta Environment & Parks (AEP). Various approvals under the Environment Protection and



		<p>Enhancement Act (EPEA), AER Directives, and Water Act Licenses outline monitoring, measuring and reporting requirements including withdrawal volumes, technical standards and frequencies. Measurement methods include metering as per AER Directives 17 and 42. Measurement and reporting are conducted on various frequencies including continuous, daily, monthly, or annually depending on the source or activity. Water Act licenses include requirements for production rate, volume, water level and quality and reporting. Surface water diversion is measured by the pump rate and truck capacity. Groundwater monitoring programs are in place to monitor usage and quality. Water quality monitoring is conducted at CLRP for parameters (hardness, pH, chloride etc.).</p>
Water recycled/reused	100%	<p>MEG complies with the AER Directive 081 which outlines water management requirements for the thermal in situ oil sands operations. It sets disposal limits, requiring efficient recycling of produced water, ensuring the effective use of make-up water. Produced water is continuously metered using flow meters. Readings are monitored daily and meters are calibrated annually. Regular water quality monitoring is conducted at the facility for parameters such as hardness, turbidity and others to steam generation criteria is met. Water recycle is continuously monitored and reported on a monthly basis internally and to the AER. SAGD drilling operations re-uses water from the drilling mud process to minimize drilling makeup water use. Drilling mud is reused until mud consistency becomes problematic and then waste fluids are hauled off site for disposal at an approved waste management facility. This has drastically reduced that amount of make up water required in the SAGD drilling process.</p>
The provision of fully-functioning, safely managed WASH services to all workers	100%	<p>Source water for domestic use is pulled from a high quality groundwater source under an AER issued Water Act Licence. This water is treated by an onsite potable water plant to meet Canadian drinking Water Quality guidelines daily. Sanitation facilities are available in all permanent buildings as well as provided as portable wash car units at active project construction areas around the facility. Potable water is piped to the Control, Administration and Maintenance building on site and is trucked to other facilities such as camps. Water in the potable water treatment plant is analyzed daily for parameters identified regulatory approvals/licenses which include manganese, iron, chlorine, pH, turbidity and temperature.</p>



## W1.2b

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

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	13,897	About the same	<p>Although the total water withdrawal volume remained about the same (about 9% higher from 2018), the volumes of make-up water for steam generation decreased significantly from 2018 to 2019. As produced water to steam ratio (PWSR) increased in 2019, this resulted in higher volumes of water being returned to the CLRP Central Processing Facility (CPF). As such, MEG was able to recycle more produced water, resulting in lower need for make-up water. This is also partially a result of optimization projects completed in 2018 that and fully realized in 2019. Previously, a portion of make-up water was being used within the facility to cool produced water. Optimization work allowed MEG to stop servicing this 'quench' water flow with groundwater, significantly reducing make-up water intensities. MEG also implemented changes to the saline water system. Non-saline water was replaced with saline water as the primary make-up water source for steam generation. Focus was also placed on reducing non-saline water for utility use. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water usage. The application of MEG eMSAGP technology has enabled MEG to reduce its SOR to 2.22 for 2019. MEG continued the deployment of eMSAGP technology at the Christina Lake Phase 2B wells in 2019 and advanced the eMVAPEX pilot. Future volumes of total water withdrawal are anticipated to increase as steam capacity and production increases, however, reservoir technology development along with optimization projects have reduced water use intensities and further intensity reductions are anticipated. Future volumes of non-saline water withdrawals could decrease slightly as projects to reduce non-saline water demand are being</p>



			evaluated. Future volumes of produced water are likely to continue to increase along with an increase in steam capacity and production.
Total discharges	13,641	About the same	Total water disposal volume remained about the same (about 10% higher than 2018). There was a slight change in total water discharge is due to an increase in the amount of steam injected into the reservoir at the CLRP facility. otherwise there were no major changes in the year that significantly impact total disposal. The volume of water discharge may increase slightly in the future as steam capacity and produced water returns increase. In part, this increase will be managed with the future implementation of a blowdown disposal evaporator which will improve water recycle capabilities and reduce blowdown disposal.
Total consumption	256	Lower	The 2019 total water consumption was about 15% lower than 2018. The produced water to steam ratio (PWSR) increased in 2019, and resulted in higher volumes of water being returned to the CLRP CPF. As such, MEG increased its produced water recycle at its, resulting in a lower total consumption. Future volumes of water consumption are anticipated to increase with new drum boiler steam generation sources. There was also a decrease in surface non-saline water use and potable water use due to a decrease in camp utilization and industrial activity.

### W-OG1.2c

**(W-OG1.2c) In your oil & gas sector operations, what are the total volumes of water withdrawn, discharged, and consumed – by business division – and what are the trends compared to the previous reporting year?**

	Volume (megaliters/year)	Comparison with previous reporting year %	Please explain
Total withdrawals - upstream	13,897	About the same	Although the total water withdrawal volume remained about the same (about 9% higher from 2018), the volumes of make-up water for steam generation decreased significantly from 2018 to 2019. As produced water to steam ratio (PWSR) increased in 2019, this resulted in higher volumes of water being returned to the CLRP Central Processing Facility (CPF). As such, MEG was able to recycle more produced water, resulting in lower need for make-up water.



			<p>This is also partially a result of optimization projects completed in 2018 that and fully realized in 2019. Previously, a portion of make-up water was being used within the facility to cool produced water. Optimization work allowed MEG to stop servicing this 'quench' water flow with groundwater, significantly reducing make-up water intensities. MEG also implemented changes to the saline water system. Non-saline water was replaced with saline water as the primary make-up water source for steam generation. Focus was also placed on reducing non-saline water for utility use. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water usage. The application of MEG eMSAGP technology has enabled MEG to reduce its SOR to 2.22 for 2019. MEG continued the deployment of eMSAGP technology at the Christina Lake Phase 2B wells in 2019 and advanced the eMVAPEX pilot. Future volumes of total water withdrawal are anticipated to increase as steam capacity and production increases, however, reservoir technology development along with optimization projects have reduced water use intensities and further intensity reductions are anticipated. Future volumes of non-saline water withdrawals could decrease slightly as projects to reduce non-saline water demand are being evaluated. Future volumes of produced water are likely to continue to increase along with an increase in steam capacity and production.</p>
Total discharges – upstream	13,641	About the same	<p>Total water disposal volume remained about the same (about 10% higher than 2018). There was a slight change in total water discharge is due to an increase in the amount of steam injected into the reservoir at the CLRP facility. otherwise there were no major changes in the year that significantly impact total disposal. The volume of water discharge may increase slightly in the future as steam capacity and produced water returns increase. In part, this increase will be managed with the future implementation of a blowdown disposal evaporator which will improve water recycle capabilities and reduce blowdown disposal.</p>
Total consumption – upstream	256	Lower	<p>The 2019 total water consumption was about 15% lower than 2018. The produced water to steam ratio (PWSR) increased in 2019, and resulted in higher volumes of water being returned to the CLRP CPF. As such, MEG increased its produced water recycle at its, resulting in a lower total consumption. Future volumes of water consumption are anticipated to increase with</p>

			new drum boiler steam generation sources. There was also a decrease in surface non-saline water use and potable water use due to a decrease in camp utilization and industrial activity.
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## W1.2d

**(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.**

	Withdrawals are from areas with water stress	Identification tool	Please explain
Row 1	No	WRI Aqueduct	MEG's currently operates in the Mackenzie River Basin. The WRI Aqueduct tool classifies the overall water risk in this area as Low to Medium Risk (1-2). Therefore MEG does not currently operate in water stressed areas MEG's water withdrawals are in accordance with the Water Act, the Water Conservation and Allocation Policy for Oilfield Injection (2006) and Alberta's Water for Life strategy. The Water Conservation and Allocation Policy for Oilfield Injection includes a Watershort Areas Assessment (2006) and MEG's operations are within an area that is identified as "Not Regionally Water-short". MEG does not anticipate issues in the future based on water availability and water use efficiency increases.

## W1.2h

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

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	53	Much lower	The water source is relevant because MEG diverts surface water for industrial purposes such as constructing ice roads, dust suppression and drilling associated with exploration and development drilling programs. All water withdrawals are licensed under the Water Act which outlines requirements including source locations and maximum annual volumes.

				As a result of reduced construction and drilling activities in 2019, withdrawal of this source was significantly lower. MEG utilizes no surface water from streams, rivers or lakes for process purposes. Future annual use will continue to align with capital spend and drilling activity during the year.
Brackish surface water/Seawater	Not relevant			MEG does not use brackish surface water/seawater. Therefore this sources is not relevant.
Groundwater – renewable	Relevant	600	Lower	Groundwater levels in all of the source aquifers are predicted to return to near pre-pumping levels within 50 years of the cessation of withdrawals, categorizing the sources as renewable. Produced water to steam ratio (PWSR) increased in 2019, and resulted in higher volumes of water being returned to the facility. As such, MEG was able to recycle more volume of produced water, resulting in lower much make-up water volumes. This reduction is also a result of optimization projects completed in 2018 and realized in 2019. which included the stop of servicing ‘quench’ water flow with groundwater and replacing non-saline with saline water as the primary make-up water source for steam. Future volumes are anticipated to increase as steam capacity and production increases however further reductions in intensities are anticipated through reservoir technology and optimization projects.
Groundwater – non-renewable	Not relevant			MEG does not use non-renewable groundwater. Therefore this sources is not relevant.
Produced/Entrained water	Relevant	13,244	About the same	Produced water is composed mainly of injected steam and water from the reservoir that is produced back along with the bitumen. Produced water is de-oiled and recycled. As produced water to steam ratio (PWSR) increased in 2019, this resulted in higher volumes of water being returned to the Central Processing Facility (CPF). As such, MEG was able to recycle more volume of produced water. More than 90% of water



				utilized is recycled on an ongoing basis for steam generation. Future volumes of produced water are anticipated to increase as steam chambers mature, eMSAGP/eMVAPEX are deployed at additional wells and new SAGD wells are brought into production.
Third party sources	Not relevant			MEG does not obtain water from a third party. Therefore this sources is not relevant.

