

# Welcome to your CDP Climate Change Questionnaire 2020

## C0. Introduction

### C0.1

#### **(C0.1) Give a general description and introduction to your organization.**

Vermilion is playing a meaningful role in the energy transition that is unfolding globally, & we are doing so with an unwavering commitment to our priorities of health & safety, environmental protection, & economic prosperity. Vermilion is an international energy producer that seeks to create value through the acquisition, exploration, development & optimization of producing properties in North America, Europe & Australia. Our business model emphasizes free cash flow generation and returning capital to investors when economically warranted, augmented by moderate organic production growth and value-adding acquisitions. Vermilion is targeting growth in production primarily through the exploitation of light oil and liquids-rich natural gas conventional resource plays in Canada & the United States, the exploration & development of high impact natural gas opportunities in the Netherlands, Ireland, Germany, Hungary, Slovakia, Croatia, & through oil drilling & workover programs in France & Australia. Vermilion holds a 20% working interest in the Corrib gas field in Ireland, & assumed operatorship of the asset in late 2018. Vermilion's ongoing reserve & production growth is anticipated to come from a combination of development drilling, reservoir optimization & strategic acquisitions. The long-term goal is to deliver balanced growth & income to investors.

Vermilion remains a conventional producer in Europe, not employing hydraulic fracturing in any of our operated European assets. In North America, we do utilize hydraulic fracturing of horizontal wells to develop some of our oil & gas reservoirs. However, we would point out that even in North America, we use fracturing at lower fracturing intensity than is typical of the industry, & only in semi-conventional clastic reservoirs. We do not develop shale reservoirs.

One of Vermilion's defining strengths is our belief that sharing our success is essential to being a success. We have embedded this philosophy in our mission, & we continue to live it today. Our objective is to ensure that all of our key stakeholders – our shareholders, employees, communities, & partners – benefit from our achievements. This approach, based on the concepts of inclusive & sustainable growth, frames our business strategy & guides our role in the energy transition. As the energy transition continues to advance, two avenues of action have become increasingly important to us.

First, it is of course critical that we continue to develop & expand the implementation of reliable, secure & cost-effective sources of renewable energy. Our geothermal projects in France, in which we provide heat from our produced water to agricultural and residential sectors, are already demonstrating that oil & gas companies such as ours can not only participate in

renewable energy production, but lead it as well. We are actively working on geothermal development in concert with hydrocarbon production in the Netherlands as well. Second, because hydrocarbons, particularly natural gas, will be required until the energy transition is completed, we believe that citizens, governments & investors should turn to best-in-class oil & gas operators. We will need to continue produce safely & responsibly the oil & gas that is still needed to fuel essential products & services. In particular, natural gas has a role to play by replacing high-carbon fuels such as coal for electricity generation, which will become increasingly important as the number of electric vehicles increases. In 2010, our natural gas offset more than 2.9 million tonnes of greenhouse gas emissions in Canada alone, as compared to coal consumption.

In our operating regions of North America, Europe & Australia, we comply with some of the world's most stringent health, safety, environmental & human rights regulations. We voluntarily report to international frameworks such as GRI & CDP. Environmental responsibility is only a part of our sustainability focus. We have seen first hand that inclusive growth, which we see as ensuring that everyone has an opportunity for economic advancement, is fundamental to community wellbeing & long-term democratic stability. We are therefore committed to ensuring that we produce energy in the most socially responsible manner possible, respecting worker rights & community engagement. This broad focus on sustainability (environmental, economic & social) is why we have integrated our sustainability strategy with the UN's Global Goals for Sustainable Development (SDGs). The SDGs provide a common focus & language for the planet, stating a clear vision for our collective future. We recognize that our capabilities in health and safety, environmental stewardship, long-term economic growth generation, & creation of shareholder value provide us with opportunities and the responsibility to move the SDGs forward. You'll see us referring to the SDGs throughout the submission and other sustainability reporting.

## C0.2

**(C0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Reporting year	January 1, 2019	December 31, 2019	No

## C0.3

**(C0.3) Select the countries/areas for which you will be supplying data.**

- Australia
- Canada
- France
- Germany
- Hungary
- Ireland
- Netherlands
- United States of America

## C0.4

**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

CAD

## C0.5

**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.**

Operational control

## C-OG0.7

**(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?**

Row 1

**Oil and gas value chain**

Upstream

**Other divisions**

## C1. Governance

### C1.1

**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

### C1.1a

**(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	Please explain
Board-level committee	Integrated Sustainability is an important component of our long-range business plan because sustainability impacts every business unit, department and employee. Led by the Executive Chair, the Board has responsibility for oversight of Vermilion's sustainability performance, including climate-related issues, with Board committees providing additional sustainability-related expertise

	<p>in their areas of focus, including: the Governance and Human Resources (GHR) Committee, the Audit Committee, and the Health Safety and Environment (HSE) Committee, and in particular the Sustainability Committee. Comprised of four independent directors, the Sustainability Committee provides targeted oversight and advice of Vermilion’s approach, including:</p> <ul style="list-style-type: none"> <li>- our Sustainability Policy and long-range strategic plan, including climate;</li> <li>- sustainability performance, and progress on sustainability-related goals, including those related to climate;</li> <li>- identification and management of sustainability-related risks and opportunities, including those related to climate;</li> <li>- impact of climate-related issues on business strategy, budgets and risk management; and</li> <li>- communication of sustainability policies and performance, including those related to climate.</li> </ul> <p>The Board reviews sustainability performance reports quarterly, which include climate risks, opportunities and performance, other ESG performance, sustainability activities, environmental and social trends, and strategic community investment activities.</p>
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## C1.1b

**(C1.1b) Provide further details on the board’s oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	<ul style="list-style-type: none"> <li>Reviewing and guiding strategy</li> <li>Reviewing and guiding major plans of action</li> <li>Reviewing and guiding risk management policies</li> <li>Reviewing and guiding annual budgets</li> <li>Reviewing and guiding business plans</li> <li>Setting performance objectives</li> <li>Monitoring implementation and</li> </ul>	<p>As a responsible energy producer, we believe we can best deliver long term shareholder value by operating in an economically, environmentally &amp; socially sustainable manner that recognizes the importance of all our stakeholders. Integrating sustainability principles into our business is the right thing to do: we believe it increases shareholder returns, enhances business development opportunities &amp; reduces long-term risks to our business model.</p> <p>Led by the Executive Chair, the Board has responsibility for reviewing all issues including climate-related &amp; their implications for business strategy. The Board Sustainability Committee assists with oversight, &amp; in 2019:</p> <ul style="list-style-type: none"> <li>- Reviewed Vermilion’s long-range sustainability strategy &amp; plans, including the sustainability materiality</li> </ul>

	<p>performance of objectives</p> <p>Overseeing major capital expenditures, acquisitions and divestitures</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>analysis &amp; associated risks &amp; opportunities such as climate change &amp; human rights, how these risks are integrated into our enterprise risk management system, &amp; how sustainability is integrated into our operations</p> <ul style="list-style-type: none"> <li>- Participated in Vermilion's scenario analysis to assess the potential trajectory and impacts of the speed of the energy transition</li> <li>- Reviewed our sustainability performance via ratings agencies including CDP, SAM, Sustainalytics, MSCI, ISS &amp; Vigeo</li> <li>- Reviewed recommendations from the TCFD &amp; CCGG &amp; their addition to our regulatory reporting</li> <li>- Reviewed Board skills &amp; sustainability skills matrices to ensure related skills &amp; experience, including climate-related issues such as emissions reduction, regulatory frameworks, renewable energy &amp; stakeholder engagement</li> <li>- Reviewed our sustainability reporting from performance to publication</li> <li>- Recommended a human rights policy for our Code of Business Conduct and Ethics</li> <li>- Reviewed our approach to lobbying</li> <li>- Reviewed our strategic community investment, including global emergency responder &amp; environmental stewardship programs</li> <li>- Recommended guest speakers with sustainability expertise, including climate change and ESG investment context, for Board continuing education, along with scientific &amp; thought leadership papers</li> <li>- Visited Vermilion's field operations in Canada, Ireland &amp; France, with stakeholder engagement including staff &amp; community representatives</li> <li>- Approved the committee TOR &amp; sustainability contents for the 2020 Information Circular</li> </ul> <p>The Board meets quarterly, with Sustainability discussions at each meeting &amp; Sustainability Committee meetings at least 3 times/year. Other Board committees review sustainability issues, including climate-related, for impacts in their areas. The Board reviews sustainability performance reports quarterly, which include ESG performance, sustainability activities, environmental &amp; social trends, &amp; community investment activities.</p> <p>The Board &amp; the Sustainability Committee use this information to ensure the integration of sustainability &amp;</p>
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		climate-related risks within our enterprise risk management system, to better inform decisions and provide direction on policy, business strategy & risk mitigation .
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## C1.2

**(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.**

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify Executive Chair	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
President	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Financial Officer (CFO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Operating Officer (COO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Other C-Suite Officer, please specify Executive VP, People & Culture	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Business unit manager	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Sustainability committee	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Other, please specify Director, Corporate HSE	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Other, please specify Director, Sustainability	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).**

The Board has responsibility for reviewing all material risks, including climate-related, & their implications for our business strategy. Vermilion's Board independently reviews the effectiveness of our identification & management of risk quarterly, along with mitigation strategies and associated opportunities, through its five committees. Organizational responsibility for sustainability and climate-related risks flows from the Board to our Executive Chair and our President, & throughout the Company via our Executive Committee, which comprises the Chair, President, COO, CFO, EVP People & Culture, VP Business Development, VP Europe, VP Strategic Planning & VP Canada Business Unit. Our Executive Committee is responsible for review & management of the Enterprise Risk Management process.

Our Sustainability Steering Committee, comprising our Executive VP, People & Culture (responsible for sustainability); Chief Operating Officer (responsible for HSE); Director, HSE; & Director, Sustainability, focuses on integrating sustainability throughout our business, including identifying & managing associated risks & opportunities, particularly climate-related. An additional committee focuses on integrating sustainability including climate risks into our Enterprise Risk Management framework, & comprises our CFO; Director, Corporate HSE; Director, Sustainability; & Manager, Finance.

Our corporate sustainability team, led by our Director, Sustainability, provides a Centre of Excellence approach, advising the business on all aspects of sustainability & reporting at least quarterly to the Board. Managing Directors of our business units (BUs) have responsibility for assessing & managing sustainability (including climate) risks & opportunities in their regions. This work is aided by risk identification & management by BU public & government relations staff focusing on our external stakeholders; in addition, each BU has a Sustainability Lead to coordinate sustainability-related work.

Various departments report sustainability-related priorities & progress quarterly to either the full Board or Board committees, including governance updates, HSE targets & performance, public & government relations & strategic community investment. In addition, management provides the Board, Sustainability Committee or Board members with additional information when requested between scheduled meetings.

Sustainability-related risks & opportunities, including climate-related, are identified by key staff, including our HSE team, Sustainability team, Government & Public Relations teams, & BU leaders. These staff have significant experience, & gather a wide array of inputs that inform our analysis. These include research reports, external stakeholder organizations, government policy & regulation discussions, industry initiatives, communities & landowners, & non-governmental entities.



The management of climate-related responsibility & programs sits directly with the HSE & Sustainability teams, who provide quarterly reports to the Board, incorporating feedback & insight from our internal experts as described above & our external stakeholders.

The COO, Director Corporate HSE & Manager Corporate HSE brief the Board’s HSE committee, & the EVP People & Culture & Director Sustainability brief the Board’s Sustainability Committee. These committees meet at least three times a year, in addition to a full Board strategy meeting & quarterly Board meetings, allowing senior management to take various initiatives, research/results & other information to the Board to validate operational/policy change or organizational direction. The Executive Committee, the Board and its committees also conduct site visits to oversee & support sustainability initiatives while giving staff an opportunity to exchange with Senior Management and Directors on sustainability achievements and needs.

### C1.3

**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	<p>Our compensation approach is one program for all to incentivize staff at every level to work toward our strategic objectives, including climate-related issues. Comp. program elements include base salary &amp; short-term &amp; long-term incentives, which we believe strengthens our organizational alignment with shareholder expectations. Our objectives are:</p> <ul style="list-style-type: none"> <li>- ensuring our operations worldwide are sustainable under a range of commodity price environments &amp; when changes occur in our workforce;</li> <li>- aligning compensation programs with our strategy to ensure prudent risk taking;</li> <li>- allowing us to attract &amp; retain high-calibre employees that are important to our success</li> <li>- rewarding all employees &amp; executives when their performance &amp; the Company’s performance is top quartile.</li> </ul> <p>We measure Company performance annually using our balanced scorecards, which include climate-related measures. Company &amp; individual performance are used to determine annual short-term incentive awards &amp; annual grant of share awards.</p>



### C1.3a

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).**

Entitled to incentive	Type of incentive	Activity incentivized	Comment
All employees	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Behavior change related indicator Supply chain engagement Company performance against a climate-related sustainability index	<p>Employee compensation is tied directly to performance targets, including those related to sustainability and climate, through our corporate performance scorecards, which are the same for employees &amp; executives. Achievements within the short-term incentive plan (STIP, or bonus) &amp; long-term incentive plan (LTIP) scorecards also help determine STIP &amp; LTIP budgets overall.</p> <p>The 2019 corporate performance scorecards included both standard industry metrics &amp; internal measures of performance which were compared to management plans approved by the Board. Our STIP scorecard (past year performance) includes a 25% weighting on HSE Performance, including climate-related goals such as HSE inspections, compliance / regulatory inspections, and spills.</p> <p>We believe there is a direct link between sustainability performance, including climate performance, &amp; overall business performance, &amp; we expect sustainability performance to be a very significant factor in the long-term viability of our economic model, driven by increased emphasis on EESG impacts. Our 2019 LTIP corporate performance scorecard includes a sustainability-specific measure to illustrate to our organization the importance of this measure, &amp; to incentivize all staff to focus on sustainability performance in their daily work. We are measuring our performance relative to our peer group in three, third-party sustainability rankings: CDP, SAM and Sustainalytics. This holds a 10% weighting &amp; applies to all employees. Individual employees with specific performance targets relating to sustainability &amp; emissions management &amp; reporting have also been identified.</p> <p>Because overall employee compensation is linked</p>

			to sustainability index performance, every employee is able to influence our score through activities ranging from energy conservation to recycling, all of which have a climate impact. In addition, specific facilities and operations staff in are assigned to the energy and emissions efficiency and reduction projects that are an integral part of our emissions targets, such as in Saskatchewan and France, while the admin team has taken on trash reduction and reduced plastics use, all of which has a positive climate impact. We continued to provide additional focus on sustainability across all BUs in 2019, including impacts included for capital projects, climate-risk assessments and carbon liability measures.
All employees	Non-monetary reward	Emissions reduction project Energy reduction project Efficiency project Behavior change related indicator	Recognition is provided to groups & individual employees by managers & executive based on performance & project specific successes. Our Extraordinary Effort recognition program also provides small monetary rewards when staff have contributed significantly to project success, including environmental/energy efficiency projects for sites such as those associated with former Spartan assets and the rollout of a future-forward assessment of business strategy in France.
Corporate executive team	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Behavior change related indicator Supply chain engagement Company performance against a climate-related	Executive compensation is tied directly to sustainability-related performance targets, including climate-related, through our corporate performance scorecards, which are the same for employees & executives. Achievements within the short-term incentive plan (STIP, or bonus) & long-term incentive plan (LTIP) scorecards also help determine STIP & LTIP budgets overall.  The 2019 corporate performance scorecards included both standard industry metrics & internal measures of performance which were compared to management plans approved by the Board. Our STIP scorecard (past year performance) includes a 25% weighting on HSE Performance, including climate-related goals such as HSE inspections, compliance / regulatory inspections, and spills.  We believe there is a direct link between sustainability performance, including climate

		<p>sustainability index</p>	<p>performance, &amp; overall business performance, &amp; we expect sustainability performance to be a very significant factor in the long-term viability of our economic model, driven by increased emphasis on EESG impacts. Our 2019 LTIP corporate performance scorecard includes a sustainability-specific measure to illustrate to our organization the importance of this measure, &amp; to incentivize executives to focus on sustainability performance in their daily work. We are measuring our performance relative to our peer group in three, third-party sustainability rankings: CDP, SAM and Sustainalytics. This holds a 10% weighting &amp; applies to all executives. Individual executives with specific performance targets relating to sustainability &amp; emissions management &amp; reporting have also been identified.</p> <p>Because overall executive compensation is linked to sustainability index performance, every employee is able to influence our score through their leadership of activities ranging from energy conservation to recycling, all of which have a climate impact. In addition, they have assigned specific facilities and operations staff to the energy and emissions efficiency and reduction projects that are an integral part of our emissions targets, such as in Saskatchewan and France, and the admin team to trash reduction and reduced plastics use, all of which has a positive climate impact. This is supported by additional work tasked to business unit leadership on carbon liability and climate risk integration.</p>
Board/Executive board	Monetary reward	Company performance against a climate-related sustainability index	<p>Compensation is determined in light of current market conditions and competitive practices, having regard to our pay-for-performance compensation philosophy, which includes comparison of company performance against three climate-related indices: CDP, SAM and Sustainalytics.</p> <p>Each year, the GHR Committee reviews the compensation paid to directors against industry practices for oil and gas companies of similar business model, size and scope. The peer group used to measure directors' compensation is the</p>

		<p>same group used to measure corporate performance. Retainers are targeted at the median of the market.</p> <p>The total director compensation package recognizes the increasing responsibilities, time commitments and accountability of Board members. We conduct a review of director compensation annually to ensure we are providing a compensation package that allows us to attract and retain competent members to our Board. Recommendations are then made to the Board. Changes to retainers (if any) are approved by the Board of Directors.</p> <p>Effective January 1, 2019, directors no longer participated in the employee long-term incentive plan (VIP) and were no longer eligible to receive performance share award grants. This change aligns the Corporation with best governance practices to eliminate the issuance of performance share awards to non-employee directors. They do, however, receive retainers based on their committee and chair duties, including the members of the sustainability committee.</p> <p>The GHR Committee ensures that each member of the Board, the committees, the Chair of the Board, and the Lead Director are assessed annually in light of their relevant terms of reference. The assessments are done by way of a questionnaire conducted by our external legal counsel Norton Rose Fulbright.</p>
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## C2. Risks and opportunities

### C2.1

**(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?**

Yes

### C2.1a

**(C2.1a) How does your organization define short-, medium- and long-term time horizons?**

	From (years)	To (years)	Comment
Short-term	0	3	Short term is considered to be current year to 3 years.
Medium-term	3	6	Medium term is considered to be 3 to 6 years from the current year.
Long-term	6	50	Long term is considered to be 6 to 50 years from the current year.

## C2.1b

### (C2.1b) How does your organization define substantive financial or strategic impact on your business?

Our Enterprise Risk Management system includes a corporate risk register in which we maintain records of all identified risks to our business and our operations. Within the risk register, in addition to descriptions of the background and context of the risk, we use a risk matrix – approved by our Executive and Board of Directors – to identify the potential magnitude of the financial or strategic impact of each identified risk on our business. The risk matrix is used to establish impact thresholds across a broad range of risk categories, including people, environment, business loss, reputation, regulatory, security. We define substantive financial or strategic impact as part of this risk matrix, to ensure that the risks with the highest potential impact are appropriately managed.

As per our matrix, financial impact is deemed substantive if it could cause a business loss of more than \$10 MM CAD (unrisks & before mitigation/recovery instruments)

A strategic impact is defined as substantive beginning at the following levels and including any escalations if it:

- Has persistent but reversible, long term effects on habitat, ecological communities, land, air, or water. Escalations include irreversible effects on these elements, persistent reduction in sensitive ecosystem function, or effects beyond a regional or operations scale.
- Requires a specific asset to be shut in for unknown duration during regulatory or legal proceedings. Escalations include the permanent withdrawal of authority to operate.
- Has reputational damage nationally or internationally and where stakeholder concerns lead to regional or more widespread interruption of operations.

Potential impacts to our business are also assessed within the risk matrix and the corporate risk register in terms of likelihood in order to quantify or qualify risk exposure to the organization and determine order of priority in which these risks will be managed. Other measures such as speed of onset and organizational vulnerability are risk qualifiers that are also used to help us with our risk ranking process to provide greater context for risk management.

## C2.2

### (C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

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**Value chain stage(s) covered**

Direct operations

**Risk management process**

Integrated into multi-disciplinary company-wide risk management process

**Frequency of assessment**

More than once a year

**Time horizon(s) covered**

Short-term

Medium-term

Long-term

**Description of process**

Identifying

We use our Enterprise Risk Management (ERM) System, with its Corporate Risk Register & Risk Matrix, to identify, assess & monitor new & emerging climate-related risks on an ongoing basis, updating the Register as needed but annually at minimum. Climate-related risks are viewed with short- (e.g. severe weather) mid- and long-term (e.g. rising sea levels) contexts, to the end of asset reserve life. Our ERM process is based on a Top-Down, Bottom-Up approach to engage all staff. Top-Down begins with our Board and its committees with clear terms of reference, including specific allocation of risk type. Our Executive Committee reviews & manages the ERM process. Our staff helps develop systems, standards and procedures. Bottom-Up is how staff implement, maintain & improve risk management processes, applying the hazard-risk-mitigation process in every part of our business, with our Executive Committee and Board providing oversight on key risks & broad issues of corporate governance & regulatory compliance.

Assessing

The ERM process is integral to decision making & is regularly reviewed, with action taken to manage risks. At the asset level, risk is assessed & managed with input from technical teams, leadership & Corporate groups. This ensures that we effectively identify existing or emerging risk within each operating region, including the integrated nature of many risks. For each risk case, our subject matter expert teams, BU leadership, Executive Committee & Board of Directors (depending on the risk) assess scope & materiality, anticipated severity & probability in terms of human, environment, financial & social license impacts. Substantive financial impact is defined as exceeding \$10MM CAD (before mitigation/recovery). Risk profiles include Operational, Market & Financial, Credit, Organizational, Political, Regulatory Compliance, Strategic & Reputational, & Sustainability (added in 2019 as context for managing long-term risks including climate). Each risk case is entered into the Corporate Risk Register, which tracks all material risks & communicates risks & mitigation plans throughout the business.

At a minimum annually & more frequently when required (e.g. daily during cyclone season), we reassess risk associated with climate change, including the impact of a 1-5 to 2oC scenario:

- Changes in temperature & precipitation extremes
- Sea level rise
- Tropical cyclones (hurricanes & typhoons)
- Carbon taxation
- Carbon sequestration
- Emission reporting obligations
- Product efficiency regulations & standards
- Uncertainty surrounding new regulation
- Legal,
- Technology,
- Reputation &
- Changing consumer behaviour

In 2017, to support climate risk ID & management, we developed a Carbon Liability Assessment Tool, with Scope 1 emissions quantification & regulatory information for each BU. We assess carbon price on both a realized cost & shadow pricing basis & have identified likely carbon pricing scenarios for all operated areas. Updated annually, the Tool provides an overview of our exposure & the basis for developing carbon liability risk cases for all BUs in 2019, & supports ongoing id of carbon opportunities & activities such as business development, taxation review & marginal abatement cost curve prep.

In 2018, every BU conducted a review of climate-related risks, including where climate-related risk is a contributing factor to other risks and vice versa. These were quantified, including implications & mitigating measures to reduce risk & liabilities to an acceptable & manageable level. Results were provided to the Board's HSE, Audit & Sustainability Committees, including timelines & mitigation/opportunity. This formalizes identification & assessment of climate-related risks & integrates them into the ERM system, supporting the Board's oversight.

In 2019, we integrated the results of GRI's sustainability matrix approach (external stakeholder concerns & internal company impact) into our Risk Matrix, which resulted in the addition of Sustainability as a distinct risk category in both the Risk Matrix and the Corporate Risk Register, elevating the profile of climate-related issues identification, assessment & mitigation.

#### Managing

Our ERM framework allows us to identify mitigation activities to reduce risk to a level as low as reasonably practicable, or to accept or control risk including potential impact, financial implications, management methods & cost, and to support our energy transition strategy. For climate-related risks & opportunities, we prioritize reducing the risk to our people, the environment & the company. If direct mitigation is not possible (i.e. changes in temperature extremes), we adapt our business processes to reduce the potential



impact. If this is not practical, we may accept the risk, insuring our operations against it wherever possible. Senior levels of management, including our Board, have a direct link to our risk management processes & activities, & required changes can be made, including shifts in the organizational direction/structure. Where climate opportunities are identified, they are advanced using our project management framework, which follows several phases to assess costs, benefits, and implementation paths.

As an example of risk response, following our assessment of mid to long-term climate-related issues in 2015, the Board & Executive changed our organizational structure by making Integrated Sustainability 1 of 6 Strategic Objectives within our Strategic Business Plan, aligning us with the UN SDGs. The associated transition risk is the potential for change in favourability of market conditions. During the energy transition, responsible oil & gas producers will be needed to provide energy, both hydrocarbon & renewable such as geothermal, to the market. We believe our record of reducing emissions while optimizing production sets us apart as an industry-leading producer to actively contribute to the energy transition. Our ongoing risk assessment also led to establishing a Board Sustainability Committee in 2018 & climate reporting in regulatory filings (Information Circular, Annual Report), aligning with TCFD.

Vermilion conducts operational & engineering reviews aimed at increasing efficiency, reducing emissions & expense requirements at major facilities, which has identified a large number of climate-related opportunities. Mitigating actions are guided by our Management of Change process, specific to the situation.

An example of a physical risk that has been quantified & accepted for our operations is increased weather events & their potential impact on offshore assets (I.e. cyclone on Wandoo B platform in Australia). To mitigate associated impacts, we have done extensive engineering work for re-living this infrastructure, adjusted our operating procedures, and arranged financial instruments to mitigate the potential for loss due to damage.

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**Value chain stage(s) covered**

Upstream

**Risk management process**

Integrated into multi-disciplinary company-wide risk management process

**Frequency of assessment**

More than once a year

**Time horizon(s) covered**

Short-term

Medium-term

Long-term

**Description of process**

Vermilion includes assessment of upstream climate related risk within our integrated risk framework, described in the 'direct operations' text above, but covering climate-related risks and opportunities in our upstream value chain, including governments, regulators, partners & suppliers. Our response in this section of text deals specifically with the upstream risk category.

Overall, we prioritize risk & opportunities based on the materiality, probability & potential impact to our operations. Impact to the environment as well as financial and strategic implications of identified climate change risks & potential project opportunities are built into the ERM process, with every risk in our Risk Register being assessed for its potential impact on climate change. Based on this information as well as business need, risk mitigations (i.e. climate related projects) are prioritized & completed in a manner that will allow Vermilion to support healthy communities as well as augment our strong shareholder value & return. This review for upstream risks considers the potential impact of a 1.5 to 2D scenario, with these impacts included in our risk assessment process, including:

- Carbon taxation by governments
- Carbon sequestration through our partners
- Emission reporting obligations by governments and regulators
- Product efficiency regulations & standards by governments and regulators
- Uncertainty surrounding new regulation, and
- Reputation

The results annually feed back into our risk/opportunity management process to ensure Vermilion has a sound data foundation to support responsible decisions in our operating areas. Detailed analysis of these risks, including potential impact, financial implications, management methods & cost of management, support our business strategy related to the energy transition.

The upstream value chain assessment benefits from the integrated Market analysis completed by our Marketing Team, which includes assessment of global fundamentals. This falls under the oversight of the BOD Audit and Sustainability Committees and is reviewed during committee meetings at least 3 times/year, and by the Board during its annual strategy session.

In 2019, we also expanded our scenario analysis process. The Board of Directors, executive team and senior management, including the managing directors of our business units, participated in a robust scenario analysis, examining two key scenarios from the World Economic Forum that bring together the work of significant contributors in this area, from the International Energy Agency to Carbon Tracker. These scenarios compare a Gradual and a Rapid transition to low carbon, with the latter meeting the aims of the Paris Agreement to limit global temperature increases to 1.5°C to 2 °C, with 1.5 °C preferred. This provided an opportunity to assess the key factors impacting the speed of the energy transition, including the influence of new energy technologies, the potential speed of adoption of these technologies, the anticipated changes in policy and

regulation surrounding the energy transition and their rate of change, and emerging market pathways such as India. The scenario analysis extended to the risks and opportunities related to these climate-related factors, the resulting impacts on the company's future not just in the short-term, but in the medium to long term (2050+), and strategies for Company resilience – overall and by business unit.