## W1.2i

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

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	55	Lower	Wastewater is treated to meet the parameters of MEG's EPEA approval and is then released to an effluent field adjacent to the wastewater treatment plant. The volume of total treated effluent released is metered leaving the WWTP. Both effluent and Influent is recorded daily. The decrease in volume is a result of lower camp occupancy. Future trends of WWTP discharge are anticipated to increase if capital spend and associated increase in camp use.
Brackish surface water/seawater	Not relevant			This category is not relevant to MEG and MEG does not anticipate any future discharge to brackish surface water/seawater sources.
Groundwater	Relevant	13,586	About the same	Water discharge to this destination is relevant because MEG discharges process waste water that can no longer be used for steam generation into disposal wells completed in the Fort McMurray water sand. Future volumes of water discharge may increase slightly due to more wells being brought online. MEG also discharges steam into the reservoir for oil production.



Third-party destinations	Not relevant			MEG does not discharge water to this destination. This destination is not applicable to MEG. MEG does not anticipate any future discharge to third-party destinations.
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### W-OG1.3

**(W-OG1.3) Do you calculate water intensity for your activities associated with the oil & gas sector?**

Yes

### W-OG1.3a

**(W-OG1.3a) Provide water intensity information associated with your activities in the oil & gas sector.**

**Business division**

Upstream

**Water intensity value (m3)**

0.1

**Numerator: water aspect**

Other, please specify

Total Make-up Water Intensity

**Denominator**

Other, please specify

m3 of bitumen

**Comparison with previous reporting year**

Lower



**Please explain**

MEG is focused on efficient bitumen production which includes the efficient use of water. The primary use of water in MEG's operations is steam generation. Water used for steam generation consists of produced water (90%) and make-up water (10%) which includes saline and non-saline deep groundwater from hydrocarbon-bearing formations that are unsuitable for human or agriculture use. MEG calculates and tracks the total make-up water intensity and non-saline water intensity to monitor water make-up water use. The intensity metric is used internally to trend water performance and drive further reductions. A key measure of efficiency for thermal in-situ projects is the steam-oil ratio (SOR), with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce per barrel water usage, including the amount of make-up water required. MEG's strategy to reduce SOR and water intensities involves reservoir technology development such as eMSAGP and eMVAPEX, optimization of recycling technology and optimization projects such as plant modifications. In 2019, MEG experienced the lowest make-up water intensity and non-saline water intensity in its operational history as a result of these strategies (enabled MEG to reduce its company-wide SOR to 2.22 in 2019). This resulted in an approximate 40% decrease in make-up water intensity from the previous year. MEG continued the deployment of eMSAGP technology at the CLRP Phase 2B wells in 2019 as well as advancement of the eMVAPEX pilot. The future trends are anticipated to continue to decrease as a result of the technology development strategy and optimization projects.

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**Business division**

Upstream

**Water intensity value (m3)**

0.09

**Numerator: water aspect**

Other, please specify

Non-Saline Make-up Water Intensity

**Denominator**

Other, please specify

m3 of bitumen



**Comparison with previous reporting year**

Lower

**Please explain**

MEG is focused on efficient bitumen production which includes the efficient use of water. The primary use of water in MEG's operations is steam generation. Water used for steam generation consists of produced water (90%) and make-up water (10%) which includes saline and non-saline deep groundwater from hydrocarbon-bearing formations that are unsuitable for human or agriculture use. MEG calculates and tracks the total make-up water intensity and non-saline water intensity to monitor water make-up water use. The intensity metric is used internally to trend water performance and drive further reductions. A key measure of efficiency for thermal in-situ projects is the steam-oil ratio (SOR), with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce per barrel water usage, including the amount of make-up water required. MEG's strategy to reduce SOR and water intensities involves reservoir technology development such as eMSAGP and eMVAPEX, optimization of recycling technology and optimization projects such as plant modifications. In 2019, MEG experienced the lowest make-up water intensity and non-saline water intensity in its operational history as a result of these strategies (enabled MEG to reduce its company-wide SOR to 2.22 in 2019). This resulted in an approximate 40% decrease in make-up water intensity from the previous year. MEG continued the deployment of eMSAGP technology at the CLRP Phase 2B wells in 2019 as well as advancement of the eMVAPEX pilot. The future trends are anticipated to continue to decrease as a result of the technology development strategy and optimization projects.

**W1.4**

**(W1.4) Do you engage with your value chain on water-related issues?**

Yes, our suppliers

Yes, our customers or other value chain partners

**W1.4a**

**(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?**

Row 1

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**% of suppliers by number**

1-25

**% of total procurement spend**

1-25

**Rationale for this coverage**

Diversion water licences under the Water Act allow MEG to divert a specified volume for the purpose of industrial activity (e.g. constructing ice roads, dust suppression). MEG engages suppliers to provide water movement services for these activities. Suppliers are required to follow internal water diversion guidelines which provide direction for meeting water licence requirements including procedures for withdrawing water and record keeping. Training is mandatory for each individual providing water movement services. MEG conducts regular field inspections on suppliers and water sources to ensure procedures are followed and regulatory compliance. Suppliers are expected to comply with the regulations under the Water Act and MEG requirements. Lack of adherence to these requirements can potentially result in dismissal from the MEG site. Constant QA/QC processes ensure discrepancies in water tracking data are addressed immediately. Persistent issues would result in dismissal from site.

**Impact of the engagement and measures of success**

MEG engages suppliers to provide water movement services and requires the supplier to follow internal water diversion guidelines which provide direction for meeting water licence requirements including procedures for withdrawing water and record keeping. Data tracked by suppliers includes: diversion location, end location, volume and water usage. MEG uses this data to complete annual water use reports to meet the requirements outlined in the water license. Success is measured by successful submission of the annual water use report to the regulator and achievement of internal key performance indicators which includes zero non-compliance's association with water diversion and proper documentation.

**Comment**

All suppliers that manage or move water do so on MEG's behalf, under the Water Act approvals in place. All surface water transferred managed in accordance with the Water Act approvals including training, tracking (QA/QC) and reporting. All suppliers environmental performance is evaluated before they are awarded a contract with MEG and commit to meeting or exceeding MEGs expectation prior to mobilizing to execute a work scope.

## W1.4b

### (W1.4b) Provide details of any other water-related supplier engagement activity.

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#### Type of engagement

Onboarding & compliance

#### Details of engagement

Requirement to adhere to our code of conduct regarding water stewardship and management

#### % of suppliers by number

76-100

#### % of total procurement spend

76-100

#### Rationale for the coverage of your engagement

The prevention of spills or reduction in their severity is a key environmental initiative at MEG. Prevention as well as prompt and appropriate spill response is critical to mitigating environmental impacts including impacts to any water bodies. MEG spill prevention and reporting details are included as part of the mandatory site orientation that every contractor and employee takes before working at CLRP and therefore broad understanding of MEG's expectation of spill prevention and reporting is communicated to each person on site.

#### Impact of the engagement and measures of success

MEG tracks hydrocarbon and non-hydrocarbon spills across its operations and identifies trends so the causes are understood, and appropriate preventative measures are implemented. MEG measures the success of engagement by conducting audits and inspections which include worker interviews to ensure awareness of their company policies and procedures around spill prevention and reporting and how they meet or exceed those of MEG Energy. Any identified issues are communicated to that companies management team. MEG also believes it has created a culture of transparency where contractors are encouraged to bring any issues forward to MEG through its hazard identification card program. Success is measured by meeting or exceeding corporate spill targets. In 2019 MEG surpassed the spill intensity target. In 2019 MEG experienced 4 low volume government reportable spills, none of which had impacts to water bodies.

## Comment

### W1.4c

**(W1.4c) What is your organization's rationale and strategy for prioritizing engagements with customers or other partners in its value chain?**

In 2019, MEG engaged with partners in its value chain by being an active participant in the CAPP Water Committee and Petroleum Technology Alliance Canada. To date most water committee engagement has comprised the identification of regulatory change that may impact MEG's access or use of water. We also have shared water sources with other operators (first come first serve water licenses ensure priority of use) and provide road access to man-made sources such as borrow pits to reduce the impact of water withdrawal from natural wetlands. MEG is also part of the Christina Lake Regional Water Management Agreement with other operators in the Christina Lake area to work together on a collective water management model in the region ensuring adequate management of current and future groundwater use and water disposal. Continued adequate management of current and future groundwater use and water disposal in the region is a MEG's measure of engagement success.

## 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?**

MEG identifies potential water pollutants associated with its activities in the oil and gas sector through Environmental Impact Assessments (EIA) that are conducted for each project. Potential pollutants are identified throughout the value chain of the project, from construction, to drilling activities, to operations through to decommissioning and reclamation. The EIA method takes both a qualitative and quantitative evaluation approach to identify potential water pollutants. The qualitative analysis is based on previous EIAs, monitoring programs, literature and professional judgement. The quantitative analysis uses models and analytical methods. Water quality data is evaluated against water quality guidelines for the protection of non-saline aquatic life, human health and wildlife health. The evaluation is based on the more conservative guidelines of the following (among others): Alberta Environment - Surface Water Quality Guidelines for Use in Alberta, U.S. Environmental Protection Agency National Recommended Water Quality Criteria and the Canadian Council of Ministers of the Environment (CCME)- Canadian Environmental Quality Guidelines. MEG also identifies potential water pollutants associated with its activities by identifying and labeling chemicals on site in accordance with Transportation of s Good Requirements and Workplace Hazardous Material Information System (WHIMIS). Pollutants are identified and monitored in accordance with MEG's EPEA approval as well as licenses obtained under the AEP Water Act that validate the EIA findings and MEG actively monitors impacts of projects activities. The EPEA approval applies to all parts of the project including construction, operations through to decommissioning and reclamation. Monitoring programs include groundwater monitoring programs that monitors groundwater withdrawal, wastewater disposal, accidental releases from surface facilities and casing failures and steam injection. Groundwater monitoring is also in place for camp and utility water withdrawal. Monitoring results are assessed in the context of regulatory guidelines such as the Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Hazard and risk assessments are conducted and documented for all work projects undertaken by value chain partners conducting work on behalf of MEG. Evaluation criteria include material and chemical composition to identify pollutants that can potentially enter water in case of a spill or accident. These potentials hazards are eliminated or controlled as applicable. MEG also identifies potential pollutants across its downstream value chain which includes our diluted bitumen product that is shipped across North America for sale using pipelines and, at times, held in storage at one of several locations prior to sale. This also includes purchased diluent is similarly transported across North America to MEG's production site at CLRP using pipelines. A spill of these transported products, if it were to occur into a body of water, could present significant environmental risk. To, date no such even has occurred.