An example of the upstream risk that we consider is the availability and implementation of technology in our value chain upstream of our operations (i.e. by vendors providing services). This is a risk to our operation because the implementation of technology in our operations around the world ensures continued safe development and operation of our assets, which supports our commitments to HSE and Sustainability, as well as our Operational Excellence programs. Early engagement on the emergence and potential application of new technology in our programs, and ensuring outdated technology and practices are reduced by our vendors, is key to our ongoing operational excellence. This specifically includes working with vendors and suppliers to reduce the greenhouse gas emissions of the services they provide to us, and to take advantage of programs they offer, often via government and/or regulator emissions reduction programs, to help us replace outdated technology with better options that incorporate either greater energy efficiency or renewable energy, such as the installation of small solar panels on our Mannville production sites in Canada.

Upstream opportunities include those associated with business development. Part of our overall business strategy and risk management is to establish our operations in regions around the world that have robust regulatory approaches to energy exploration and production. At the same time, our risk identification and assessment processes have identified that governments and regulators are increasingly concerned about working with strong, reputable and climate-aware producers. One of our responses is to include information about our management of sustainability and climate issues in our business development documentation for bid/RFP/license applications.

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**Value chain stage(s) covered**

Downstream

**Risk management process**

Integrated into multi-disciplinary company-wide risk management process

**Frequency of assessment**

More than once a year

**Time horizon(s) covered**

Short-term

Medium-term

Long-term

**Description of process**

Vermilion includes assessment of downstream climate related risk within our integrated risk framework, described in the 'direct operations' text above. Our process covers climate-related risks and opportunities in our downstream value chain, including direct impacts for stakeholders such as purchasers & joint venture partners, and indirect impacts for stakeholders such as our communities, which benefit from our investment in local infrastructure, employment and non-profit/charitable organizations. Our response in this section of text deals specifically with the downstream risk category.

Overall, risk & opportunities are prioritized based on the materiality, probability & potential impact to our operations. Impact to the environment as well as financial implications of identified climate change risks & potential project opportunities are built into the ERM process, with every risk in our Risk Register being assessed for its potential impact on climate change. Based on this information as well as business need, risk mitigations (i.e. climate related projects) or business process or strategic adaptations are prioritized & completed in a manner that will allow Vermilion to support healthy communities as well as augment our strong shareholder value & return. This review for downstream risks considers the potential impact of a 1.5 to 2D scenario, with these impacts included in our risk assessment process, such as:

- Product efficiency regulations & standards
- Reputation
- Changing consumer behaviour
- Community climate risk concerns

The results annually feed back into our risk/opportunity management process to ensure Vermilion has a sound data foundation to support responsible decisions in our operating areas. Detailed analysis of these risks, including potential impact, financial implications, management methods & cost of management, support our business strategy related to the energy transition.

Specifically, this category is included in the integrated Market analysis completed by our Marketing Team, which includes assessment of global fundamentals. This type of risk falls under the oversight of the BOD Audit and Sustainability Committees and is reviewed during committee meetings 3 times/year. An example of downstream risk that is assessed is the impairment of a favourable market due to government regulation related to sources of energy.

Another example of downstream risk that we have identified, assessed and responded to is concern within our communities about the impact of oil and gas operations. We have responded in part through a focus on reducing our impact through operational excellence and HSE, through increased communication via our Public and Government Relations programs, and through our strategic community investment program, specifically by developing and launching our Global Environmental Stewardship Program. Through this program, the volunteer time and donations from our staff support non-profit and charitable organizations that are protecting the ecosystems and biodiversity that are important to the communities around our operational areas.

Because of the connection to our staff, this not only supports employee engagement, but also helps our communities see a visible example of our commitment in this area when we are out planting trees, for example.

## C2.2a

### (C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Vermilion is fully committed to operating responsibly in all of our jurisdictions, and as such meeting regulatory requirements and industry standards. This commitment makes both Current Regulation and Emerging Regulation material to our operations. On an ongoing basis in every BU our technical teams assess our current operations and planned development activities to ensure that we operate within our commitment to responsible operations. We also engage external regulatory experts to ensure that our staff is up to date on current regulation, as well as upcoming changes to regulations impacting our operation. In addition, the Public and Government Relations staff in our business units provide important monitoring of the interpretation of current regulations, which can be subject to change by the courts and government departments. This type of risk falls under the oversight of the Board as well as the HSE and newly created Sustainability Committees and is reviewed during committee meetings 3 times/year. An example of monitoring of current regulation in our Canadian operations that directly impacts climate change is our ongoing monitoring of Directive S-10 in Saskatchewan, which provides regulatory requirements for reducing flaring, incinerating and venting of associated gas. This regulation augments the commitment Vermilion made to reduce emissions associated with flaring and venting in our Saskatchewan assets following the acquisitions of infrastructure with a high emissions profile in 2014 (Elkhorn) and 2018 (Spartan). In April 2019, Vermilion's Canadian operations outside Alberta became subject to the federal Greenhouse Gas Pollution Pricing Act (GGPPA). Carbon tax rates under the GGPPA are set at \$20 per tonne of CO <sub>2</sub> e in 2019 and escalate to \$50 per tonne of CO <sub>2</sub> e by 2022. The economy wide carbon tax that took effect in Alberta in 2017 was repealed in May 2019 and as a result, the Canadian federal government announced in June 2019 that the fuel charge element of the GGPPA will apply in Alberta starting in 2020. In 2019, the Saskatchewan government introduced regulations that provides for financial penalties starting in 2020 for methane emissions in excess of defined limits. Taxation is considered an ongoing risk and has the potential to change as a result of political

		elections. Increases in carbon taxes would result in a decreased netback.
Emerging regulation	Relevant, always included	At Vermilion, responsible energy development and stewardship includes ongoing assessment of emerging regulations in all of our business units around the world. In addition to the responsibility of managers and project leads to understand and ensure our activities are planned and completed in a manner that ensures compliance, Vermilion has positions that have direct responsibility for the identification or emerging regulations that could impact the organization. This type of risk falls under the oversight of the Board, HSE and Sustainability Committees and is reviewed during committee meetings 3 times/year. An example of emerging regulation and their associated risks impacting our operations is the risk associated with the regulation of carbon emission pricing in the regions where we operate. This is assessed on an ongoing basis, with a formal review occurring at a minimum of twice a year. Our focus on Integrated Sustainability led Vermilion to develop our country specific Carbon Liability Management Tool. Updated annually, this tool provides business unit leadership and project managers with the information to assess the current and forecasted carbon liability associated with our activities, based on the current, and forecasted changes to carbon cost in the short and medium term. Another example of our management of climate-related risks is provided by the December 2017 approval by the French parliament of their proposed Climate Plan, which prohibits the issuance of new oil and gas exploration concessions and limiting the renewal of existing production concessions beyond 2040. Based on our ongoing review of this emerging legislation and its final details, we were able to conclude that we do not expect these new laws to have a material impact on our future production profile.
Technology	Relevant, always included	Vermilion is committed to being a best-in-class energy development organization and a leader in sustainability among our peers. On an ongoing basis our professional staff around the world assess how new and emerging technology can affect our business model but also support our initiatives to be a key player in the energy transition. This risk operates at several different levels: on a global basis, emerging technology in renewable energy generation, LNG production, the varying sources of hydrogen production, and the impact on electricity demand of the increasing availability of electric vehicles, have the potential to impact the demand for fossil fuels. Coal-focused companies were the first to feel this impact, but oil and gas companies are being impacted, particularly as national governments focus on renewables and other options, including emerging nuclear energy such as small-scale reactors for example, to decrease their reliance on fossil fuels. Since this is a quickly changing field, we are using scenario analysis to assess the potential impact on Vermilion of different speeds

		<p>at which the energy transition, and the technology at its foundation, might move.</p> <p>At a more granular level, technology has the potential to disrupt our competitive advantage as the number of options that can reduce emissions increases. Conversely, that technological advancements can help Vermilion optimize its operations and improve return to our shareholders.</p> <p>A relevant technology example that aligns the global risk with the risk at our sites, is our installation of small solar panels on our Mannville sites in Canada to harness renewable energy as a way to reduce our own emissions. Another is an ongoing program in Canada to install pump-off controllers at wellsites so that the pump operates only when enough fluid is present. Annually, this is expected to reduced power consumption by approximately 17 % resulting in an estimated 10,000 kWh saving per year per well. The current risk at the asset level is the increasing pace of available technology, its cost, the resources available to assess and install it, and the cost vs benefits of using it when compared to our peers.</p> <p>This type of risk falls under the oversight of the Board and newly created Sustainability Committee and is reviewed during committee meetings 3 times/year.</p>
Legal	Relevant, always included	<p>We are committed to responsible energy development throughout the lifecycle of our operations. This includes, at a minimum, operating in compliance with all applicable regulations that govern our activities. However, our risk assessment has shown that regulatory compliance – and the anticipation of regulatory changes with proactive changes – may not be fully protective against the risk of legal challenges (a) against Vermilion directly, or (b) against other entities such as our regulators, with resulting effects on our operations. These risks are monitored by our corporate Sustainability team for legal risks with global scope, such as climate change liability suits launched by environmental non-governmental organization and various levels of government, and such as cities and states, against the supermajors. These take several forms, including addressing liability for climate change caused by fossil fuels, and resulting damages, on behalf of specific groups. They also include attempts to establish fraud, such as New York state’s lawsuit against Exxon Mobil that focused on how the company had accounted for and reported the costs of climate change, including regulation. On a business unit level, staff including managing directors, permitting specialists and public and government relations staff monitor the potential for legal action either directly against the company or against a regulator to be taken to curtail production, stop or</p>



		<p>delay exploration, or otherwise contest permit and license applications. Examples of this have occurred in several of our regions, including in the US, where advocacy groups went to court to contest the Bureau of Land Management’s granting of oil and gas leases in Wyoming; in this case, the court ordered the BLM to reassess its environmental analysis to include a wider analysis of potential climate impacts. This type of action can create permitting delays for our exploration and production activities while the court process is followed.</p> <p>This type of risk falls under the oversight of the Board and newly created Sustainability Committee and is reviewed during committee meetings 3 times/year.</p>
Market	Relevant, always included	<p>Consistent with its strategic objectives of achieving best-in-class HSE and operational excellence, Vermilion focuses on understanding and assessing market risks related to climate. To achieve this, the Marketing Team is continually analyzing and assessing various internal and external climate risk factors that could impact Vermilion directly, or the markets in which Vermilion operates. From internal policies that ensure Vermilion operates at a best-in-class standard, to holding vendors and contractors to the same high standards as Vermilion, to monitoring external factors such as developments in climate-related government policies, Vermilion is committed to a proactive approach to assessing its market risks stemming from Climate. A key part of Vermilion’s commitment is ensuring we are operating at or above the regulated standards for the jurisdictions we operate in. The Marketing Team works closely with internal and external stakeholders to ensure we are aware and on top of developments or changes to climate-related regulations. This type of risk falls under the oversight of the Board, Audit and Sustainability Committees and is reviewed during committee meetings 3 times/year. An example of risk identified by our Marketing group is the 2020 IMO fuel Sulphur regulation that will become effective Jan 1 2020. The IMO Marpol Annex VI regulation will limit the sulphur content of bunker fuel to a maximum of 0.5%. At present, the global sulphur content cap on bunker fuel is at 3.5%. This new IMO regulation will not restrict Vermilion’s sales of oil in France or Australia but will result in higher transportation costs, which will negatively impact the netback for France but could result in an increase of \$1/bbl transportation costs, for Australia and 45% of France production.</p> <p>It is important to note that in some cases, this change in IMO regulation will affect pricing received for our production.</p>
Reputation	Relevant, always included	<p>One of the dedicated risk categories within Vermilion’s Corporate Risk Register is Strategic &amp; Reputational risk, which is a material risk given Vermilion’s successful global portfolio of assets. Vermilion’s risk</p>

		<p>assessment framework is integrated in that each risk is assessed for potential implications to different parts of the organization, with the largest material risk determining the risk category. The separate divisions within our Risk Register are intended to focus our risk assessment teams to ensure that they examine our organizational risks against this category. This type of risk falls under the oversight of the Board, HSE and Sustainability Committees and is reviewed during committee meetings 3 times/year. An example of a climate related reputational risk that impacts our business on an ongoing basis is our social license to operate in all of our jurisdictions. As we, as a society, move toward less carbon intense fuels, how energy companies produce their products will become increasingly important. This was one of the guiding factors in Vermilion updating our organizational structure and making Integrated Sustainability one of our strategic objectives.</p>
Acute physical	Relevant, always included	<p>Climate related physical risks to our people, the environment and our assets is an ever present risk that is assessed on an ongoing basis. Typically this exposure is associated with the frequency and severity of extreme weather events. Vermilion has detailed Corporate and operation specific emergency response plans developed and implemented to assist in managing risks and impacts from acute physical climate related risk. Our leadership and technical teams factor this risk into the planning portions of all projects completed annually. The frequency of this risk assessment is dependent on each specific risk case. This type of risk falls under the oversight of the Board, HSE and Sustainability Committees and is reviewed during committee meetings 3 times/year. For example, Vermilion Australia operates the Wandoo oil field on the North West Shelf (NWS) of Western Australia. Annually, we are exposed to acute physical risk to our infrastructure associated with cyclone season. During cyclone season, our monitoring of conditions is continuous to support our ability to react and respond to a potential impact to our operation.</p>
Chronic physical	Relevant, always included	<p>While many of the impacts related to climate change are acute in nature (as described above), Vermilion has identified a number of risk scenarios that have the potential to impact our operations related to chronic changes in the regions which we operate. These risks include changes to temperature extremes (hot and cold) affecting our ability to develop resources as planned, changes in precipitation resulting in regional redistribution of the resources in the hydrologic cycle impacting our ability to utilize water for our operations, and rising sea levels impacting our costal operations and the communities in which we live and work. Vermilion has experts in each of our Business Units who continually assess the options to develop our resource portfolios and where we can implement new technology to address challenges associated with chronic changes to the environment. This type of risk</p>

		falls under the oversight of the Board, HSE and Sustainability committees and is reviewed during committee meetings 3 times/year.
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## C2.3

**(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes

### C2.3a

**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

#### Identifier

Risk 1

#### Where in the value chain does the risk driver occur?

Direct operations

#### Risk type & Primary climate-related risk driver

Emerging regulation  
Carbon pricing mechanisms

#### Primary potential financial impact

Increased direct costs

#### Company-specific description

As a responsible energy producer playing a key role in the energy transition, we have identified this risk as strategic because of its links to current and future regulations, both of which will impact our ability to not only operate in our areas but also to grow.

Vermilion first undertook a comprehensive Global Carbon Liability assessment in 2011 and overhauled or process in 2017 with the development of our Carbon Liability Assessment Tool, which covers short and medium-term assessment of carbon liability risk. The tool has been rolled out to our operations and the policy framework is reviewed and updated annually.

We have identified potential and planned regulatory changes that would affect our operating units by the way of a carbon taxation shift. In April 2019, Vermilion's Canadian operations in Saskatchewan and Manitoba became subject to the federal Greenhouse Gas Pollution Pricing Act (GGPPA). Carbon tax rates under the GGPPA were set at \$20 per tonne of CO<sub>2</sub>e in 2019 and escalate to \$50 per tonne in 2022. The economy wide carbon tax that took effect in Alberta in 2017 was repealed in 2019 and, as a result, the fuel charge element of the GGPPA will also apply Alberta starting January 2020. In December 2019, the Canadian government announced that Alberta's newly created

TIER regulation met the federal stringency requirements and, as such, the federal output-based pricing system (OBPS) would not apply in Alberta. Similar to the federal OBPS, the Alberta TIER system will apply a tax rate of \$30 per tonne of CO<sub>2</sub>e commencing January 2020.

Our European operations fall under the European Union Emissions Trading Scheme, however, due to the size of our facilities we generally do not meet the reporting threshold. Our Ireland operations are subject to the EU ETS. Our operations in Australia fall under the National Greenhouse and Energy Reporting Act (2007). No carbon tax applies to Australian production at this time.

We note that carbon pricing mechanisms are vulnerable to changes in government policy and so regions with upcoming elections, coalition governments or minority governments may be subject to changes that cannot yet be identified in a quantifiable way. Additionally, it is too early to identify the impact of COVID-19 on carbon pricing mechanisms but we note the political focus in the EU and Canada on an economic recovery that is both climate-focused and responsive to social justice issues such as labour practices.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

1,850,000

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

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

**Explanation of financial impact figure**

The financial impact is based on outlay associated with the various taxation schemes in our global operating areas in the medium term on an annual basis. This does not account for Vermilion's proactive programs to manage emissions. Our Canadian operations are currently subject to the federal GGPPA, Saskatchewan OBPS and Alberta TIER carbon tax programs and related emissions reduction requirements. Our Ireland operations are subject to the EU ETS and Ireland Carbon Tax systems, with costs associated with the former expected to increase substantially in 2021 as the free allowances start to phase-out. Our Canadian carbon tax liability is not expected to

exceed \$0.5MM/year in the medium term. The Ireland EU ETS liability is forecasted to be approximately \$1.1MM/year between 2021 and 2025. The Ireland Carbon Tax liability is forecasted to be an additional approximately \$0.25MM/year over this period.

Commencing in 2021, it is anticipated that our Netherlands operations will also be subject to an indirect carbon tax applied to the price of fossil fuels. Details regarding the tax are still evolving; however, at this time the cost implication of the tax is expected to be limited in relation to our operations and related purchases.

### **Cost of response to risk**

160,000

### **Description of response and explanation of cost calculation**

Vermilion continues to monitor and comply with the taxation requirements and where appropriate, Vermilion will engage subject matter experts in this area. In addition, Vermilion has experts in the fields of engineering, asset integrity, optimization, health safety & environment, and sustainability that assess our operations to determine where we are able to apply the principles of Operational Excellence supporting Integrated Sustainability. As a result, the potential financial impact is significantly decreased (<\$300,000 per month) and anticipated to decrease further in the short term. No additional risk mitigative measures are deemed necessary. Vermilion's ongoing efforts to reduce the energy intensity of our operations also contribute to managing this risk. An example of this is the significant reduction of the energy intensity of our Netherland operation under the MJA3 program. In our Canadian operations, multiple emission reduction projects have been identified, planned and implemented resulting in significant reductions of emissions reducing Vermilion's exposure to future potential changes to carbon taxation.

The cost of managing this risk is built into Vermilion's operating costs. It is estimated that the cost of monitoring taxation regime changes and managing risks in all of our operating areas specific to carbon tax to be \$160,000 per annum. We anticipate the effort in monitoring and managing this risk to increase moderately in the medium-term. This estimate does not include the cost of the many emission reduction initiatives that Vermilion has detailed in this report. The estimated cost is based on 0.1 FTE employee per business unit per annum ( $8 \times 0.1 \times \$200k = \$160k$ ).

### **Comment**

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#### **Identifier**

Risk 2

#### **Where in the value chain does the risk driver occur?**

Direct operations

#### **Risk type & Primary climate-related risk driver**

Emerging regulation  
Enhanced emissions-reporting obligations

### **Primary potential financial impact**

Increased direct costs

### **Company-specific description**

As a responsible energy producer playing a key role in the energy transition, we have identified this risk as strategic because of its links to current and future regulations, both of which will impact our ability to not only operate in our areas, but also to grow.

Regulatory reporting obligations are considered an ongoing short-term risk. Vermilion's operations in Alberta fall under both provincial and federal jurisdiction in relation to emissions. The Carbon Competitiveness Incentive Regulation (CCIR) and Specified Gas Reporting Regulation (SGRR) in Alberta apply to facilities emitting more than 100,000 and 10,000 tonnes of CO<sub>2</sub>e per annum, respectively. The federal Green House Gas Reporting Program (GHGRP) requires facilities emitting more than 10,000 tonnes of CO<sub>2</sub>e per annum to report.

Vermilion operates facilities that emit more than the provincial and federal reporting thresholds in Canada and the quantification and reporting of these emissions is managed under our GHG quantification program. Based on the application of technological improvements to our quantification and tracking programs, the current forecasts indicate that the risk associated with Vermilion's Alberta operations is low. Vermilion actively reports our operations energy efficiency and GHG intensity in our Netherlands and France operations, and are below the EU ETS threshold of 20MW thermal rated input. Our Ireland operations are subject to the EU ETS and Ireland Carbon tax schemes. Our United States operations comply with the EPA requirements related to stationary engines and hold permits to operate which includes emissions testing, inspections and triennial reporting requirements across our operation. Vermilion's Australia operations report emissions as per the National Greenhouse and Energy Reporting Act, which requires robust emissions accounting.

Emissions reporting obligations are considered a dynamic risk and have the potential to change with government elections as well as regulatory evolution in our operating areas. As a responsible energy producer and corporate citizen, we seek to proactively comply with or exceed government regulations, so it is important to us to actively mitigate this risk. In addition to reporting obligations governed by regulations, we also consider external stakeholder input related to voluntary disclosure of information, such as recommendations for climate reporting from the TCFD and SASB, which investors are increasingly adopting.

### **Time horizon**

Short-term

### **Likelihood**

About as likely as not

**Magnitude of impact**

Low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

350,000

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

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

**Explanation of financial impact figure**

Based on the current output of Vermilion's facilities in Canada and Europe and , based on the current regulated thresholds factored against project growth, Vermilion anticipates the cost associated with meeting emission reporting obligations in these countries to increase in the short-term. The financial impact is anticipated to be realized as a small increase in operational cost associated with the management and quantification of emissions to meet new reporting requirements. Regulations in all of our BUs are monitored on an ongoing basis, and assumptions/scenario planning is utilized to assess risk. These assumptions are reviewed on an annual basis. The cost to do the above is built into Vermilion's operating expenses and is currently estimated at \$350,000 annually. The estimate assumes \$50k per business unit per annum (excluding CEE) built into the OPEX budget ( $\$50k \times 7 \text{ BUs} = \$350k$ ).

**Cost of response to risk**

50,000

**Description of response and explanation of cost calculation**

Vermilion monitors as well as engages stakeholders relating to Emissions Reporting Obligations. Management of this risk is built into Vermilion's operations and our Enterprise Risk Matrix. Vermilion's Corporate Risk Matrix is utilized to assess operational, environmental (including climate change), regulatory compliance, credit, market, financial, organizational, political, strategic and reputational, and sustainability risk. Risk is assessed based on the anticipated probability of an event compared to the financial and reputational impact to Vermilion. An example of the proactive steps Vermilion is taking to manage this risk is the development of our robust emissions quantification programs globally, supporting increased access to information and reporting effectiveness.

The direct cost of Vermilion's operating excellence and risk management cannot be quantified on a single risk basis. The direct cost associated with the proactive development, implementation and improvement of Vermilion's corporate emissions reporting framework is estimated to be \$0.25MM per annum. It is estimated that specific to this risk, the financial implications annually in our development and implementation of



emission reporting improvements is \$50,000. The estimate assumes an 0.25 FTE employee per annum across all BU's (0.25 x 200k = \$50k).

## Comment

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### Identifier

Risk 3

### Where in the value chain does the risk driver occur?

Direct operations

### Risk type & Primary climate-related risk driver

Emerging regulation

Mandates on and regulation of existing products and services

### Primary potential financial impact

Increased direct costs

### Company-specific description

As a responsible energy producer playing a key role in the energy transition, we have identified this risk as strategic because of its links to current and future regulations, both of which will impact our ability to not only operate in our areas, but also to grow.

Vermilion's operations are subject to regional regulatory changes that result in changes to equipment requirements to reduce carbon emissions and/or emissions of criteria air contaminants. Several examples of changes associated with product efficiency are present, such as the recent Methane Reduction Retrofit Compliance Plan and update to Directive 039 (benzene emissions from glycol dehydrators) in Alberta, Canada, and France's adoption of the agreement to end routine flaring by 2030. These regulatory changes, which in varying stages of either development or implementation, led Vermilion to complete engineering reviews and facility updates resulting in emission reductions beyond regulatory requirements. Projects are being identified on an ongoing basis that will result in increased operational efficiency and a reduction in methane and VOC's once implemented. This risk relates specifically to the potential financial implications associated with engineering and equipment modifications that are/may be required to address specific air emission types, which have an impact on overall GHG emissions for an operating area. These pollutants can vary depending on location. Vermilion has also participated in the MJA3 program in our Netherlands business unit since 2005. This has resulted in project and initiatives that have reduced our operations energy intensity by 75.7%.

### Time horizon

Short-term

### Likelihood

Virtually certain

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

2,000,000

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

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

**Explanation of financial impact figure**

Based on near-term scoping estimates, the operational changes to comply with the regulations associated with the reduction of methane from our assets is expected to be approximately 1.5MM in the short term. The costs associated with the engineering and infrastructure changes to eliminate routine flaring in our France operations is not expecting to exceed 0.5MM. The costs associated with the MJA3 program in the Netherlands are built into our operating costs and no significant expenditures are anticipated in the near term.

**Cost of response to risk**

100,000

**Description of response and explanation of cost calculation**

Vermilion is allocating resources to complete these works on a planned program basis, as opposed to a reactive single replacement program, resulting in an overall reduction in costs associated with the work. Tying in vented equipment to flaring infrastructure in Canada is an example of projects planned in the near term to address this risk.

The implications of additional project planning and coordination is anticipated to be minimal, and will be included with regular works to increase operational efficiency at the subject locations. The cost of managing the risk is estimated to be \$100,000 per annum. The estimated cost is based on a single 0.5 FTE employee across both business units (\$0.5 x \$200k = \$100k).

**Comment**

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**Identifier**

Risk 4

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Emerging regulation  
Other, please specify  
Policy and Legal

**Primary potential financial impact**

Increased direct costs

**Company-specific description**

As a responsible energy producer playing a key role in the energy transition, we have identified this risk as strategic because of its links to current and future taxation and regulations, all of which will impact our ability to not only operate in our areas, but also to grow.

Due to the international scope of Vermilion's operations, the risk associated with a change in emission regulations in one or more of our business units in the near term is greater than a single geographically bounded asset base organization. These risks are accounted for by Vermilion's Enterprise Risk Matrix and mitigation measures are reviewed, updated and implemented on an annual basis, as required. In addition to direct impact from a shift in regional emissions regulation, a shift in international regulations may result in an impact to Vermilion's supply chain, resulting in a limitation of market access or direct impact to the price of our products. As Vermilion maintains a diversified asset base, we believe the risk to the marketability of our products is low.

**Time horizon**

Medium-term

**Likelihood**

More likely than not

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

2,000,000

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

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

**Explanation of financial impact figure**

Following the COP21 conference, the importance of sustainable development and reduction of emission levels was solidified by the commitments made by international governments. Based on the anticipated changes in the various regulatory regimes under

which Vermilion operates, the financial impact due to a regulatory change over the next 3 years is anticipated to be less than \$2.0MM. This amount does not include the cost associated with emission reduction projects completed on an annual basis, or previous projects that have annual emissions reductions. This is a high-level compliance estimate of less than \$100k per BU per year (excluding CEE), including employee time and project expenditures, over a three year period (7 x \$100k x 3 ~ \$2MM).

### **Cost of response to risk**

275,000

### **Description of response and explanation of cost calculation**

In alignment with our strategic objectives and the SDG's, Vermilion began adding additional resources to support Integrated Sustainability in 2017. The formalization of Integrated Sustainability as a strategic objective was further supported by the establishment of a Sustainability Committee within our Board of Directors, and a senior leadership Sustainability Steering Committee in 2018. These committees provide additional governance, focus and greater sharing capability for all business units on this matter. These changes allow Vermilion to better understand, identify, proactively respond and manage the potential risk and uncertainty inherent in an evolving sustainability framework, both at a regional and corporate level. An example of our management method includes our assessment of regulatory regime changes in our Enterprise Risk Matrix assessment completed on an annual basis. Another example, commencing in 2017 Vermilion added requirements to assess all capital expenditures and all Risk Register cases for potential sustainability related impacts. Based on our assets, increased operational cost can be absorbed by Vermilion's operations around the world. With regard to international policy development, Vermilion actively works with organizations in all areas where we operate to lead/discuss resource policy development and potential changes that could impact our operations.

The direct cost of Vermilion's operating excellence and risk management cannot be quantified on a single risk basis. The cost estimate assumes a single FTE employee across all BUs (\$200k). The direct cost associated with Board and Senior Management consideration and direction, operational monitoring and responding to the changing landscape of sustainability and emissions on an annual basis is estimated at \$0.5MM with an additional \$0.25MM being associated with annual changes to manage this risk.