### 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	Any introduction of toxic or anthropogenic substances into the aquatic environment has the potential to result in changes to water quality. Pollutants from chemicals and hydrocarbons could degrade water and sediment quality and elevate concentrations of the specific chemical or hydrocarbon releases. Impacts would depend on the nature, duration and volume of the release. Chemicals that have the potential to be released to the environment include constituents regularly used and produced in the oil and gas industry, including various hydrocarbons such as oil, grease, fuels and coolants such as glycol and methanol. Other chemicals include natural gas condensate and refined naphtha often used a diluent to transport bitumen. Chemicals associated with drilling cuttings and drilling fluid also have the potential to be released. High temperature process water (such as produced	Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Community/stakeholder engagement Emergency preparedness Other, please specify Monitoring	MEG incorporates a number of design features; management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. These management plans include minimum setbacks from waterbodies, grading and berms, controlled release of retained water, secondary containment around storage vessels and containers, and reclamation and revegetation of all disturbed areas to reduce potential for erosion and surface sediment runoff. Management practices, contingency plans and emergency response plans are implemented to prevent and address leaks. This includes spill training to all MEG site personnel and contractors and keeping spill kits onsite which includes specialized equipment to control risks to aquatic environments. All industrial runoff and other collected surface water from all MEG developed sites is sampled prior to being released to the environment. Water is tested for chlorides content, pH, visible hydrocarbon sheen



		water) also has the potential to impact water quality.		and any chemical contamination. MEG's EPEA approval requires implementation of an approved Soil, Groundwater Monitoring and Wetland Monitoring Program (GWM). The soil monitoring program is completed in five year intervals as per regulatory requirements. Identifying and mitigating contaminates in soils prevents the risk of contaminate transfer to groundwater. The GWM program consists of GWM wells that are installed in the Central Plant and on the well pads. Groundwater monitoring and quality data is collected and used to assess groundwater flow characteristics and evaluate groundwater quality. Results are documented and reported to AEP. MEG also has a Wetland Program requires MEG to obtain surface water samples which are used to assess the effects of potential contaminants through surface water transport or from aerial disposition. The detailed water quality parameters are assessed once annually with any potentially impacted conditions being noted and further recommendations provided.
Chemicals	Upstream	Any introduction of toxic or anthropogenic substances into the aquatic environment has the potential to result in changes to water quality. Pollutants from chemicals and hydrocarbons could degrade water and sediment quality and elevate concentrations of the specific chemical or hydrocarbon releases.	Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Community/stakeholder engagement	MEG incorporates a number of design features; management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. These management plans include minimum setback from waterbodies, grading and berms, controlled release of retained water, secondary containment around storage



		<p>Impacts would depend on the nature, duration and volume of the release. Chemicals that have the potential to be released to the environment include constituents regularly used and produced in the oil and gas industry, including various hydrocarbons such as oil, grease, fuels and coolants such as glycol and methanol. Other chemicals include natural gas condensate and refined naphtha often used a diluent to transport bitumen. Chemicals associated with drilling cuttings and drilling fluid also have the potential to be released. High temperature process water (such as produced water) also has the potential to impact water quality.</p>	<p>Emergency preparedness Other, please specify Monitoring</p>	<p>vessels and containers, and reclamation and revegetation of all disturbed areas to reduce potential for erosion and surface sediment runoff. Management practices, contingency plans and emergency response plans are implemented to prevent and address leaks. This includes spill training to all MEG site personnel and contractors and keeping spill kits onsite which includes specialized equipment to control risks to aquatic environments. All industrial runoff and other collected surface water from all MEG developed sites is sampled prior to being released to the environment. Water is tested for chlorides content, pH, visible hydrocarbon sheen and any chemical contamination. MEG's EPEA approval requires implementation of an approved Soil, Groundwater Monitoring and Wetland Monitoring Program (GWM). The soil monitoring program is completed in five year intervals as per regulatory requirements. Identifying and mitigating contaminates in soils prevents the risk of contaminate transfer to groundwater. The GWM program consists of GWM wells that are installed in the Central Plant and on the well pads. Groundwater monitoring and quality data is collected and used to assess groundwater flow characteristics and evaluate groundwater quality. Results are documented to AEP. MEG also has a Wetland Program requires MEG to obtain surface</p>
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				water samples which are used to assess the effects of potential contaminants through surface water transport or from aerial disposition. The detailed water quality parameters are assessed once annually with any potentially impacted conditions being noted and further recommendations provided.
Drilling fluids	Upstream	Any introduction of toxic or anthropogenic substances into the aquatic environment has the potential to result in changes to water quality. Pollutants from chemicals and hydrocarbons could degrade water and sediment quality and elevate concentrations of the specific chemical or hydrocarbon releases. Impacts would depend on the nature, duration and volume of the release. Chemicals that have the potential to be released to the environment include constituents regularly used and produced in the oil and gas industry, including various hydrocarbons such as oil, grease, fuels and coolants such as glycol and methanol. Other chemicals include natural gas condensate and refined naphtha often used a diluent to transport bitumen. Chemicals associated with drilling cuttings and drilling fluid also have the potential to be released. High temperature process water (such as produced water) also has the potential to impact water quality.	<p>Compliance with effluent quality standards</p> <p>Measures to prevent spillage, leaching and leakages</p> <p>Community/stakeholder engagement</p> <p>Emergency preparedness</p> <p>Other, please specify</p> <p>Monitoring</p>	MEG incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants, including drilling fluids. These management plans include minimum setback from waterbodies, grading and berms, controlled release of retained water, secondary containment around storage vessels and containers, and reclamation and revegetation of all disturbed areas to reduce potential for erosion and surface sediment runoff. Management practices, contingency plans and emergency response plans are implemented to prevent and address leaks. This includes spill training to all MEG site personnel and contractors and keeping spill kits onsite which includes specialized equipment to control risks to aquatic environments. MEG sets surface casing below the depth of ground water protection which eliminates possible migration of drilling fluids into potable groundwater sources. Drilling conducted on clay pads or on prepared leases to prevent interaction of any spilled material



				<p>with the environment. All industrial runoff and other collected surface water from all MEG developed sites is sampled prior to being released to the environment. Water is tested for chlorides content, pH, visible hydrocarbon sheen and any chemical contamination. MEG’s EPEA approval requires implementation of an approved Groundwater Monitoring and Wetland Monitoring Program (GWM). The GWM program consists of GWM wells that are installed in the Central Plant and on the SAGD Pads. Groundwater monitoring and quality data is collected and used to assess groundwater flow characteristics, and evaluate groundwater quality. Results are documented to AEP. The Wetland Program requires MEG to obtain surface water samples which are used to assess the effects of potential contaminants through surface water transport or from aerial disposition. The detailed water quality parameters are assessed once annually with any potentially impacted conditions being noted and further recommendations provided.</p>
Cuttings	Upstream	Any introduction of toxic or anthropogenic substances into the aquatic environment has the potential to result in changes to water quality. Pollutants from chemicals and hydrocarbons could degrade water and sediment quality and elevate concentrations of the specific chemical or hydrocarbon releases.	<p>Compliance with effluent quality standards</p> <p>Measures to prevent spillage, leaching and leakages</p> <p>Community/stakeholder engagement</p>	<p>Management of water that may contact the cuttings is done in alignment with EPEA and Directive 055 to ensure no impacts prior to release to the environment. This includes measurement of key parameters that meet release criteria prior to any release of accumulated surface water to the environment. Cuttings are initially managed within</p>



		<p>Impacts would depend on the nature, duration and volume of the release. Chemicals that have the potential to be released to the environment include constituents regularly used and produced in the oil and gas industry, including various hydrocarbons such as oil, grease, fuels and coolants such as glycol and methanol. Other chemicals include natural gas condensate and refined naphtha often used a diluent to transport bitumen. Chemicals associated with drilling cuttings and drilling fluid also have the potential to be released. High temperature process water (such as produced water) also has the potential to impact water quality.</p>	<p>Emergency preparedness Other, please specify Monitoring</p>	<p>bins located on MEG's leases. They are then stabilized and hauled off-site for approved disposal. No drill cuttings are disposed of on-site. Part of on-going drilling operations includes daily site inspections to ensure MEG's policies and procedures around spill prevention are adhered to by all employees and contractors on site. Any spilled material is immediately cleaned up and hauled away for disposal. Spill cleanups that contact soil, include full delineation and soil sampling against Alberta Tier 1 soil guidelines to ensure no residual impacts remain. The success of our spill prevention and clean up measures is monitored by MEGs ongoing soil and groundwater monitoring program to ensure no impacts occur to the groundwater or surrounding aquatic environment. MEG also conducts site inspections to ensure spill prevention and solids management is executed as per MEG's policies and procedures. These policies and procedures are in place to prevent any release of drilling waste (including cuttings) to the environment.</p>
<p>Other, please specify Produced Water</p>	<p>Upstream</p>	<p>Any introduction of toxic or anthropogenic substances into the aquatic environment has the potential to result in changes to water quality. Pollutants from chemicals and hydrocarbons could degrade water and sediment quality and elevate concentrations of the specific chemical or hydrocarbon releases.</p>	<p>Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Community/stakeholder engagement</p>	<p>MEG incorporates a number of design features; management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. These management plans include minimum setbacks from waterbodies, grading and berms, controlled release of retained water, secondary containment</p>



		<p>Impacts would depend on the nature, duration and volume of the release. Chemicals that have the potential to be released to the environment include constituents regularly used and produced in the oil and gas industry, including various hydrocarbons such as oil, grease, fuels and coolants such as glycol and methanol. Other chemicals include natural gas condensate and refined naphtha often used a diluent to transport bitumen. Chemicals associated with drilling cuttings and drilling fluid also have the potential to be released. High temperature process water (such as produced water) also has the potential to impact water quality.</p>	<p>Emergency preparedness Other, please specify Monitoring</p>	<p>around storage vessels and containers, and reclamation and revegetation of all disturbed areas to reduce potential for erosion and surface sediment runoff. MEG's EPEA approval requires implementation of an approved Soil, Groundwater Monitoring and Wetland Monitoring Program (GWM). The soil monitoring program is completed in five year intervals as per regulatory requirements. Identifying and mitigating contaminates in soils prevents the risk of contaminate transfer to groundwater. The GWM program consists of GWM wells that are installed in the Central Plant and on the SAGD Pads. Groundwater monitoring and quality data is collected and used to assess groundwater flow characteristics and evaluate groundwater quality. Results are documented to AEP. The Wetland Program requires MEG to obtain surface water samples which are used to assess the effects of potential contaminants through surface water transport or from aerial disposition. The detailed water quality parameters are assessed once annually with any potentially impacted conditions being noted and further recommendations provided.</p>

## 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.

#### Direct operations

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##### Coverage

Full

##### Risk assessment procedure

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

##### Frequency of assessment

More than once a year

##### How far into the future are risks considered?

More than 6 years

##### Type of tools and methods used

Enterprise Risk Management

##### Tools and methods used

Other, please specify  
Internal Framework

##### Comment

MEG uses a value-driven Enterprise Risk Management (ERM) philosophy to identify key strategic risks. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG's entire leadership team is engaged in evaluation and ranking of risk areas across the organization Risks identified in MEG's assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future operating conditions and business or political environment.