### **Comment**

---

#### **Identifier**

Risk 5

#### **Where in the value chain does the risk driver occur?**

Direct operations

#### **Risk type & Primary climate-related risk driver**

Chronic physical  
Rising mean temperatures

**Primary potential financial impact**

Increased direct costs

**Company-specific description**

Based on Vermilion's assets across the globe, a decrease or increase in the temperature extremes experienced in the winter/summer months (i.e. lower seasonal lows, higher seasonal highs) could result in an increase in the amount of fuel gas utilized by a variety of equipment essential for safe production of the resource. Additional equipment could also be required (e.g. building heaters, line heaters) to ensure safe and efficient operation. This would impact our operations by requiring additional resources (infrastructure) as well as increase our carbon footprint as a result of more energy being utilized for heating/cooling our operations and potential impact from the price of carbon. Temperature extremes also have the potential to increase capital costs associated with drilling, completion and workover operations as a result of increased timelines, decreased productivity, equipment breakdown, etc. Temperature extremes on the high and low end of the scale would result in the increase of costs to produce our products on an annual basis. For example, an overall increase in seasonal lows (warmer winters) would have a direct impact on Vermilion's more northern onshore operations and could result in a decrease in ability to access lands and increase construction capital requirements.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

500,000

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

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

**Explanation of financial impact figure**

The financial implications on an annual basis are difficult to quantify, however based on Vermilion's experience, the most significant financial implications would result from shutdowns experienced drilling or completions locations. The estimated implications of

this would be \$0.5MM per day of delay following mobilization. In the event of decreased frost days, Vermilion would be forced to examine other technologies to allow for access to remote areas, including freezing roads utilizing liquid nitrogen, utilizing low ground pressure equipment or altering construction methods and timing.

**Cost of response to risk**

100,000

**Description of response and explanation of cost calculation**

Vermilion has integrated technical teams in each business unit responsible for project management and advancing Vermilion Operational Excellence. These teams also act as technical experts across the organization to strengthen our development programs. As extreme weather cannot be controlled, Vermilion utilizes our various Management Systems and processes to protect the health and safety of our workers, contractors and the public, and protect the environment from adverse effect. Vermilion will not jeopardize HSE in favor of productivity. An example of how Vermilion has adjusted our business practices to minimize the potential impact related to access in remote assets, Vermilion utilizes multi-well pads with multiple horizontal wells drilled from a single location. This reduces the aerial impact of these activities on the environment in the area and allows for the minimization of habitat fragmentation as well as carbon emissions associated with lease construction and equipment mobilization/demobilization. Utilizing multi-well locations would significantly decrease capital considerations in the event that limited frost days were realized in the coming years.

Health, Safety and Environmental management is built into Vermilion's business and core values. The cost of mitigation measures and project management that effectively reduce the financial impact to Vermilion if an event were to occur is estimated to be \$0.1MM per annum. The estimate assumes a single 0.5 FTE time across all BUs is spent managing this situation annually (0.5 x \$200k = \$100k).

**Comment**

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**Identifier**

Risk 6

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Chronic physical

Changes in precipitation patterns and extreme variability in weather patterns

**Primary potential financial impact**

Increased direct costs

**Company-specific description**

Vermilion holds assets inland, in coastal regions, and offshore. A change in the precipitation experienced in any of these locations (Increase or decrease) could have a negative impact on operations as a result of drought or flooding. Flooding of operating areas could result in limited access to locations/facilities resulting in an impact to production. Flooding also poses a risk to Vermilion's corporate headquarters, located in Calgary, Alberta. Alternatively, drought conditions could impact the availability of surface and/or groundwater, which Vermilion, in part, relies on for drilling and completion activities. A limit in the access to this resource could negatively impact the forecasted growth by increasing the timelines and capital costs associated with bringing new infrastructure onto production. Although we have programs in place to reduce fresh water (surface and groundwater), Vermilion has elected to eliminate water diversion and/or shut-in production as a result of prolonged periods of low precipitation. One such instance was the Slave Lake, Alberta wildfires which resulted in Vermilion shutting in production of the entire field to protect the health and safety of our workers, and protect the environment from potential adverse effect (I.e. environmental releases).

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

11,500,000

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

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

**Explanation of financial impact figure**

The financial implications of a single time event (i.e. wild fire in Cazaux oil field affecting production of Cazaux and Lege fields, France) has been assessed on a case-specific basis, and the financial implications of this event is believed to be substantive (impact > \$10MM). The estimated costs associated with this event include repair of electrical distribution system owned by Vermilion (\$5.2MM) and business interruption due to Cazaux and Lege field production shutdown of 2500 bbls/d at a netback of \$42/bbl for 60 days (\$6.3MM). Vermilion maintains insurance to mitigate the potential impact of precipitation-related extreme events (i.e. Wildfire, Flooding).

**Cost of response to risk**

950,000



### **Description of response and explanation of cost calculation**

As these incidents are out of Vermilion's control, we take all measures possible to ensure effective emergency response to extreme weather events, to ensure the protection of the health and safety of our workers, contractors and the public, the protection of the environment and limiting the financial impact of the event. In the case of a longer term extreme precipitation event or drought, in the past Vermilion has implemented water management programs to reduce our reliance on fresh water sources to limit the potential impact on operations.

Insurance for locations that have been identified as potentially being impacted by drought induced events (e.g. Forest fire) is estimated at \$0.45MM per annum. In addition to insurance, Vermilion invests over \$0.5MM in emergency response drills and training on an annual basis.

### **Comment**

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#### **Identifier**

Risk 7

#### **Where in the value chain does the risk driver occur?**

Direct operations

#### **Risk type & Primary climate-related risk driver**

Chronic physical  
Rising sea levels

#### **Primary potential financial impact**

Decreased revenues due to reduced production capacity

#### **Company-specific description**

Vermilion owns and operates assets in the Netherlands. Based on the location of our assets, Vermilion has identified and assessed the potential risk associated with rising sea levels, as it has the potential to physically impact our operations in this region. Rising sea levels also pose a threat related to the salinization of the groundwater regime.

#### **Time horizon**

Long-term

#### **Likelihood**

Exceptionally unlikely

#### **Magnitude of impact**

Medium-high

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

91,300,000

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

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

**Explanation of financial impact figure**

Vermilion reviews the potential impact of sea level rising on an annual basis as part of our Enterprise Risk Management process. It has been estimated that a rise in sea level could have a maximum foreseeable financial impact of \$91.3MM at our main gas processing facility Garijp (GTC) in the Netherlands, caused by an extreme tide/extreme wind event 1 in 10000 years. The Garijp plant processes 6500 boe/d net to Vermilion. This cost estimate includes repair of physical damage to the plant (\$21 MM), business interruption due to Garijp gas field production shutdown of 6500 boe/d at a netback of \$33/boe for 250 days (\$53.6MM), environmental clean-up (\$8.5MM) and third party liability(\$8.2MM). These costs are before any potential insurance recovery.

**Cost of response to risk**

350,000

**Description of response and explanation of cost calculation**

Other than conventional berm protection, there is no measure available to protect Vermilion's assets in the Netherlands in the event that water levels rise to a level resulting in one of our main facilities being temporarily invaded by sea water. Based on Vermilion's assessment of the probability of these events occurring over the next 5 years being less than 0.05%, Vermilion has accepted this level of risk exposure.

Vermilion currently includes a review of this risk in our annual risk management process. The cost of insurance coverage associated with this risk is estimated at \$0.35MM per annum.

**Comment**

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**Identifier**

Risk 8

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Acute physical

Increased severity and frequency of extreme weather events such as cyclones and floods

**Primary potential financial impact**

Increased capital expenditures

**Company-specific description**

Vermilion owns and operates an offshore platform in the Wandoo field off the northwestern shore of Australia. Vermilion also owns a 20% working interest in and operates the Corrib project off the Irish coast as well as an unmanned production platform in the Wadden Sea in the Netherlands. It also owns and operates oil fields located in the coastal area of southwestern France. Extreme weather events such as cyclones have the potential to directly impact our offshore operations resulting in down time or damage to infrastructure. In addition to the direct potential physical impact to Vermilion associated with tropical cyclones, severe storms have the potential to impact the downstream handling capacity of our partners, resulting in a limitation to the distribution and sale of our products. Vermilion has experienced direct impact from storms in our Australia and France operations, including production downtime and equipment/facility damage. An increase in these events could have a direct impact on the production of products in these regions.

**Time horizon**

Medium-term

**Likelihood**

Exceptionally unlikely

**Magnitude of impact**

High

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

234,510,000

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

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

**Explanation of financial impact figure**

Based on the value of Vermilion's asset (the Wandoo B Platform), the financial implications associated with extreme damage and extended business interruption due to a severe damaging weather event is estimated at \$234.5MM (total impact before insurance) based on a 1 in 10000 year cyclonic event. This cost estimate includes extensive repair to the Wandoo platform (\$129.36MM), business interruption due to Wandoo oil field production shutdown of 4500 bbl/d at a netback of \$64/bbl for 365 days

(\$105.15MM). Third party costs associated with potential damages as a result of extreme weather events are not tracked by Vermilion.

**Cost of response to risk**

2,500,000

**Description of response and explanation of cost calculation**

Vermilion maintains insurance as a mitigative measure to reduce the financial impact associated with damages to our assets due to severe weather events. Vermilion has protocols for monitoring and preparing for cyclones, including forecasts every 12 hours that contain 24-hour and 7-day weather outlooks (this frequency changes to every 3 hours in the event of a cyclone, including its forecast and trajectory). We have also invested in our emergency response capabilities in the event of damage to our assets as a result of a cyclone or severe weather event. Operational changes are made as required to ensure (in order of priority) worker health and safety, protection of the environment, and protection of Vermilion assets. Vermilion has a robust asset integrity program that maintains its offshore facilities to its original design specifications of CAT 5 hurricane force.

The approximate cost of mitigation (insurance) measures put in place with regard to damaging weather event on an annual basis are approximately \$2.5MM.

**Comment**

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**Identifier**

Risk 9

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Market

Changing customer behavior

**Primary potential financial impact**

Decreased revenues due to reduced demand for products and services

**Company-specific description**

As consumers and governments become more socially aware of the sources of their energy, negative perception of an organization or the way that products are produced has the potential to seriously impact organizations. We are deeply embedded in the low-carbon transition that is unfolding globally, and we are doing so with an unwavering commitment to our priorities of health and safety, environmental protection, and economic prosperity. Vermilion believes that those commitments and our responsibility to the application of the UN SDGs is one of the qualitative advantages that set Vermilion apart from our competitors. In addition to implementing technologies to increase safety

and operational efficiency, and to reduce emissions in the field (i.e. reduced cycle chemical pumps, solar powered gauging equipment, LED Lighting, etc.), Vermilion invested additional resources during the construction of our corporate headquarters to build to the LEED GOLD standard. Sustainable practices are ingrained into the way Vermilion operates and we will continue to provide focus to our Integrated Sustainability business pillar. We believe this advantage will continue to give Vermilion a competitive advantage in the future.

**Time horizon**

Long-term

**Likelihood**

Very unlikely

**Magnitude of impact**

High

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

156,290,000

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

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

**Explanation of financial impact figure**

With an increase in consumer social conscience, a negative perception could impact Vermilion's ability to market our products in a competitive manner and could have a negative impact on the company valuation. The impact of decreased consumer confidence and perception is not calculable. On a per share basis, the market impact of the loss of \$1 per share would be approximately \$156.3MM.

**Cost of response to risk**

350,000

**Description of response and explanation of cost calculation**

Vermilion has implemented and continues to explore ways to decrease the footprint of our activities and support the communities in which we operate. Vermilion continues to make meaningful progress towards class leading emission reductions and emission intensity supporting our strategic objective of Integrated Sustainability, which we added as a strategic objective in 2015, completing staffing and organizational changes to further support this pillar in 2018. This included the establishment of a Board Sustainability Committee in 2018 and the addition of sustainability as a standalone meeting and program for the Executive Committee in 2020.

The formalization of Integrated Sustainability provides additional focus and greater sharing capability for all business units on this matter. These changes allow Vermilion to better understand, identify, proactively respond and manage the potential risk and uncertainty inherent in an evolving sustainability framework, both at a regional and corporate level. Vermilion is committed to playing a role in the energy transition, and is committed to sustainability, including the UN SDGs, and ensuring that the impacts from our operations are mitigated. Our focus on Sustainability leadership supports our effective management of this risk.

This document details the costs associated with the activities Vermilion has undertaken and the initiatives Vermilion is exploring. The direct cost of Vermilion's operating excellence and risk management cannot be quantified on a single risk basis. The direct cost associated with monitoring and responding to the changing landscape of sustainability and emissions on an annual basis is estimated at \$0.35MM. The estimate is based on a 0.25 FTE per business unit per annum (excluding CEE) ( $7 \times 0.25 \times \$200k = \$350k$ ).

#### Comment

## C2.4

**(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.4a

**(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.**

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#### Identifier

Opp1

#### Where in the value chain does the opportunity occur?

Direct operations

#### Opportunity type

Energy source

#### Primary climate-related opportunity driver

Participation in carbon market

#### Primary potential financial impact

Returns on investment in low-emission technology

#### Company-specific description

Vermilion is playing a meaningful role in the energy transition that is unfolding globally, and we are doing so with an unwavering commitment to our priorities of health and safety, environmental protection, and economic prosperity. A potential strategic opportunity that has been identified is our role in the European Union Emissions Trading Scheme, which allows for the generation and movement of certified carbon credits from emissions-saving projects around the world. Under the revised EU ETS Directive in effect 2021-2030, it is anticipated that there will be an active market and consumers for the offset credits generated at some of Vermilion's sustainability initiatives around the world. This upcoming shift in the cap and trade scheme will likely provide opportunities for Vermilion to generate certified energy reduction/offset credits through our geothermal cogeneration projects in France. We are actively monitoring similar carbon credit regime development in our operating areas and researching the use of similar projects in other business units, for revenue generation potential in addition to carbon credit options.

We anticipate that the EU ETS may be updated beyond its current planned rollout for 2021-2030, or that additional regulations may be brought into force, due to the economic and social impacts of COVID-19, as many in the EU are calling for a new green deal to include provisions for an economic recovery that includes provisions for addressing climate and social justice issues. Again, this may present a carbon market opportunity.

**Time horizon**

Medium-term

**Likelihood**

Very likely

**Magnitude of impact**

Low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

500,000

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

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

**Explanation of financial impact figure**

Vermilion is not accounting for any short term financial impact. It is estimated that following the change to the EU ETS in Phase 4, the carbon price will stabilize at approximately €30 per tCO<sub>2</sub>e. The financial impact to Vermilion annually is estimated to be up to \$0.5MM.

**Cost to realize opportunity**



50,000

### **Strategy to realize opportunity and explanation of cost calculation**

We are currently evaluating the benefit that certified offset credits from various emission reduction projects across our operations could provide Vermilion with the ability to generate certified reduction credits that could be transferred through the EU ETS. Examples of projects that have the potential to generate credits is our Tomato Greenhouse and eco-neighbourhood geothermal coproduction projects in France. Vermilion's project assessment framework is applied to each identified opportunity, including considerations associated with emissions offset credits based on the results of our case-specific business plans. Vermilion continues to monitor potential carbon markets and regulatory changes on an annual basis. This information is being utilized to support our ongoing evaluations of offset credit generation.