## Supply chain

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### Coverage

Partial

### Risk assessment procedure

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

### Frequency of assessment

More than once a year

### How far into the future are risks considered?

More than 6 years

### Type of tools and methods used

Enterprise Risk Management

### Tools and methods used

Other, please specify  
Internal Framework

### Comment

MEG uses a value-driven Enterprise Risk Management (ERM) philosophy to identify key strategic risks. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG's entire leadership team is engaged in evaluation and ranking of risk areas across the organization Risks identified in MEG's assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and



potential future operating conditions and business or political environment. Suppliers must meet HS&E requirements in order to be granted work. This includes requirements that stem from assessing where there is a potential for spills that could impact water bodies or ensuring regulatory requirements by contractors are met. For example, Diversion Water Licences under the Water Act allow MEG to divert a specified volume of water for the purpose of industrial activity (e.g. constructing ice roads, dust suppression and drilling associated with oil sands exploration programs). MEG engages suppliers to provide water movement (hauling) services and requires suppliers follow internal water diversion guidelines which provide direction for meeting water licence requirements including procedures for withdrawing water and record keeping.

**Other stages of the value chain**

**Coverage**

None

**Comment**

**W3.3b**

**(W3.3b) Which of the following contextual issues are considered in your organization’s water-related risk assessments?**

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. Contextual issues such as water quantity, quality, quality, regulatory frameworks, status of ecosystems and habits, stakeholder concerns and WASH requirements are initially considered through the environmental impact assessment (EIA) process and regularly through MEG’s Enterprise Risk Management (ERM). The components of the EIA include hydrogeology, hydrology, surface water quality, and aquatic ecology and evaluate current conditions as well as identify components of projects that could affect groundwater quantity and quality,



		<p>hydrologic conditions, surface water quality and aquatic resources such as fish. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. MEG also implements various monitoring programs to ensure adequate monitoring and management of potential contextual issues. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG’s risk assessment process identifies risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future business and political environment. Ongoing assessment of these contextual issues is conducted by The Water Strategy Committee. The committee is responsible for identifying potential and emerging risks and opportunities, developing mitigation strategies and monitoring performance of water activities. Topics such as regulatory changes, efficient water use and water availability among others are considered. MEG is also part of an agreement with other operators in the region to ensuring adequate management of water resources.</p>
<p>Water quality at a basin/catchment level</p>	<p>Relevant, always included</p>	<p>The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. Contextual issues such as water quantity, quality, quality, regulatory frameworks, status of ecosystems and habits, stakeholder concerns and WASH requirements are initially considered through the EIA process and regularly through MEG’s ERM. The components of the EIA include hydrogeology, hydrology, surface water quality, and aquatic ecology and evaluate current conditions as well as identify components of projects that could affect groundwater quantity and quality, hydrologic conditions, surface water quality and aquatic resources such as fish. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. MEG also implements various monitoring programs to ensure adequate monitoring and management of potential contextual issues. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility</p>



		<p>design. MEG’s risk assessment process identifies risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future business and political environment. Ongoing assessment of these contextual issues is conducted by The Water Strategy Committee. The committee is responsible for identifying potential and emerging risks and opportunities, developing mitigation strategies and monitoring performance of water activities. Topics such as regulatory changes, efficient water use and water availability among others are considered. MEG is also part of an agreement with other operators in the region to ensuring adequate management of water resources.</p>
<p>Stakeholder conflicts concerning water resources at a basin/catchment level</p>	<p>Relevant, always included</p>	<p>The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. Contextual issues including stakeholder are initially considered through the EIA process and regularly through MEG’s ERM. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. MEG also implements various monitoring programs to ensure adequate monitoring and management of potential contextual issues. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG recognizes the importance of regional cooperation and planning among a broad variety of community and stakeholder groups and works closely with all identified stakeholders associated with MEG’s operations to help plan MEG’s use of water resources during regulatory, exploration, construction, operation, health &amp; safety, and environmental work. MEG complies with consultation guidelines such as ‘The Government of Alberta’s Policy on Consultation with First Nations on Land and Natural Resource Management, 2013’ and is also part of the Christina Lake Regional Water Management Agreement with other operators in the Christina Lake area to work together on a collective water management model in the region ensuring adequate management of current and future groundwater use and water disposal.</p>

<p>Implications of water on your key commodities/raw materials</p>	<p>Relevant, sometimes included</p>	<p>The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. In this context, access to and availability of surface water as a raw material is required for the suppliers to be able to provide ice road services. Contextual issues such as water quantity, quality, quality, regulatory frameworks, status of ecosystems and habits, stakeholder concerns and WASH requirements are initially considered through the EIA process and regularly through MEG’s ERM. The components of the EIA include hydrogeology, hydrology, surface water quality, and aquatic ecology and evaluate current conditions as well as identify components of projects that could affect groundwater quantity and quality, hydrologic conditions, surface water quality and aquatic resources such as fish. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. MEG also implements various monitoring programs to ensure adequate monitoring and management of potential contextual issues. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG’s risk assessment process identifies risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future business and political environment. MEG also recognizes that key commodities/raw materials (electricity purchases, diluent, natural gas) may have associated water risks. MEG’s current water-related risk assessment is mainly operationally focused however, MEG considers potential water impacts on water from the transportation of purchased diluent across North America to MEG’s production site at CLRP using pipelines. To, date no such even has occurred.</p>
<p>Water-related regulatory frameworks</p>	<p>Relevant, always included</p>	<p>The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. All water sources utilized by MEG are regulated by regional regulatory bodies where MEG operates including the Alberta Energy</p>



		<p>Regulator (AER) and Alberta Environment &amp; Parks (AEP). Environment Protection and Enhancement Act (EPEA) approvals, AER Directives, and Water Act Licenses governed by these regulatory bodies outline operational, monitoring, measuring, quality and reporting requirements. Regulatory frameworks are initially considered through the EIA process and regularly through MEG’s ERM. The EIA includes consideration of water-related regulator frameworks. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants and ensure compliance with regulatory requirements. MEG also implements various monitoring programs to ensure adequate monitoring and management of potential contextual issues. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG’s risk assessment process identifies risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future business and political environment. Ongoing assessment of these contextual issues is conducted by The Water Strategy Committee. The committee is responsible for identifying potential and emerging risks and opportunities, developing mitigation strategies and monitoring performance of water activities. Topics such as regulatory changes, efficient water use and water availability among others are considered.</p>
<p>Status of ecosystems and habitats</p>	<p>Relevant, always included</p>	<p>The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. Contextual issues such of ecosystems and habitats are initially considered through the EIA process and regularly through MEG’s ERM. The components of the EIA include hydrogeology, hydrology, surface water quality, and aquatic ecology and evaluate current conditions as well as identify components of projects that could affect groundwater quantity and quality, hydrologic conditions, surface water quality and aquatic resources such as fish. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. ERM is integrated into strategic planning, business planning, operating practices, marketing, compliance</p>



		monitoring, operating performance measurement and facility design. MEG’s risk assessment process identifies risks that could potentially be most significant to the organization and its ability to achieve its business/strategic objectives. Risks identified in MEG’s assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future business and political environment. Monitoring programs including the groundwater monitoring program and wetland monitoring program are in place to ensure adequate management of the region. MEG is also part of the Christina Lake Regional Water Management Agreement with other operators in the Christina Lake area to work together on a collective water management model in the region ensuring adequate management of current and future groundwater use and water disposal.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	The availability of water could impact MEG’s operating results and domestic water supply and therefore contextual issues that may impact the access to water and water quality and quantity are considered in MEG’s risk assessments. These contextual issues are considered for all water sources utilized by MEG: groundwater, potable water, and produced water and non-saline surface water. MEG provides WASH services for all MEG. Source water for domestic use is pulled from a high quality groundwater source under an AER issued Water Act Licence. This water is treated by an onsite potable water plant to meet Canadian drinking Water Quality guidelines
Other contextual issues, please specify	Not considered	

### W3.3c

**(W3.3c) Which of the following stakeholders are considered in your organization’s water-related risk assessments?**

	Relevance & inclusion	Please explain
Customers	Relevant, always included	Reputational impacts which include the potential loss of stakeholder or shareholder trust are included in MEG’s risk assessment. Development of the Alberta oil sands has received considerable attention on the subjects of environmental and social impacts. The influence of anti-fossil fuels activists (with a focus on oil sands)



		targeting equity and debt investors, lenders and insurers and changes in consumer (customer) behavior may result in policies which reduce support for or investment in the Alberta oil sands sector. Certain insurance companies have taken actions or announced policies to limit available coverage for companies which derive some or all of their revenue from the oil sands sector. As a result of these policies, premiums and deductibles for some or all of the Corporation’s insurance policies could increase substantially. In some instances, coverage may become unavailable or available only for reduced amounts of coverage. As a result, the Corporation may not be able to extend or renew existing policies, or procure other desirable insurance coverage, either on commercially reasonable terms, or at all. Negative consequences which could arise as a result of changes to the current regulatory environment include, but are not limited to, changes in environmental regulation of current and future projects by governmental authorities, which could result in changes to facility design and operating requirements, potentially increasing the cost of construction, operation and abandonment. In addition, legislation or policies that limit the purchase of crude oil or bitumen produced from the oil sands may be adopted in domestic and/or foreign jurisdictions, which, in turn, may limit the world market for this crude oil, reduce its price and may result in stranded assets or an inability to further develop oil resources. MEG engages with customers by providing disclosure on its water performance and management activities. MEG is committed to further integrate ESG practices throughout the business and will continue to monitor and manage risks and drive more impactful disclosure to continue working towards being the last ethically, environmentally, and economically produced barrel of oil.
Employees	Relevant, always included	Risk assessments are used to determine or evaluate the potential likelihood and severity of various risks at the work site and are required when there is a potential for risk of injury to people, loss of property, and impact to the environment including water. Hazard identification and risk assessments are carried out for projects and if a new work process is introduced. The process eliminates or reduces the risk by implementing appropriate risk mitigation measures. These assessments are carried out as regular part of inspections conducted at work sites by management, site representatives, employees and contractors and must be conducted before work is started at a site and on a regular basis to prevent the development work conditions that are unsafe, unhealthy or can potentially impact the environment and water.
Investors	Relevant, always included	MEG is committed to responsible stewardship of investment. One of the Board’s primary responsibilities are to preserve and enhance long-term value. This involves strategic planning and risk management and mitigation, including water-related risks. Reports on MEG’s environmental performance, including water performance, are