Vermilion's expenditure related to tracking this opportunity is built into the operations of our various business units and is currently minimal and is estimated at \$50,000 per annum.

### **Comment**

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#### **Identifier**

Opp2

#### **Where in the value chain does the opportunity occur?**

Direct operations

#### **Opportunity type**

Products and services

#### **Primary climate-related opportunity driver**

Development of new products or services through R&D and innovation

#### **Primary potential financial impact**

Other, please specify

Increased revenue through new solutions to adaptation needs (e.g. insurance risk transfer products and services)

#### **Company-specific description**

As Vermilion has developed our emissions quantification programs across the globe, we have developed more robust methods for sharing of technologies & techniques from across our operations, both internally & externally. Our increased focus on tracking our emissions has supported the assessment of opportunities across BUs & the sharing of technical expertise to support them. This supports our strategic objectives, including Integrated Sustainability. An example of the development of low emission goods/services is our France-based industry partnership with Avenia to expand the use of geothermal energy production in oil production, & a geothermal association in

Germany. Also in France, we are providing heat from the produced water in our oil operations to develop sustainable agriculture & residential projects. Our first energy-recycling sustainability project, launched more than 10 years ago, jump-started a new tomato industry in a region underserved by capital investment. Our similar geothermal community-building projects – one complete & one in the building process – specifically target economic inclusivity in the form of social housing: 30% of residences in the first project, & all residences in the new one, are reserved for those with lower incomes. In the Netherlands and France, we are continuing to research the potential to convert depleted gas wells to geothermal assets, which could supply energy to community and economic assets such as eco-neighbourhoods and agriculture centres, and to use our land base for partnerships with renewable energy suppliers. We are also assessing opportunities to build circular economy concepts more deeply into our operations, similar to how we are using waste heat from produced water to create geothermal applications. All of this reflects our belief in the strong synergy between traditional oil & gas production & an energy transition that is both environmentally & socially just for all.

**Time horizon**

Short-term

**Likelihood**

Very likely

**Magnitude of impact**

Medium-low

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

2,000,000

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

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

**Explanation of financial impact figure**

As this opportunity is in the beginning stages of assessment, it is difficult to quantify the financial impact. It is estimated that the impact of this would be up to \$2MM per year.

There is potential for significant cost adjustments as well, as assets slated for abandonment would be repurposed to enable them to continue to generate energy.

**Cost to realize opportunity**

150,000

**Strategy to realize opportunity and explanation of cost calculation**

To further support identification of opportunities & engagement with stakeholders, Vermilion appointed sustainability leads in all of our BUs in 2017 & linked our Corporate

Sustainability team with our public & government relations staff in Europe for mutual support. Vermilion also has technical experts that provide input into renewable energy projects as they are identified. These teams are supported by Corporate Sustainability & HSE staff and have responsibilities specific to geothermal opportunities as these projects move through their preliminary stages. Examples of actions we have implemented to realize this opportunity are partnering with oil & gas production, & geothermal energy industry associations to combine our expertise for the advancement of lower carbon & renewable energy solutions.

Vermilion's expenditure related to the technical design of geothermal projects, and proactively discussing the application of technologies and methodologies of these projects between our business units is estimated to be less than \$0.15MM per annum. Further expenditures (i.e. capital investment associated with infrastructure) will be reported once the project design is complete.

## Comment

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### Identifier

Opp3

### Where in the value chain does the opportunity occur?

### Opportunity type

Products and services

### Primary climate-related opportunity driver

Shift in consumer preferences

### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

### Company-specific description

Under the Canadian Environmental Protection Act and based on the commitments made by the Canadian and Alberta governments relating to COP21, there is a commitment to reduce emissions for coal-fired power generation. With new regulation applying to all coal-fired power generating facilities and the fact that a number of power generating facilities in Alberta are nearing the end of their service life, the demand for natural gas is likely to increase as a result of increased utilization of combined cycle gas turbine (CCGT) power generation. The new emissions standard for coal-fired power generation is set to CCGT. Alberta has also committed to significantly reduce its demand on coal for power generation by 2050.

### Time horizon

Long-term

**Likelihood**

More likely than not

**Magnitude of impact**

Medium

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

54,000,000

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

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

**Explanation of financial impact figure**

The short term impact of this regulatory change on gas pricing is anticipated to be low and increase to medium in the mid to long term. Once the regulations have come into effect and the implementation period has occurred, there is a potential to see an impact on the marketable price and demand for natural gas. As a natural gas and oil producer, Vermilion would benefit from an increase in marketable prices for natural gas in our Canadian operations. Based on 2019 production, an increase in gas price of \$1 per MMBTU, the impact to sales would be approximately \$54MM.

**Cost to realize opportunity**

400,000

**Strategy to realize opportunity and explanation of cost calculation**

Vermilion, as a company that will play meaningful role in the energy transition that is unfolding globally, adheres to a value creation strategy through the execution of full cycle exploration and production programs focused on the acquisition, exploration, development and optimization of producing properties. As we move further into the energy transition, we foresee natural gas playing an impactful role as a less carbon intense fuel than other options (i.e. coal). In 2018, Vermilion continued to focus on the identification of resources and assets where we have the opportunity to apply our industry leading expertise to optimize production while reducing emissions. An example of our strategy to realize this opportunity is a large liquids rich gas play in Vermilion's central Alberta asset base. Our marketing team continuously seeks avenues to optimize return for our production and is actively pursuing options for our natural gas production that will enable Vermilion to achieve the best netbacks on production.

The costs associated with the management of changing commodity pricing as we move through the energy transition are built into our operating costs globally. Based on estimates, the costs for managing and realizing the benefit as a sustainability leader committed to the UN SDGs is \$0.4MM annually.

## Comment

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### Identifier

Opp4

### Where in the value chain does the opportunity occur?

Downstream

### Opportunity type

Products and services

### Primary climate-related opportunity driver

Ability to diversify business activities

### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

### Company-specific description

Vermilion maintains a diverse, stable portfolio of global oil and gas assets. Just as there is risk associated with poor operating practices and poor environmental performance resulting in an impact to our brand, our strong record of safe and socially conscious development of energy resources has provided opportunities for Vermilion to access and develop resources. This includes demonstrating to customers, such as natural gas suppliers to industrial and residential consumers, the environmental and social responsibility associated with our production, to provide competitive differentiation for supply chain considerations. It also includes developing new customers based on new products, such as our geothermal heat, for agricultural and residential uses. At Vermilion we see our commitment to sustainability as core to our business, which has provided important organizational focus on emissions quantification and management. As consumers become more aware and involved in the selection of where the energy they use comes from and its carbon intensity, we believe that Vermilion will continue to be a top quartile choice, providing opportunities not available to peer organizations.

### Time horizon

Long-term

### Likelihood

More likely than not

### Magnitude of impact

Medium

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

Yes, a single figure estimate

### Potential financial impact figure (currency)

36,630,305

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

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

**Explanation of financial impact figure**

The financial impact of changing consumer preferences is difficult to quantify. We foresee opportunities in two distinct areas. We see opportunity in consumers selecting premium energy products, with these products demanding a higher price than other energy sources on the market. Currently we estimate the potential impact of premium pricing in the long-term to be \$1-5 per BOE or \$36.6MM/yr (100,357 boe/d\*365days\*\$1/boe) based on \$1 at 2019 production levels). The second opportunity we have identified, and are already receiving benefit from, is access to more stringent markets, supported by our environmental and sustainability performance. Vermilion has entered into the German, Hungarian, Croatian, and Slovak oil and gas operations in the last several years. Our sustainability performance has supported our entry into these markets.

**Cost to realize opportunity**

750,000

**Strategy to realize opportunity and explanation of cost calculation**

Vermilion made the organizational change of making Integrated Sustainability one of our strategic objectives. This provided important organizational focus on matters like environmental performance and sustainability, including climate change. To further support this objective, Vermilion has continued to add personnel and expand job requirements to include objectives associated with climate change. Our strategy to realize this opportunity is to continue to support integrated sustainability, both with personnel who are experts in their field, as well as financially supporting programs and projects that reduce emissions while optimizing production. An example of this is the addition of personnel who have specific responsibilities associated with sustainability in our Business Units, including study and feasibility assessment of green energy generation (i.e. the expansion of our geothermal energy generation programs in France). Our continued focus on the distributed production of energy products in our operating regions globally support the realization of this opportunity.

The funds associated with integrated sustainability are built into the operating costs of our producing regions, as well as corporate groups. Based on 2019 estimates, the financial expenditure associated with managing this opportunity was \$0.75MM.

**Comment**

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**Identifier**

Opp5

**Where in the value chain does the opportunity occur?**

Downstream

**Opportunity type**

Energy source

**Primary climate-related opportunity driver**

Shift toward decentralized energy generation

**Primary potential financial impact**

Other, please specify

Reputational benefits resulting in increased demand for goods/services

**Company-specific description**

The carbon intensity of energy utilized around the world has a direct relationship with where the energy product was generated. Vermilion's strategy focuses on a differential model including an organization model consisting of decentralized Business Units to effectively manage our geographic footprint, which consists of three stable regions (North America, Europe and Australia) that provide flexibility to be an energy generation partner for the local market. This strategy results in the significant reduction of the carbon footprint of our energy when compared to non-local sources, and also influences our acquisition strategy. We understand that as we take over operations that have a higher emissions profile than the average that exists in our portfolio, not only our absolute emissions will increase, but also, in the short term, our emissions intensity. Our approach is to substantially reduce emissions from these operations, elevating their performance to our own standards, which in turn improves the industry's performance as a whole and creates benefits for our local landowners, communities and our customers. We achieve this through more efficient operating practices that reduce the fossil fuels used in the production process, pro-active management of fugitive emissions, reduction of spills, and reduction of water use. We believe that our consistent track record, as demonstrated by the reduction in emissions associated with our Canadian acquisitions, shows our stakeholders that Vermilion is an operator of choice.

For example, as described in Section 4 (Targets and performance), following the April 2014 (Elkhorn) and May 2018 (Spartan) asset acquisitions, we set targets to reduce the flaring and venting emissions associated with the assets by 50% by 2020 and 2024, respectively. As of 2019/12/31, the 2020 (Elkhorn) targets have been exceeded and we are well on our way to meeting the 2024 (Spartan) targets.

It is important to note that these assets would have been in production regardless of whether we were the operators. Once we take over assets that were previously in production with less efficient and less emissions-conscious companies, we substantially reduce emissions. More information on this can be found in the CDP Case Study on Vermilion -- How an oil and gas company survives the low-carbon transition.on

**Time horizon**

Long-term



**Likelihood**

Very likely

**Magnitude of impact**

High

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

223,630,208

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

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

**Explanation of financial impact figure**

Vermilion's business strategy supports the distributed generation of energy products into local markets. We see access to markets outside of Canada to be something that sets Vermilion apart from our peers. Based on an operating netback (sales) basis, compared against 2019 production, the financial premium of our non-Canadian assets was \$450MM. The potential impact on a go-forward basis is anticipated to increase as we expand production in markets outside of North America and provide sources of energy to local markets.

**Cost to realize opportunity**

10,835,000

**Strategy to realize opportunity and explanation of cost calculation**

Vermilion continues to look at where we can access local markets for our production, while exploring regions to expand our operations. Our ongoing focus on emission reduction and integrated sustainability will guide Vermilion through the upcoming energy transition. The actions taken in the past several years, including 2019, to realize this opportunity include alterations to our structure, our strategic objectives and our operational development plans to support Vermilion as a distributed energy provider. Examples of changes made to support being a distributed energy provider include the addition Board and Executive oversight related to Integrated Sustainability in 2018. Vermilion also initiated exploration and development programs in regions with relatively low energy production as compared to consumption (e.g. Hungary, Croatia). In 2018, we also assumed operatorship of the Corrib gas field in Ireland and increased our ownership in the project from 18.5 to 20%. We have also expanded our regions to include Slovakia as an area for which a domestic energy supply would increase energy security while providing environmentally and socially responsible production.

The costs associated with adjustment of our organizational structure are built into our costs across the organization. Our acquisition, development and exploration capital

expenditures in Hungary, Croatia, Slovakia, and Ireland to the end of 2018 were \$10.8MM.

## Comment

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### Identifier

Opp6

### Where in the value chain does the opportunity occur?

Downstream

### Opportunity type

Markets

### Primary climate-related opportunity driver

Access to new markets

### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

### Company-specific description

In an effort to reduce airborne emissions from ships, the International Marine Organization (IMO), adopted the Protocol to the International Convention for the Prevention of Pollution from Ships, known as MARPOL Annex VI, which currently regulates air emissions from 95.4% of the worlds' shipping tonnage. More stringent global measures to reduce emissions from individual ships by 30 per cent by 2030, established through amendments to MARPOL Annex VI, came into force on Jan1 2020, limiting the sulphur content of bunker fuel to a maximum of 0.5%.

Vermilion's Australian Wando facility produces 4500 bbl/d of low sulphur crude oil that will be sought by refineries in the short term to meet IMO regulations.

### Time horizon

Short-term

### Likelihood

Virtually certain

### Magnitude of impact

High

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

Yes, a single figure estimate

### Potential financial impact figure (currency)

49,275,000

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

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

#### **Explanation of financial impact figure**

Vermilion's business strategy supports the distributed generation of energy products into local markets. We see access to markets outside of Canada to be something that sets Vermilion apart from our peers. Wandoo production has a low sulphur content which makes it attractive for refineries in need of this low sulphur feedstock to meet the new IMO regulations. Vermilion conservatively foresees achieving a premium of \$10/bbl for its Wandoo production over the next three years for cumulative incremental revenue of \$49.3MM (4500 bl/d\*365days \*\$10/bbl) x 3 years.

#### **Cost to realize opportunity**

300,000

#### **Strategy to realize opportunity and explanation of cost calculation**

Vermilion continues to look at where we can access local markets for our low sulphur production, while exploring regions to expand our operations. Our Marketing group ensures that Vermilion meets its contractual obligation with our buyers in terms of volumes, delivery dates and crude quality, and maintain our reputation of being a reliable source of low sulphur feedstock to refineries. The cost to realize this opportunity corresponds to the salary of half a full time equivalent employee on the marketing team and is estimated at \$0.3MM (0.5 \* FTE cost of \$0.2MM/yr \* 3yrs).

The cost of the marketing staff is built into company General and Administrative costs .