		<p>provided to the Board on a quarterly basis. MEG is committed to further integrate ESG practices throughout the business and will continue to monitor and manage risks and drive more impactful disclosure to continue working towards being the last ethically, environmentally, and economically produced barrel of oil. MEG engages with investors by providing disclosure on its water performance and management activities. MEG is committed to further integrate ESG practices throughout the business and will continue to monitor and manage risks and drive more impactful disclosure to continue working towards being the last ethically, environmentally, and economically produced barrel of oil.</p>
Local communities	Relevant, always included	<p>MEG consults with various stakeholders when assessing and mitigating risks through the Environmental Impact Assessment (EIA) process. Stakeholders include government agencies, Indigenous communities, regional and municipal governments, regional service providers, and special interest groups as well as stakeholders with a potential interest in the land on or near the Project. A series of groundwater monitoring programs have been implemented to monitor groundwater usage and quality to ensure no impacts to local communities occur. Local communities and stakeholders can contact MEG with any potential concerns through the Community Relations team. MEG's current water-related risk assessment is operationally focused, and NGO's are not currently included in the water-related risk assessment. MEG is committed to further integrate ESG practices throughout the business and will continue to monitor and manage risks and drive more impactful disclosure to continue working towards being the last ethically, environmentally, and economically produced barrel of oil.</p>
NGOs	Relevant, not included	<p>MEG's current water-related risk assessment is operationally focused, and NGO's are not currently included in the water-related risk assessment. MEG will explore potential future engagement through various mechanisms such as materiality assessments. Contextual issues such as water quality, quantity, regulatory frameworks, status of ecosystems and habits as well as stakeholder concerns initially through the environmental impact assessment (EIA) process and regularly through MEG's Enterprise Risk Management System (ERM). The components of the EIA include hydrogeology, hydrology, surface water quality, and aquatic ecology and evaluate current conditions as well as identify components of projects that could affect groundwater quantity and quality, hydrologic conditions, surface water quality and aquatic resources such as fish. The EIA considers cumulative effects. As a result of the EIA, CLRP incorporates a number of design features, management practices and mitigation plans to minimize the potential for adverse impact of potential water pollutants. MEG also implements various monitoring programs to ensure adequate management of potential contextual issues.</p>

		MEG is part of the Christina Lake Regional Water Management Agreement with other operators in the Christina Lake area to work together on a collective water management model in the region ensuring adequate management of current and future groundwater use and water disposal.
Other water users at a basin/catchment level	Relevant, always included	MEG consults with various stakeholders when assessing and mitigating risks through the Environmental Impact Assessment (EIA) process. Stakeholders include government agencies, Indigenous communities, regional and municipal governments, regional service providers, and special interest groups as well as stakeholders with a potential interest in the land on or near the Project. AEP and AER regulatory requirements are captured and adhered to. Environmental and Regulatory risks are discussed in the Annual Information Form.
Regulators	Relevant, always included	MEG consults with various stakeholders when assessing and mitigating risks through the Environmental Impact Assessment (EIA) process. Stakeholders include government agencies, Indigenous communities, regional and municipal governments, regional service providers, and special interest groups as well as stakeholders with a potential interest in the land on or near the Project. AEP and AER regulatory requirements are captured and adhered to. Environmental and Regulatory risks are discussed in the Annual Information Form.
River basin management authorities	Relevant, always included	MEG considers all regulatory and management authorities within its water-risk assessment. The Alberta Land Stewardship Act (ALSA) creates the authority for regional plans to be created under the Land-use Framework. MEG may be affected by any regional plans implemented under ALSA. The plans implements environmental management frameworks for air emissions, water use, and land disturbance to control cumulative environmental effects of industrial development. MEG is part of the Christina Lake Regional Water Management Agreement with other operators in the Christina Lake area to work together on a collective water management model in the region ensuring adequate management of current and future groundwater use and water disposal.
Statutory special interest groups at a local level	Relevant, always included	MEG consults with various stakeholders when assessing and mitigating risks through the Environmental Impact Assessment (EIA) process. Stakeholders include government agencies, Indigenous communities, regional and municipal governments, regional service providers, and special interest groups as well as stakeholders with a potential interest in the land on or near the Project. A series of groundwater monitoring programs have been implemented to monitor groundwater usage and quality to ensure no impacts to local



		communities occur. Local communities and stakeholders can contact MEG with any potential concerns through the Community Relations team.
Suppliers	Relevant, sometimes included	MEG recognizes that key suppliers may have associated water risks. MEG’s current water-related risk assessment is operationally focused, and suppliers are not currently included in the water-related risk assessment. However, Suppliers must meet HS&E requirements in order to be granted work. This includes requirements that stem from assessing where there is a potential for spills that could impact water bodies or ensuring regulatory requirements by contractors are met. For example Diversion Water Licences under the Water Act allow MEG to divert a specified volume of water for the purpose of industrial activity (e.g. constructing ice roads, dust suppression and drilling associated with oil sands exploration programs). MEG engages suppliers to provide water movement (hauling) services and requires the supplier to follow internal water diversion guidelines which provide direction for meeting water licence requirements including procedures for withdrawing water and record keeping.
Water utilities at a local level	Not relevant, explanation provided	MEG does not obtain water from a water utility provider.
Other stakeholder, please specify	Not considered	

### W3.3d

**(W3.3d) 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.**

The Board is responsible for (a) understanding the principal risks of the Corporation’s business and confirming that systems are in place that effectively monitor and manage those risks with a view to a long-term viability of the Corporation, (b) overseeing the Corporation’s enterprise risk management (ERM) program, including its design and structure and assessment of its effectiveness, (c) overseeing the Corporations principal risks directly or, where the Board determines it to be appropriate, delegating the oversight of certain individual risks to a committee of the Board, and (d) approving management’s approach to ERM and its mitigation practices, including the identification, assessment and mitigation of principal risks, and satisfying itself as to the effective oversight of risk management of individual risks by the Board or its committees through period reports from the

committee chair or management as appropriate. The Health, Safety and Environment and Reserves Committee (HSER Committee) provides direction and oversight of water related matters including water-related risk. The senior leadership team is accountable for the management of water-related risk and delegating management of specific risks throughout the organization. Continuous improvement is integral to MEG's compliance and EHS management system. As such, water risks, opportunities and mitigation strategies are monitored continuously and reported monthly MEG's corporate EH&S Committee and quarterly to the Board of Directors and HSER Committee. Potential material water risks are communicated to shareholders in MEG's AIF and other continuous disclosure documents publicly available on SEDAR. MEG uses a value-driven ERM philosophy to identify key strategic risks. ERM is integrated into strategic and business planning, operating practices, marketing, compliance monitoring, operating performance measurement and facility design. MEG's entire leadership team is engaged in evaluation and ranking of risk areas across the organization. Risks identified in MEG's assessments are tracked in a Corporate Risk Register and evaluated based on impact severity and likelihood of occurrence, based on the current and potential future operating conditions and business or political environment. Impact severity considers: financial impact to enterprise value and free cash flow, operational impact, environmental, safety, regulatory and reputational impact. Likelihood is ranked from remote to frequent. An overall Risk Rating is obtained by considering both impact severity and probability. Risks rated as 'low' are monitored by routine procedures and operations. Risks rated as 'catastrophic' require immediate risk treatment and mitigation plans. MEG defines substantive financial and strategic impact as the potential to materially change the value of the corporation. Strategic risk with the ability to impact value by 5% or more are considered material. Risks related to water are currently estimated to have a low impact on MEG (<5%); while loss of source water for a prolonged period would have a material negative impact on operations and cash flow, given that operations are proximal to abundant subsurface water supply, the regulatory and operational planning and degree of water recycling, management estimates that the probability of such an event is remote, accordingly the combination of impact and probability results in the risk being assessed as low. The reliance on MEG's value chain in terms of water is low. MEG is not dependent on third parties for water and does not operate in water stressed areas. An identified risk associated with the value chain is the potential for an incident along MEG's product transportation value chain. However, this exposure to this risk is deemed low and MEG carries adequate liability insurance in case of such an incident. The ERM process also identifies how the company currently mitigates risk and how it plans to mitigate risk in the future; including additional resource required. A partial list of current mitigations of the risks above includes: engineering design to mitigate potential physical risks, investment in technology to reduced water use and intensity, and enhanced disclosures. The ERM process helped drive the introduction of technological strategies to enhance bitumen recovery which also improve water (eMSAGP and eMVAPEX). In 2019 MEG continued to advance these technologies. MEG identified funding opportunities for the eMVAPEX pilot in part through government grants received from AI, NRCAN, ERA, and SDTC. Ongoing assessment of these contextual issues is conducted by The Water Strategy Committee. The committee is responsible for identifying potential and emerging risks and opportunities, developing mitigation strategies and monitoring performance of water activities. Topics such as regulatory changes, efficient water use and water availability among others are considered. The interdisciplinary team meets on a monthly basis.



## 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?**

MEG uses a risk matrix based on likelihood and impact severity to identify and assess potential risks. MEG defines substantive financial and strategic impact as the potential to materially change the value of the corporation. Strategic risk with the ability to impact value by 5% or more are considered material. Risks related to water are currently estimated to have a low impact on MEG (< 5%); while loss of source water for a prolonged period would have a material negative impact on operations and cash flow, given that operations are proximal to abundant subsurface water supply, the regulatory and operational planning and degree of water recycling, management estimates that the probability of such an event is remote, accordingly the combination of impact and probability results in the risk being assessed as low.