#### **Comment**

## **C3. Business Strategy**

### **C3.1**

#### **(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?**

Yes, and we have developed a low-carbon transition plan

### **C3.1a**

#### **(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?**

Yes, qualitative and quantitative

### C3.1b

**(C3.1b) Provide details of your organization’s use of climate-related scenario analysis.**

Climate-related scenarios and models applied	Details
2DS IRENA IEA Sustainable development scenario IEA NPS Other, please specify BP Evolving Transition Scenario, Shell Sky Scenario, BP Rapid Transition Scenario	<p>Vermilion examines &amp; reassesses climate risk-including a 2D scenario &amp; the potential impacts-at least annually, more frequently as needed. Our modelling focuses on the primary energy component of the value chain with inputs from our BUs &amp; Corporate groups including but not limited to prospect inventory, development schedule, economic inputs including carbon liability, market dynamics, energy &amp; carbon efficiency, infrastructure optimization, regulation/policy development &amp; distributed energy production. Our assumptions include but are not limited to impact from govts supporting a 2D scenario, stabilization of carbon pricing in the medium to long-term &amp; value associated with carbon intensity of energy. The outcomes inform our business strategy &amp; resource planning that support our competitive advantage rooted in operational efficiency, circular economy approaches &amp; renewable energy generation. As a result we are able to develop lower-carbon energy resources that can feed local markets.</p> <p>In addition, the Board, executive team &amp; senior mgmt, participated in a focused scenario analysis in 2019, examining two scenarios (World Economic Forum White Paper, September 2019, The Speed of the Energy Transition: Gradual or Rapid Change?) that compare a Gradual and Rapid transition, with the latter meeting Paris Agreement goals to limit global temperature increases to 1.5 to 2D. This analysis covered all areas of the organization, based on geography (all BUs) and product (oil, gas, geothermal).</p> <p>We selected these scenarios because they provide wide-ranging global thought on the energy transition, including credible experts &amp; global companies, &amp; an effective summary of complex inputs and analysis. The scenarios consider a timeline to 2050, which aligns with our focus on the SDGs (2030), the Paris Agreement (2050) &amp; our key operating regions: EU (climate-neutral by 2050) &amp; Canada (net-zero emissions by 2050). We consider this 30-year span to include critical long-term global ambitions, plus short- to mid-term horizons that provide for more concrete estimations and goal-setting.</p> <p>The Gradual scenario aligns with such scenarios as IEA New Policies Scenario &amp; BP Evolving Transition Scenario; Rapid scenario aligns with those such as IEA SDS &amp; IRENA.</p> <p>Based on these scenarios, we assessed the key factors impacting the energy transition, including influence of new energy technologies &amp; speed of adoption, changes in policy &amp; regulation, &amp; emerging markets such as India. We assessed related risks &amp; opportunities, impacts on the company</p>

	<p>&amp; strategies for resilience – overall &amp; by BU. Key results included regulatory &amp; policy changes as a major driver of a rapid transition, which is contributing to further development of our sustainability strategy through 2021, including furthering our current emission reduction targets. Overall, our strategy includes:</p> <ul style="list-style-type: none"> <li>- Lower carbon fuels: shifting our production mix since 2012 towards natural gas as a cleaner burning fuel &amp; focusing on reducing the carbon intensity of our oil &amp; gas, such as producing fuel to be used domestically, reducing the carbon footprint associated with transportation &amp; contributing to national energy security.</li> <li>- Greater energy efficiency: through energy and operational efficiency</li> <li>- Lower greenhouse gas emission intensity, with particular focus on methane.</li> <li>- Socially responsible fuels: ensuring our fuels are produced in the most environmentally &amp; socially responsible manner possible, respecting worker rights &amp; community engagement, operating in regions noted for their stable, well-developed fiscal and regulatory policies related to oil &amp; gas exploration &amp; development.</li> <li>- Renewable energy: continuing to develop geothermal energy via produced water, while researching conversion of traditional oil &amp; gas assets to geothermal.</li> </ul>
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### C3.1d

**(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.**

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	<p>As reported in sections 2.3 and 2.4, our products have already been impacted as a result of climate related risks and opportunities. An example of a risk case (Section 2.3, Risk 1) that is impacting Vermilion is the economy wide carbon tax in our operations in Alberta, Canada. Current financial impacts associated with this (based on 2018 activity) was approximately \$1.18MM.</p> <p>Based on 2018 emission levels and the carbon liability assessment completed in 2018, the potential financial impact on a medium term basis across our operation is \$5.9MM – these impacts are dependent on potential regulatory changes, participation in output based pricing</p>

		<p>systems, interaction of emission reduction and green energy production across our business units, as well as a host of other factors. Vermilion actively manages this risk through our global Carbon Liability Assessment Tool, as well as ongoing assessment and implementation of sustainability projects in our operations globally (Reducing our emissions while optimizing production, thereby reducing our exposure).</p> <p>An example of a risk case that has the potential to impact Vermilion, but has not yet, is the change in consumer behaviours (Section 2.3, Risk 9). This risk is associated with the impacts from negative consumer views of the organization, and the potential impact on the loss of value on a per share basis (approximately \$156.3MM per \$1 of lost share value). This is considered long-term risk and is actively managed through our six strategic objectives, which include Integrated Sustainability. We also continue to examine how we can reduce our impact on climate change and while providing safe, secure energy to our consumers.</p> <p>An example of an opportunity related to our products and services that has the potential to impact our operations is increased revenue through demand for lower emission products and services (Section 2.4, Opp3). Vermilion is a producer of natural gas, which we believe will play a pivotal role in the transition to low emission sources of energy. In the long-term, we believe this will be demonstrated as higher natural gas prices in regions that utilize coal for power generation (I.e. Alberta). The magnitude of this impact, based on 2019 production levels, will be \$47MM per \$1 of change.</p> <p>Note: Timeframes referenced align with 2.1.</p>
Supply chain and/or value chain	No	<p>Based on our forecasting, we believe that our operations will be, but have not yet been impacted by this category. In addition to impacts reported under the products &amp; services section (I.e. the impact upstream in our value chain, in the short-term, of increased pricing on fuel due to carbon taxation and those cost flowing through from our vendors to Vermilion), we have identified 2 scenarios that are likely to impact our operations in the medium and long-term.</p> <p>An example of an opportunity in the medium-term that we believe will impact our operations is the impact from</p>

		<p>participation in the carbon market. We foresee a potential for the generation of certified carbon credits from our operations that could be traded in Phase 4 of the EU ETS. The timeframe for Phase 4 of the EU ETS is 2021-2030 (Medium Term). The currently potential impact is estimated to be up to \$0.5MM per annum, pending regulatory amendments and the stabilization of credit pricing.</p> <p>An example of an opportunity downstream in our value chain that we believe will impact our operations is the impact associated with the shift in consumer preferences associated with sourcing their energy products. In the long-term, as society moves through the energy transition, there is a need for responsible producers of traditional sources of reliable energy. There will likely be a niche market for producers who are committed to sustainability and providing energy products to their customers at a tCO<sub>2</sub>e intensity better than others on the market. The magnitude of this opportunity is difficult to quantify, but it is estimated that the impact could be \$36.6MM to \$183.2MM (refer to 2.4, ID 4 for more details).</p>
Investment in R&D	Yes	<p>An opportunity that has and will continue to impact our business is the development and expansion of low emission goods and services (Section 2.4, ID 2). An example of the development of low emission goods/services is the application of ultra-deep geothermal energy generation in France. Our ongoing focus on the identification of geothermal energy generation potential from our assets is anticipated to increase revenues over the lifecycle of our infrastructure as well as decrease abandonment expenditures as assets are re-lived from conventional production to renewable energy generation.</p>
Operations	Yes	<p>Vermilion has identified 6 risks, and 1 opportunity that either are, or have the potential to impact our organization. Four of the identified risks are physical risks associated with climate change, including tropical cyclones, rising sea levels, changes in temperature extremes and changes in precipitation extremes. The impacts of these risks include physical damage to our assets (\$21MM – Cazaux battery, \$129 – Wandoo B platform and \$21MM – Garijp plant), loss of production capacity (\$6.3MM- Cazaux Lege fields, \$105MM – Wando field, \$54MM - Garijp field) and environmental clean-up \$8MM– Garijp field). Note that all costs are before mitigation (i.e. Insurance). To manage these risks, Vermilion employs a number of mitigation</p>



		<p>techniques including insurances, acceptance of risk, investment in response capabilities, and structural changes supporting integrated technical teams in each Business Unit to support ongoing operational changes advancing our operational excellence. We believe that ongoing assessment and optimization of operations, as well as the ability to respond to non-operational events, is key to reducing the impact of climate related physical risks.</p> <p>An opportunity that has not impacted our organization yet, but has the potential to, is the additional demand associated with changes in temperature extremes. As consumer focus shifts more toward local energy products and lower carbon energy solutions, there is likely to be a market for sustainable energy companies. We believe that there will be additional demand and resource allocation opportunities for organizations who are committed to sustainability and the UN Sustainable Development Goals. The magnitude of this opportunity, based on 2019 production levels, if demand were to increase and the prices of natural gas and oil were to shift, the impact to sales in Canada alone is estimated to be ~\$54MM.</p>
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### C3.1e

**(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.**

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures Acquisitions and divestments Access to capital Assets Liabilities	Revenues The outcomes of our risk assessment process directly impact planning in all scenario analysis completed. We have identified the potential for additional revenue in the next 10-20 years from returns on investment in low-emission technology (via sale of carbon credits from emission reduction initiatives – 2.4, ID 1), geothermal projects (2.4, ID 2) & the expansion of favorable markets resulting from low emission goods and services (2.4, ID 3). The magnitude of impacts per annum, above the financial implication reported in 2.4 (\$0.5MM, \$2MM & \$54MM per \$/MMBTU respectively), are expected to be associated with greater access to consumers thereby increasing the price for our products. New limit on sulphur content of bunker fuel used by the shipping industry will generate premium pricing for our low sulphur Wandoo field production (2,4 ID 6), increasing revenue by \$16.5mm/yr in the next

	<p>three years.</p> <p>The potential impacts are built into our project management assessment framework, which includes economic factors and impact on sustainability.</p> <p><b>Direct Costs</b></p> <p>Through our Corporate Risk Assessment and management process, we have identified 5 cases related to climate change that either have or could impact operating expenditures: financial impact associated with regulation and taxation &amp; impact from physical risks. Regulation &amp; taxation risks include realized increased operational cost due to carbon taxation (Section 2.3, Risk 1) &amp; potential increased operational cost of changes in regulation (Section 2.3, Risk 4). The magnitude of these risks has the potential to be \$5.99MM and \$2.0MM per annum respectively. The 2019 realized impact of carbon taxation on our business is about \$1.6MM.</p> <p>Physical risks that either have impacted or could impact our operating costs include changes in temperature extremes (Section 2.3, Risk 5), changes in precipitation (Section 2.3, Risk 6), &amp; the frequency &amp; intensity of cyclones/storms (Section 2.3, Risk 8). The magnitude of these impacts varies from \$0.5MM per day to \$234MM due to damage to assets, business interruption and environmental clean-up and 3rd party liability (total impact before insurance).</p> <p>Vermilion has adjusted our financial planning associated with development activities to mitigate the impacts from delays related to weather extremes, including supplemental emergency response training &amp; equipment to manage the impacts from cyclones or strong storms. To manage the impacts of taxation &amp; regulation, we proactively review our infrastructure to reduce our emissions &amp; engage regulators &amp; government on policy. We have also developed internal expertise on carbon taxation related to our operations, which supports our risk management.</p> <p><b>Capital Expenditures</b></p> <p>All climate related risks quantified in our Corporate risk register are considered during the allocation of capital for development. This is an integrated portion of our project management framework to ensure that the capital that we invest is both effective and resilient. An example of how a risk scenario impacted capital allocation is the facility planning adjustments and re-engineering project completed in relation to product efficiency regulations and standards (Section 2.3, ID 3). Vermilion proactively conducts operational and engineering reviews aimed at increasing efficiency, including reducing emissions and monetary expenditure requirements at major facilities. The magnitude of this impact, specific to the expenditure of capital to manage this risk, is anticipated to be \$2MM per annum.</p>
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		<p><b>Acquisitions and Divestments</b>  Climate related risks, among other risk factors, are assessed and quantified during acquisition &amp; divestment activities, including the impact from current regulation, as well as potential short-term regulatory changes, using our Global Carbon Liability Tool. This is also used to assess current &amp; potential future impacts of the price of carbon, is included when we assess the value of an asset package. E.g. our carbon liability assessment on our 2018 acquisition of Spartan Energy. This is used by the integration team to identify opportunities to reduce emissions while optimizing production. The magnitude of the work completed against this category depends on the size of the acquisition or divestment. On larger acquisitions, this can have impacts to valuations in the tens of millions of dollars.</p> <p><b>Access to Capital</b>  As the investment community continues to add focus to sustainability factors, the expansion of access to capital to companies with a strong track record of sustainability performance will increase. Sustainability performance is integral to our business and is positively correlated to our strong shareholder returns. When compared to a 5-Year Total Return, comparing Sustainalytics, CDP and SAM scoring, all indicate that strong sustainability performance positively correlates to the shareholder returns. The magnitude of the impact of sustainability performance on access to capital will likely be industry wide.</p> <p><b>Assets</b>  We have adjusted our strategy as a company to ensure that Integrated Sustainability is engrained in our operations by making it 1 of 6 strategic objectives. Risk cases associated with the price of carbon as well as changing regulation have had, and will continue to have, an impact on our assets: e.g., the long-term impact in our France operations associated with the cessation of in-country oil production. As governments adjust regulations &amp; expectations to support COP21 NDCs, we anticipate continued energy landscape changes. We also see opportunities associated with the energy transition: e.g. ultra deep geothermal in France. Based on 2019 revenue levels, the magnitude of cessation of production in France, on a funds flows from operations basis, would be \$219.5MM.</p> <p><b>Liabilities</b>  Re liabilities, Vermilion has identified opportunities associated with re-living depleted oil &amp; gas assets to support geothermal energy, and we have adjusted our financial planning by committing to explore this with partners in our Netherlands and France operations. Building off the success &amp; learnings from our Tomato co-generation project in France,</p>
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		<p>we joined the Green Deal in NL in 2017, a partnership of 7 companies with the Dutch Government &amp; a non-profit research organization to investigate geothermal energy generation from natural gas infrastructure. We undertook a geological evaluation of the available 3D seismics, &amp; concluded that the required Dinantien carbonate platform in Heerenveen is probably not present. While the project identified that this is not currently practical in our area of operation, it demonstrates our partnership approach to developing new products and services through research and development. In France, we continue as an active participant in the H2020 MEET partnership to advance geothermal systems exploration and production with real projects in existing industrial environments, with a timeline of 2021 to complete assessment &amp; recommendations.</p>
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### C3.1f

**(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).**

Our approach to sustainability, & to our business in general, is to prioritize health & safety, the environment & profitability, in that order. Best in Class HSE & Integrated Sustainability are 2 of our 6 key strategic objectives, resulting in environmental considerations being engrained in all areas of our business. This provides corporate direction for programs with potential to enhance our performance & operational efficacy. Progress is tracked on a monthly, quarterly & annual basis & shared across all levels of staff (Office, Field, management, senior management, etc.). The decision in 2015 to establish Integrated Sustainability as a strategic objective & in 2018 to establish our Board’s Sustainability Committee, supported previous alterations to our project management framework (site specific & play development level) to enhance aspects of sustainability & climate change (regulatory change, enhanced water management, emissions reduction, footprint reduction/ecosystem fragmentation minimization).