### 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	100	MEG currently operates one asset, the Christina Lake Regional Project (CLRP).

## 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**

Canada  
Mackenzie River

**Number of facilities exposed to water risk**

1

**% company-wide facilities this represents**

100%

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

100%

**% company's total global revenue that could be affected**

100%

**Comment**

MEG currently operates one asset, the Christina Lake Regional Project (CLRP).

## 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**

Canada  
Mackenzie River

**Type of risk & Primary risk driver**

Physical  
Increased water scarcity

**Primary potential impact**

Reduction or disruption in production capacity

**Company-specific description**

The availability of water supplies is a principle factor, amongst others, which could affect MEG's operating results. MEG CLRP facility requires water to produce steam which is injected to warm and soften bitumen so it can be pumped to the surface. Steam is generated from recycled produced water and make-up water. The risk is around the capacity of underground reservoirs that provide the make-up water. Make-up water is comprised of non-saline and saline water . These water sources are obtained from subsurface water supplies (aquifers) which include the Upper Clearwater Aquifer and McMurray Aquifer. The availability of water could pose a risk to current and future production.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium-high

**Likelihood**

Exceptionally unlikely

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

100,000,000

**Potential financial impact figure - minimum (currency)**

**Potential financial impact figure - maximum (currency)**

**Explanation of financial impact**

Estimated costs to source additional water, combined with some business interruption in the event of sudden change in the availability of one or more of MEG's current water sources. The estimate is based on current production levels and MEG's internal outlook on medium term commodity pricing and assumes resolution in approximately 1 month.

**Primary response to risk**

Increase investment in new technology

**Description of response**

MEG's current operations are located proximal to abundant subsurface water supplies. Through regulatory and operational planning, MEG ensures that sufficient water source wells are available to meet process requirements. MEG's operations recycle produced water which significantly reduces make up water requirements from these sources. MEG conducts regular maintenance on its water source infrastructure and recycling facilities, reducing probability of supply disruption. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water usage. The application of MEG proprietary technology eMSAGP has enabled MEG to achieve company-wide SOR of 2.22 in 2019 compared to the in situ industry average of 3.1. MEG continued the deployment of eMSAGP technology at the Christina Lake Phase 2B wells in 2019 and advanced the eMVAPEX pilot. eMVAPEX is a continuation of eMSAGP, which involves the injection of a solvent into the reservoir with the aim to further reduce the company's SOR beyond the decreases associated with the eMSAGP process. Technology development (eMSAGP, eMVAPEX) along with optimization projects have reduced water use intensities.

**Cost of response**

13,000,000

**Explanation of cost of response**

Cost of mitigation includes both the cost of on-going maintenance and investment towards eMVAPEX pilot in 2019, which is expected to ultimately reduce water intensity and exposure to water risk. Cost of response is based on actual incurred costs in 2019.

---

**Country/Area & River basin**

Canada  
Mackenzie River

**Type of risk & Primary risk driver**

Physical  
Severe weather events

**Primary potential impact**

Reduction or disruption in production capacity

**Company-specific description**

Event driven or longer-term shifts in climate patterns can result in physical risks. Principal factors which could affect MEG's operating results could include severe weather patterns or catastrophic events such as fires, lightning, earthquakes, extreme cold weather, storms or explosions and seasonal weather patterns and the corresponding effects of the spring thaw on accessibility to MEG's properties. There is a possibility that severe and seasonal weather patterns will change in the area where MEG operates causing damage to water associated infrastructure or cause operational upsets due to flooding.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium-low

**Likelihood**

About as likely as not

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

100,000,000

**Potential financial impact figure - minimum (currency)**

**Potential financial impact figure - maximum (currency)**

**Explanation of financial impact**

Estimated costs of repair or replace damaged water infrastructure combined with estimated cost of lost production during repair period, unmitigated by insurance coverage. It is estimate that any large scale outage could be repaired within approximately 1 month. The estimate is based on current production levels and MEG's internal outlook on medium term commodity pricing.

**Primary response to risk**

Other, please specify

Infrastructure maintenance

**Description of response**

Impacts of severe and seasonal weather patterns and the corresponding effects of spring thaw can cause damage to MEG's water infrastructure, impacts accessibility to that infrastructure and ultimately cause interruptions to production. There is a possibility that severe and seasonal weather patterns will change in the area that MEG operates due to climate change. These potential risks are identified in the ERM process and mitigated through engineering design and operational procedures. The design of MEG's facilities ensures that storm water run-off facilities have sufficient capacity to manage potential increases in flows and storm events. MEG also has extensive environmental monitoring programs for water and wetlands that will identify trends and support appropriate adaptation of operating practices and facilities. MEG's facilities are located in a geographical area that is not prone to significant weather events such as hurricanes or flooding. However, In order to better understand potential future physical risks MEG has updated the previous climate change assessment completed in 2008 with more recent data and modelling information from the latest Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5). The assessment update provided more recent climate trend comparisons locally and projections of changes in temperature, precipitation and other extreme events that could be expected out to 2050 and 2080. The intent of the revision was to support design reviews and develop

mitigation's (if necessary) to minimize the impacts of potential changes in environmental extremes.

**Cost of response**

50,000

**Explanation of cost of response**

The cost of response is the actual third party cost to complete the update of the physical change assessment. Results will be used to ensure ongoing preparation and proper facility design for the range of climate conditions that may be expected in the future. The third party cost is a onetime cost.

**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**

Canada  
Mackenzie River

**Stage of value chain**

Supply chain

**Type of risk & Primary risk driver**

Physical  
Pollution incident

**Primary potential impact**

Disruption to sales due to value chain disruption

**Company-specific description**

MEG's diluted bitumen product is shipped across North America for sale using pipelines and, at times, held in storage at one of several locations prior to sale. Purchased diluent is similarly transported across North America to MEG's production site at CLRP using pipelines. A spill of these transported products, if it were to occur into a body of water, could present significant environmental risk. To, date no such even has occurred.

Contamination of a waterway in the transportation system could have a substantive financial impact on MEG. Potential impacts include liability for cleanup costs or damages to third parties, realization of a discounted selling price on MEG's product, or a full suspension of MEG's production during a pipeline shut down In addition, there is the potential for adverse reputational impacts, including impacts on future development of pipeline systems and limitations on market access.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium-low

**Likelihood**

Exceptionally unlikely

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

180,000,000

**Potential financial impact figure - minimum (currency)**

**Potential financial impact figure - maximum (currency)**

**Explanation of financial impact**

Estimated lost cash flows resulting from an interruption of operations at CLRP under a foreseeable maximum loss scenario, unmitigated by insurance coverage. Estimate based on three month outage.

**Primary response to risk**

Upstream

Other, please specify

Prudent operations and liability and business interruption risk insurance

**Description of response**

MEG mitigates this exposure by contracting for transportation and storage with reputable and experienced operators with excellent safety records. In some circumstances, the transportation or storage contracts assign liability to the operator. In addition, MEG purchases insurance to protect against both the risk of an interruption of MEG's operations as well as MEG's potential liability to cleanup costs or damages to third parties. Reputable and experienced operators have excellent safety records and robust integrity/safety management systems (e.g. inspections, maintenance, operating processes) and emergency response protocols. In some circumstances, the transportation or storage contracts assign liability to the operator. In addition, MEG purchases insurance to protect against sudden and accidental environmental liabilities, including damages to third parties and remediation costs. Reputable and experienced operators have excellent safety records and robust integrity/safety management systems (e.g. inspections, maintenance, operating processes) and emergency response protocols. In some circumstances, the transportation or storage contracts assign liability to the operator. MEG's insurance protects against both the risk of an interruption of MEG's operations as well as MEG's potential liability to cleanup costs or damages to third parties.

**Cost of response**

0

**Explanation of cost of response**

The costs of integrity/safety management and emergency response systems are incurred by the operators and are embedded in the transportation and storage costs MEG pays pursuant to various agreements. MEG's insurance premiums to protect against these business interruption and liability risks exceed \$1 million per year.

## 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.**

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**Type of opportunity**

Efficiency

**Primary water-related opportunity**

Improved water efficiency in operations

**Company-specific description & strategy to realize opportunity**

MEG is focused of efficient bitumen production which includes the efficient use of water and is continuously looking for ways to reduce water use per barrel of oil and per tonne of steam generated, by increasing recycling of water within the facility. We identified a plant modification opportunity to change the make-up water type used by a clean backwash tank from non-saline water to produced water. This involves adding a tie-in from the saline water make-up system to the supply line to the tank, enabling MEG to use produced water as make-up water for the tank. This modification reduces non-saline water usage (by 1000 m3/day) , increases the recycling of produced water (by 1000 m3/day), as well as support regulatory disposal requirements.

**Estimated timeframe for realization**

Current - up to 1 year

**Magnitude of potential financial impact**

Low

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

100,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact**

This opportunity supports MEG strategy to reduce water intensity and increase efficiency of production – this has limited operating cost estimate. Incrementally, this modification enabled MEG to increase the amount of blowdown we can send to disposal. This reduces the amount of chlorides, OH alkalinity, high conductivity, TOC and magnetite we recycle back into the hot lime softener by recycling less blowdown. As a result, this reduces water treatment chemical use and cost. The financial impact estimate is the annual savings in chemical costs.

## **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.**

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**Facility reference number**



Facility 1

**Facility name (optional)**

Christina Lake Regional Project

**Country/Area & River basin**

Canada

Mackenzie River

**Latitude**

55.666

**Longitude**

-110.714

**Located in area with water stress**

No

**Oil & gas sector business division**

Upstream

**Total water withdrawals at this facility (megaliters/year)**

13,897

**Comparison of total withdrawals with previous reporting year**

About the same

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

53

**Withdrawals from brackish surface water/seawater**

0



**Withdrawals from groundwater - renewable**

600

**Withdrawals from groundwater - non-renewable**

0

**Withdrawals from produced/entrained water**

13,244

**Withdrawals from third party sources**

0

**Total water discharges at this facility (megaliters/year)**

13,641

**Comparison of total discharges with previous reporting year**

About the same

**Discharges to fresh surface water**

55

**Discharges to brackish surface water/seawater**

0

**Discharges to groundwater**

13,586

**Discharges to third party destinations**

0

**Total water consumption at this facility (megaliters/year)**

256

**Comparison of total consumption with previous reporting year**

About the same

**Please explain**

MEG currently only operates CLRP. All water withdrawals, discharges and consumption are monitored regularly (see W1.2). Total withdrawal volume remained about the same (9% higher from 2018) due to an increase in higher water volumes being returned to the facility. As such, MEG was able to recycle more volume of produced water, lowering the need to bring in as much make-up water to the plant. Although the total withdrawal remained about the same, the volumes of make-up water decreased. This also lowered total consumption of water (29% lower from 2018). The reduction in make-up water is also a result of optimization projects completed in 2018 and realized over 2019. This allowed MEG to stop using make-up to cool produced water and replace non-saline water with saline water as the primary make-up water source for steam. Total water discharge remained about the same as previous years (10% higher from 2018). The volume is only slightly higher from an increase in the amount of steam injected into the reservoir. Future withdrawal volumes are anticipated to increase as steam capacity and production increases, however, further reduction in water use intensities are expected from reservoir technology development and optimization projects. The future volumes of water discharge may increase slightly as steam capacity and produced water returns increase. Future implementation of a blowdown disposal evaporator which will improve water recycle capabilities and reduce blowdown disposal.

**W5.1a**

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

**Water withdrawals – total volumes**

---

**% verified**

Not verified

**Water withdrawals – volume by source**

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**% verified**

Not verified

**Water withdrawals – quality**

---



**% verified**

Not verified

**Water discharges – total volumes**

---

**% verified**

Not verified

**Water discharges – volume by destination**

---

**% verified**

Not verified

**Water discharges – volume by treatment method**

---

**% verified**

Not verified

**Water discharge quality – quality by standard effluent parameters**

---

**% verified**

Not verified

**Water discharge quality – temperature**

---

**% verified**

Not verified

**Water consumption – total volume**

---

**% verified**

Not verified



**Water recycled/reused**

% verified  
Not verified

**W6. Governance**

**W6.1**

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

No, but we plan to develop one within the next 2 years

**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
Chief Executive Officer (CEO)	The CEO is a member of the Corporation’s Board of Directors. The CEO, subject to the direction of the Board of Directors, is responsible for the general supervision and control over the business affairs of the Corporation including managing the Corporation’s ESG priorities, policies, procedures and practices, including water-related issues. In 2019, the Corporation established a cross-functional management committee focused on ESG issues. The ESG committee reports to the CEO and is tasked with supporting the Corporation’s ongoing commitment to ESG, corporate social responsibility and sustainability matters. Also in 2019, the Corporation adopted CEO objectives which are fully transparent to both employees and shareholders. The purpose of the CEO objectives is to set and ensure alignment on



	<p>the strategic objectives across the organization. The individual performance weighting contributes 20% of the CEO's short-term incentive compensation. The 2019 CEO objectives, which reflect the Corporation's commitment to continue to advance its water strategy, included the acceleration and improvement of the Corporations health, safety and environmental performance. Also reflecting the Corporation's commitment to continue to advance its water strategy, the 2020 CEO objectives focus on technological development innovation, include: significantly improve ESG performance and ratings, advance multiple technology solutions to achieve net-zero and set 2030 and 2050 carbon goals.</p>
<p>Other, please specify Board of Directors</p>	<p>The Board of Directors is responsible for the overall stewardship of the Corporation and for overseeing the conduct of the Corporation and activities of management who are responsible for the day-to-day conduct of the business. Under the its mandate, the Board is responsible to oversee ESG issues which impact the Corporation, including (a) overseeing and monitoring management systems and processes relating to the identification, assessment and management of ESG risks and opportunities, including water-related issues, greenhouse gas emissions, air and water impacts, and land and wildlife management, (b) developing the Corporations approach to corporate governance issues, principles, practices and disclosure; (c) approving and monitoring a code of business conduct and ethics for directors, officers, employees and contractors; (d) overseeing and monitoring of metrics and targets used by the Corporation to assess/ managed ESG risk/ opportunities; and (e) reviewing the ESG reports and other reporting on ESG matters. The Board discharges its responsibilities for ESG matters directly and through its committees. The Board has four standing committees: Audit committee, Compensation Committee, Governance and Nominating Committee (GNC) and Health, Safety and Environment Committee (HSER Committee). For example, the Compensation Committee assists the Board to ensure that ESG matters are reflected in compensation policies and guidelines as well as corporate goals and objectives related to compensation. The HSER Committee assists the board in fulfilling its stewardship with respect to ensuring compliance and applicable laws pertaining to environment including water use, and reviewing/ supervising MEG's policies and procedures designed to mitigate water risks/liabilities. In 2019 the Board approved the 2020 Corporate Performance Scorecard and CEO Objectives which water-related targets. The commitment to improved disclosure resulted in the publication of MEG's first ESG report.</p>

## W6.2b

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

Frequency that water-related issues are a	Governance mechanisms into which water-related issues are integrated	Please explain
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	scheduled agenda item		
Row 1	Scheduled - all meetings	<p>Monitoring implementation and performance</p> <p>Overseeing major capital expenditures</p> <p>Providing employee incentives</p> <p>Reviewing and guiding annual budgets</p> <p>Reviewing and guiding business plans</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Reviewing and guiding strategy</p> <p>Reviewing and guiding corporate responsibility strategy</p> <p>Reviewing innovation/R&amp;D priorities</p> <p>Setting performance objectives</p>	<p>The Board of Directors is responsible for the overall stewardship of the Corporation and for overseeing the conduct of the Corporation and activities of management who are responsible for the day-to-day conduct of the business. Under the Board of Directors mandate, the Board is responsible to oversee environmental, social and governance (ESG)s issues which impact the Corporation, including (a) overseeing and monitoring management systems and processes relating to the identification, assessment and management of ESG risks and opportunities, including water-related issues, greenhouse gas emissions, air and water impacts, and land and wildlife management, (b) developing the Corporations approach to corporate governance issues, principles, practices and disclosure; (c) approving and monitoring a code of business conduct and ethics for directors, officers, employees and contractors; (d) overseeing and monitoring of metrics and targets used by the Corporation to assess and managed ESG risk and opportunities; and (e) reviewing the Corporation's ESG reports and other reporting on ESG matters. The Board discharges its responsibilities for ESG matters directly and through its committees. The Board has four standing committees: Audit Committee, Compensation Committee, Governance and Nominating Committee (GNC) and HSER Committee. The Compensation Committee assists the Board to ensure that ESG matters are reflected in compensation policies and guidelines as well as corporate goals and objectives related to compensation. The HSER Committee assists the board in fulfilling its stewardship with respect to ensuring compliance and applicable laws pertaining to environment including water and reviewing and supervising policies and procedures designed to mitigate water risks/liabilities. In 2019 the Board approved the 2020 Corporate Performance Scorecard and CEO Objectives which increased the weighting of the HS&amp;E category from 15% to 25% to reflect importance within the overall strategy. The targets increased in stringency for both water related performance indicators: GHG Compliance Intensity and Reportable Spill Intensity, which create incentives for management of water related issues. Also in 2019, the Boards commitment to continued and improved disclosure resulted in the publication of MEG's first ESG report which discusses water performance.</p>



			<p>Other examples of actions include review and approval of continued investments in eMSAGP and eMVAPEX technologies. Reports on MEG’s water performance are provided to the Board and HSER Committee on a quarterly basis by the Director Environment &amp; Regulatory. In 2019, the Corporation established a cross-functional management committee focused on ESG issues. The ESG committee reports to the CEO and is tasked with supporting the ongoing commitment to ESG, provides guidance and oversight with respect to ESG strategy, priorities and corporate disclosures and is responsible for embedding ESG into practices and behaviors.</p>
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### 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)**

Safety, Health, Environment and Quality committee

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

The Corporate EHS Committee is responsible for providing guidance and oversight with respect to EH&S programs and consists of senior-most representatives from various business areas. Duties include: ensuring operations follow company environmental policies, assessing environmental conditions to ensure compliance with applicable regulatory agencies and ensuring compliance with various environmental agencies and for the protection of personnel, facilities and equipment. The committee assists MEG in carrying out its responsibilities by reviewing, reporting and making recommendations on policies, management systems and programs with respect to environment, including



water and exercising due diligence in ensuring such policies, systems and programs are implemented and functioning properly. The committee meets monthly to review reports and makes recommendations on policies, management systems and programs. Reports communicate water use, target performance, compliance and policy developments.

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

Sustainability committee

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

The ESG committee reports to the CEO and is tasked with supporting the ongoing commitment to ESG including water-related matters. Specific duties include (a) assist the CEO in setting MEG’s general strategy with respect to ESG, (b) to consider and recommend policies, practices and disclosures that reflect the strategy; (c) to oversee MEG’s reporting and disclosure with respect to ESG matters, including preparing MEG’s ESG and/or sustainability report; (d) assist the CEO in overseeing internal and external communications regarding MEG’s position to approach to ESG matters; (e) monitor and keep the CEO apprised of current and emerging ESG matters that may affect the business, operations, performance or public image of MEG or are otherwise pertinent to MEG and its stakeholders, make recommendations with respect to polices, practices and disclosure regarding such matters (f) assist in the identification, assessment and management of ESG-related risk/opportunities, including water.

**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 Chief Executive Officer (CEO) Chief Financial Officer (CFO) Chief Operating Officer (COO)	Improvements in efficiency - direct operations Other, please specify Pollution prevention	In 2019, the Corporation also adopted CEO objectives which are fully transparent to both employees and shareholders. The purpose of the CEO objectives is to set and ensure alignment on the strategic objectives across the organization. The individual performance weighting contributes 20% of the CEO's short-term incentive compensation. The 2019 CEO's objectives, which reflect the Corporation's commitment to water performance, included the acceleration and improvement of the Corporation's health, safety and environment performance. Also reflecting the Corporation's commitment to continue to advance its climate strategy. A portion of annual incentives are linked to environmental performance indicators including the management of water related issues. In 2019 this included Net GHG intensity and reportable spill intensity targets. MEG achieved the GHG intensity target threshold for 2019. The weight of the HS&E category increased from 15% to 25% in 2020 to reflect the importance of the category. The GHG target was adjusted and the stringency of the reportable spill target was increased. These two targets directly create incentives for management of water-related issues. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating more efficient steam utilization. By decreasing the amount of steam used, MEG is able to reduce its per barrel water usage. The spill intensity and successful regulatory inspection targets incentivize the protection of water bodies.
Non-monetary reward	No one is entitled to these incentives		

## 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

## 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?**

MEG values active engagement with government bodies to fairly represent the position of the organization and reports all lobbying activity in accordance with the Alberta lobbying act which requires periodic registration of lobbying activities. Reports are publicly available. A continuous legislative overview informs MEG of proposed changes. A multidisciplinary team regularly monitors developments in water policy and consolidates that information to ensure business interests are protected, and policy trends are understood. To ensure that corporate guidance on activities that influence policy are consistent with MEG's approach to addressing water risk, coordination meetings are held with all departments potentially influenced by the policy to review engagement opportunities and develop strategies if inconsistencies are identified. For example, the Water Strategy committee which is responsible for identifying potential and emerging risks and opportunities including regulatory changes. MEG engages directly with Government on policy and regulatory issues and provides input into new and existing policy, directives and regulations in order to properly reflect a balanced approach to sustainable development. MEG was an active participant in the development of the new AEP Surface Water Allocation Directive and in the development of the new AER water disposal limit calculations that came into effect November 5, 2019 under AER Directive 81.

## 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)



## 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	> 30	The availability and quality of water could impact MEG’s ability to achieve long-term business objectives. Issues such as water quality, quantity, regulatory frameworks, status of ecosystems and habitats as well as stakeholder concerns are initially captured through the EIA process. MEG then incorporates design features; management practices and mitigation plans to minimize the potential for adverse impacts. MEG also implements monitoring programs to ensure management of potential issues. Long-term water issues are aligned with the facility lifetime, about 60 years. MEG’s ERM process continues to identify water-related risks that could potentially be most significant to its long-term objectives. Risks are tracked in a Corporate Risk Register and evaluated based on impact and likelihood as well as current and potential future business and political environments. Mitigation strategies are updated by management and reviewed by MEG’s Board. MEG continuously monitors facility water performance and changes to regulatory requirements and regularly updates management and the Board. MEG’s overall long-term term business objective is optimizing the development of its resource focused on reducing SOR, a key measure of efficiency. A lower SOR indicating more efficient utilization. By decreasing the amount of steam used, MEG is able to reduce our per barrel water use. MEG’s strategy to achieve this include R&D investment to advance and implementation of reservoir recovery technologies.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	> 30	MEG’s strategic focus on technology drives efficiency gains throughout the organization including operating costs and environmental performance improvements including water performance as demonstrated by continued decrease in SOR. MEG continued the deployment of eMSAGP technology at the Christina Lake Phase 2B wells in 2019 and advanced the eMVAPEX pilot. This



			<p>strategy has enabled MEG to achieve an average SOR of 2.2 in 2019 compared to the in situ industry average of 3.1. The combined initial produced design capacity of MEG’s CLRP facility was approximately 60,000 bbl/d. MEG has been able to increase the overall production capacity to approximately 100,000 bbl/d through a series of low-cost debottlenecking and expansion projects and the redeployment of steam to new well pairs. MEG’s ERM process continues to identify water-related risks that could potentially be most significant to its long-term objectives. Risks are tracked in a Corporate Risk Register and evaluated based on impact and likelihood as well as current and potential future business and political environments. Mitigation strategies are updated by management and reviewed by MEG’s Board. MEG continuously monitors facility water performance and changes to regulatory requirements and regularly updates management and the Board.</p>
Financial planning	Yes, water-related issues are integrated	5-10	<p>MEG strategic focus on technology drives efficiency gains throughout the organization including operating costs and environmental performance improvements including water issues such as water use. This is demonstrated by continued decrease in SOR. SOR is a key measure of efficiency for SAGD projects, with a lower SOR indicating that steam is more efficiently utilized. By decreasing the amount of steam used, MEG is able to reduce our per barrel water usage. The application of MEG proprietary technology eMSAGP has enabled MEG to achieve an average SOR of 2.2 in 2019 compared to the in situ industry average of 3.1. MEG continued the deployment of eMSAGP technology at the Christina Lake Phase 2B wells in 2019 and advanced the eMVAPEX pilot. Technology development along with optimization projects have reduced water use intensities and further reductions are anticipated. Capital continues to be allocated to optimization projects including eMSAGP and eMVAPEX which integrate water-related issue considerations. The combined initial produced design capacity of MEG’s CLRP facility was approximately 60,000 bbl/d. MEG has been able to increase the overall production capacity to approximately 100,000 bbl/d through a series of low-cost debottlenecking and expansion projects and the redeployment of steam to new well pairs.</p>

**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)**

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

**Water-related OPEX (+/- % change)**

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

**Please explain**

### W7.3

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

	Use of climate-related scenario analysis	Comment
Row 1	No, but we anticipate doing so within the next two years	

### W7.4

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

Row 1

**Does your company use an internal price on water?**



Yes

**Please explain**

In evaluating future operations, MEG’s operating and maintenance costs are estimated based on the assumption that MEG will maintain or increase the percentage of total water that is recycled in its operations. This may include future capital projects to managed produced water from the reservoir.

## 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 Site/facility specific targets and/or goals Basin specific targets and/or goals	Targets are monitored at the corporate level	MEG considers risks with the potential for substantive impacts to MEG’s operating results and long-term business objectives when identifying and setting company and facility specific target. Targets are also identified based on CEO objectives, are in line with long-term business objectives and defined and proposed by subject matter experts and approved by the executive team and the board. The availability of water supplies is a principle factor, amongst others, which could affect MEG’s operating results. MEG CLRP facility requires water to produce steam for bitumen. Steam is generated from recycled produced water and make-up water. The risk is around the capacity of underground reservoirs that provide the make-up water. Make-up water is comprised of non-saline and saline water . These water sources are obtained from subsurface water supplies (aquifers) which include the Upper Clearwater Aquifer and McMurray Aquifer. The availability of water could pose a risk to current and future production. MEG has set company targets to mitigate the water availability risk which include pollution prevention of water sources and efficient use of water. These create incentives for management of water and include reductions in GHG intensity and spill prevention. The targets are GHG Compliance Intensity and reportable spill intensity. These goals are part of the Health,

			<p>Safety, and Environment corporate performance indicators which are linked to a portion of all employee annual incentives. Progress is communicated monthly to management and quarterly to the Board of Directors. The 2020 Corporate Performance Scorecard increased the weighting of the HS&amp;E category from 15% in 2019 to 25% in 2020 to reflect its importance within the overall business strategy. The stringency of the aforementioned targets increase annually. MEG complies with all regulatory requirements and also sets targets to mitigate the risk of regulatory related water violations. Regulatory requirements include the AER Directive 081 Water Disposal Limits and Reporting Requirements for Thermal In Situ Oil Sands Schemes which outlines water management requirements for the thermal in situ oil sands (SAGD) operations. It sets water disposal limits, which require operators to recycle produced water efficiently and ensure that make-up water is effectively used. Efficient water treatment, recycle, and disposal at thermal operations optimizes overall water use and energy efficiency. The directive establishes a maximum water disposal limit and is a MEG annual target. This target intends to ensure efficient recycling of produced water.</p>
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## 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 recycling/reuse

**Level**

Site/facility

**Primary motivation**

Reduced environmental impact

**Description of target**

MEG complies with the AER Directive 081 Water Disposal Limits and Reporting Requirements for Thermal In Situ Oil Sands Schemes which outlines water management requirements for the thermal in situ oil sands (SAGD) operations. It sets water disposal limits, which required operators to recycle produced water efficiently and ensure that make-up water is effectively used. Efficient water treatment, recycle, and disposal at thermal operations optimizes overall water use and energy efficiency. The directive establishes a maximum water disposal limit and is a MEG annual target. This target intends to ensure efficient recycling of produced water and reducing the need for make-up water consumption. This helps achieve water security by reducing the amount of water needed for steam purposes.

**Quantitative metric**

Other, please specify

Water disposal limit (%)

**Baseline year**

2018

**Start year**

2019

**Target year**

2019

**% of target achieved**

100

**Please explain**

Targets under AER Directive 081 Water Disposal Limits and Reporting Requirements for Thermal In Situ Oil Sands Schemes are annual. MEG met both the maximum disposal limit and the recycle requirements in 2019.

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**Target reference number**

Target 2



**Category of target**

Water consumption

**Level**

Site/facility

**Primary motivation**

Reduced environmental impact

**Description of target**

MEG complies with the AER Directive 081 Water Disposal Limits and Reporting Requirements for Thermal In Situ Oil Sands Schemes which outlines water management requirements for the thermal in situ oil sands (SAGD) operations. It sets water disposal limits, which required operators to recycle produced water efficiently and ensure that make-up water is effectively used. Efficient water treatment, recycle, and disposal at thermal operations optimizes overall water use and energy efficiency. This target intends to ensure efficient recycling of produced water and reducing the need for make-up water consumption. This helps achieve water security by reducing the amount of water needed for steam purposes.

**Quantitative metric**

Other, please specify  
% water recycled

**Baseline year**

2018

**Start year**

2019

**Target year**

2019

**% of target achieved**

100

**Please explain**

MEG achieved a make-up water withdrawal intensity of approximately 77% below industry average in 2019.

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**Target reference number**

Target 3

**Category of target**

Water pollution reduction

**Level**

Company-wide

**Primary motivation**

Reduced environmental impact

**Description of target**

Spills are one of the most common environmental incidents that can be encountered across operations and are considered reportable if they are released into a watercourse, groundwater or surface water in quantity. MEG has adopted a reportable spill intensity to ensure ongoing protection of water bodies.

**Quantitative metric**

Other, please specify

Reportable spill intensity

**Baseline year**

2018

**Start year**

2019



**Target year**

2019

**% of target achieved**

100

**Please explain**

In 2019 the reportable spill intensity achieved was approximately 22% better than the corporate target.

## 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, we are waiting for more mature verification standards and/or processes

## 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
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Row 1	Chief Executive Officer (CEO)	Chief Executive Officer (CEO)
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## 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 am submitting to	Public or Non-Public Submission
I am submitting my response	Investors	Public

**Please confirm below**

I have read and accept the applicable Terms