Sustainability is a core element of our long-term vision, the strategy we use to achieve that vision & how we evaluate our performance. As a result, sustainability-related risks & opportunities, including those related to climate, are integrated into multi-disciplinary company-wide risk identification, assessment, & management processes. As part of our ongoing cycle of risk identification, every BU in 2018 assessed all current identified risk cases to determine where climate-related risk is a contributing factor. These were incorporated into the Corporate Risk Review, and provided to the Board, including projected timelines & the mitigation or opportunity measures related to them. This process formalizes identification & assessment of climate-related risks and integrates them into the overall Enterprise Risk Management system, supporting the Board’s oversight of climate-related risks & business sustainability. The aspects of climate change that influence our strategy include but are not limited to: physical changes resulting from temperature change, regulatory changes, the need to adapt operations to changing climate extremes & the identification of green solutions in our communities. Our annual CDP submission and, starting in 2018, our Annual Report, include detailed descriptions of climate-specific risks, timeframes, likelihood of occurring, impact on the business & our resulting approach to managing them, including potential impacts of 2°C

scenarios. Our strategy to address the impact of these risks & ensure our resilience, focuses on:

- Lower carbon fuels. Since 2012, we have shifted our production mix towards natural gas as a cleaner burning fuel than other fossil fuels & we continue to focus on reducing the carbon intensity of our oil & gas. This includes producing fuel used within the country of production wherever possible, contributing to a reduced carbon footprint associated with transportation of the fuel to consumers & to increased national energy security.
- Greater energy efficiency. Many energy & operational efficiency initiatives go hand-in-hand, which helps us to minimize our carbon footprint & reduce greenhouse gas emissions.
- Lower greenhouse gas emission intensity. We are committed to reducing the greenhouse gas emissions associated with our production, with a focus on methane. This is a significant undertaking given that we do not have the benefit of a concentrated asset (as do many of our peers) that would support lower operational emissions. We therefore rely more heavily on innovation to reduce emissions.
- Socially responsible fuels. We operate in regions noted for their stable, well-developed fiscal & regulatory policies related to oil & gas exploration & development & for robust frameworks of health, safety, environmental & human rights legislation. We are committed to ensuring that our fuels are produced in the most environmentally & socially responsible manner possible, respecting worker rights and community engagement.
- Renewable energy. We are continuing to pilot geothermal energy, for which our internal expertise in engineering, geoscience & drilling is well suited. This work has begun with a focus on the geothermal potential of our produced water, supporting a circular economy model that conserves, reuses & recycles resources to better protect our environment. It is also expanding into other areas, including biogas & the conversion of traditional oil & gas assets to geothermal production.
- Transparency & reporting. We have established a strong record of reporting on greenhouse gas emissions, energy usage & other key climate metrics. This data is helping us to understand our opportunities for improvement, and we will continue to use it to determine emissions reduction targets.

Our metrics include significant EESG measures, & are reported in accordance with the comprehensive option of the GRI Standards. Climate-related metrics include but are not limited to:

- energy consumption & intensity
- greenhouse gas emission & intensity (Scopes 1, 2 & 3)
- investment in renewable energy
- flaring & venting volumes
- water withdrawals.

We use these & other metrics to monitor progress:

- measurement against our established targets
- performance benchmarking against our peer group
- performance benchmarking against recommendations from industry & third-parties

Because sustainability objectives are included in our long-term vision, progress drives both company & individual staff performance. In 2018, we enhanced our 2019 corporate

performance scorecard to include sustainability performance for both executive & staff compensation. Results are now directly tied with our rewards system.

Our Executive Chairman has made it clear that it is critical that we continue to develop & expand reliable, secure & cost-effective sources of renewable energy. Our focus on sustainability & integrating opportunities into our business strategy provides a distinct competitive advantage by enabling us to optimize the energy-generating life of our assets, while reducing near-term abandonment expenditures.

We are committed to being compliant in all BU regulatory regimes while providing long-term growth & income to our investors. Many of our initiatives also have a lasting positive impact in the communities we operate. These are primary drivers for identification & implementation of climate change initiatives. These are assessed on a project-specific basis, including benefit to the communities where we operate and the environment (reduced carbon emissions or fuel consumption, etc.) & financial considerations. Our geothermal projects in France, expanding into The Netherlands, in which we provide heat from our produced water to agricultural & residential sectors, are already demonstrating that oil & gas companies such as ours can not only participate in renewable energy production, but lead it.

## C4. Targets and performance

### C4.1

**(C4.1) Did you have an emissions target that was active in the reporting year?**

Absolute target

#### C4.1a

**(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

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**Target reference number**

Abs 1

**Year target was set**

2014

**Target coverage**

Business division

**Scope(s) (or Scope 3 category)**

Scope 1

**Base year**

2014

**Covered emissions in base year (metric tons CO<sub>2</sub>e)**

193,399.7

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**

33

**Target year**

2020

**Targeted reduction from base year (%)**

50

**Covered emissions in target year (metric tons CO<sub>2</sub>e) [auto-calculated]**

96,699.85

**Covered emissions in reporting year (metric tons CO<sub>2</sub>e)**

18,373.2

**% of target achieved [auto-calculated]**

180.9997637018

**Target status in reporting year**

Achieved

**Is this a science-based target?**

No, but we anticipate setting one in the next 2 years

**Please explain (including target coverage)**

In April 2014, Vermilion closed the acquisition of a small, privately held company (Elkhorn Resources Inc.) with light-oil assets in SE Saskatchewan. In line with our corporate priority of identifying initiatives that reflect our focus on Health, Safety and Environment, Integrated Sustainability, and Operational Excellence, a target was set in 2014 to reduce flaring and associated emissions from this operation by 50% by 2020. This has resulted in a significant and ongoing focus on the reduction of flaring and vented solution gas at these sites.

Beginning in 2015 and continuing through 2019, the construction of new infrastructure, operational changes, and increased infrastructure runtimes have reduced emissions in our former Elkhorn assets by approximately 90% (Current Year Emissions 18,373.2 tCO<sub>2</sub>e / Base Year Emissions 193,399.7 = 90.5% reduction to date). This reflects an approximately 181% success rate in relation to our 2020 target of a 50% reduction over 2014 emission levels  $[(193,999.7 - 18,373.2)/(193,999.7 \times 50\%) = 181\%]$ .

Year over year, flaring and venting emissions from the former Elkhorn assets were reduced by  $(30,296 - 18,373) = 11,923$  tCO<sub>2</sub>e between 2018 and 2019.

The target applies to our Canadian Business Unit.

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**Target reference number**



Abs 2

**Year target was set**

2018

**Target coverage**

Business division

**Scope(s) (or Scope 3 category)**

Scope 1

**Base year**

2018

**Covered emissions in base year (metric tons CO<sub>2</sub>e)**

374,515.8

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**

73

**Target year**

2024

**Targeted reduction from base year (%)**

50

**Covered emissions in target year (metric tons CO<sub>2</sub>e) [auto-calculated]**

187,257.9

**Covered emissions in reporting year (metric tons CO<sub>2</sub>e)**

274,545.2

**% of target achieved [auto-calculated]**

53.3865860933

**Target status in reporting year**

Underway

**Is this a science-based target?**

No, but we anticipate setting one in the next 2 years

**Please explain (including target coverage)**

In May 2018, Vermilion acquired Spartan Energy Corp., a publicly traded oil & gas company headquartered in Calgary, Alberta. A major addition, the acquisition of Spartan resulted in an approximately 30% increase to our Alberta and Saskatchewan production in relation to 2017 totals. Consistent with our corporate on Health, Safety and Environment, Integrated Sustainability and Operational Excellence, and similar to the 2014 Elkhorn acquisition (ABS1), a target was set in 2018 to reduce flaring and venting emissions associated with the Spartan assets by 50% by 2024. Similar to Elkhorn, this reduction is being accomplished through a variety of gas conservation and recovery

initiatives including the construction of new infrastructure, and implementation of enhanced operational practices and technology.

Infrastructure changes and performance optimization activities undertaken by Vermilion subsequent to the acquisition have reduced flaring and venting emissions from the former Spartan assets by approximately 26.7% (Current Year Emissions 274,545.2 / Base Year Emissions 374,515.8 = 26.7% reduction to date). This reflects an approximately 53% success rate in relation to our 2024 target of a 50% reduction over 2018 emission levels  $[(374,515.8 - 274,545.2) / (374,515.8 \times 50\%) = 53.4\%]$ .

On an annualized basis, flaring and venting emissions from the former Spartan assets were reduced by  $(374,516 - 274,545) = 99,971$  tCO<sub>2</sub>e between 2018 and 2019.

The target applies to our Canadian Business Unit.

## C4.2

**(C4.2) Did you have any other climate-related targets that were active in the reporting year?**

Target(s) to reduce methane emissions

### C4.2b

**(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.**

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**Target reference number**

Oth 1

**Year target was set**

2014

**Target coverage**

Business division

**Target type: absolute or intensity**

Absolute

**Target type: category & Metric (target numerator if reporting an intensity target)**

Methane reduction target

Total methane emissions in CO<sub>2</sub>e

**Target denominator (intensity targets only)**

**Base year**

2014

**Figure or percentage in base year**

16,757.95

**Target year**

2020

**Figure or percentage in target year**

8,379

**Figure or percentage in reporting year**

7,469.4

**% of target achieved [auto-calculated]**

110.855775485

**Target status in reporting year**

Achieved

**Is this target part of an emissions target?**

This is part of Target ID ABS1

**Is this target part of an overarching initiative?**

No, it's not part of an overarching initiative

**Please explain (including target coverage)**

This is a proportionate target associated with our target to reduce flaring and venting emissions from our former Elkhorn assets by 50% by 2020 (ABS1). The target represents an 8,379 tCO<sub>2</sub>e reduction in methane emissions (Baseline = 16,758 x 50% = 8,379 tCO<sub>2</sub>e).

Similar to ABS1, the operational response to the target has been comprised of multiple projects with a broad impact to a variety of emission sources. The inputs reported against this target reflect our reporting year as quantified and reported through CDP (January 1 through December 31). As of December 31, approximately 110% of the target has been achieved  $(16,758 - 7,469) = 9,289$  tCO<sub>2</sub>e methane;  $9,289 / 8,379 = 110\%$ .

A similar emission reduction target has been established in relation to our 2018 acquisition of acquisition of Spartan Energy Corp (OTH2).

The target applies to our Canadian Business Unit.

---

**Target reference number**

Oth 2

**Year target was set**

2018

**Target coverage**

Business activity

**Target type: absolute or intensity**

Absolute

**Target type: category & Metric (target numerator if reporting an intensity target)**

Methane reduction target

Total methane emissions in CO<sub>2</sub>e

**Target denominator (intensity targets only)**

**Base year**

2018

**Figure or percentage in base year**

163,182.3

**Target year**

2024

**Figure or percentage in target year**

81,591

**Figure or percentage in reporting year**

111,831.3

**% of target achieved [auto-calculated]**

62.9368572385

**Target status in reporting year**

Underway

**Is this target part of an emissions target?**

This is part of Target ID ABS2

**Is this target part of an overarching initiative?**

No, it's not part of an overarching initiative

**Please explain (including target coverage)**

Similar to our Elkhorn target (OTH1), this is a proportionate target associated with our target to reduce flaring and venting emissions from our former Spartan assets by 50% by 2024 (ABS2). The target represents an 81,591 tCO<sub>2</sub>e reduction in methane emissions (Baseline = 163,182 x 50% = 81,591 tCO<sub>2</sub>e).

Similar to ABS1, the operational response to the target consists of multiple projects with impact on a variety of emission sources. Infrastructure changes and performance

optimization activities undertaken subsequent to the acquisition have reduced methane emissions from the former Spartan assets by approximately 31% (Current Year Emissions 111,831.3 tCO<sub>2</sub>e / Base Year Emissions 163,182.3 = 31.5 % reduction to date). This reflects an approximately 63% success toward our 2024 target of a 50% reduction over 2018 emission levels (163,182.3 - 111,831.3 = 51,351 tCO<sub>2</sub>e; 51,351/81,591 = 62.9%).

On an annualized basis, methane emissions from the former Spartan assets were reduced by approximately (163,182.3 - 111,831.3) = 51,351 tCO<sub>2</sub>e between 2018 and 2019.

The target applies to our Canadian Business Unit.

### C4.3

**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

#### C4.3a

**(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO<sub>2</sub>e savings.**

	Number of initiatives	Total estimated annual CO <sub>2</sub> e savings in metric tonnes CO <sub>2</sub> e (only for rows marked *)
Under investigation	5	0
To be implemented*	3	35,958
Implementation commenced*	1	47,313
Implemented*	20	145,478
Not to be implemented	0	0

#### C4.3b

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

.....

#### Initiative category & Initiative type

- Energy efficiency in production processes
- Other, please specify
  - Gas Conservation and Optimization

**Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)**

145,500

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

1,140,000

**Investment required (unit currency – as specified in C0.4)**

8,000,000

**Payback period**

11-15 years

**Estimated lifetime of the initiative**

21-30 years

**Comment**

To achieve the targets identified in Sections 4.1 and 4.2, and in line with our strategy of acquiring production from higher emission intensity companies and then improving operations under our control, Vermilion continues to apply company-wide focus on the reduction of flared and vented gas, particularly at our SE Saskatchewan locations. Emissions-oriented activities that were implemented wholly or in part in 2019 include, but aren't limited to, the construction of new or retrofitted facility infrastructure (88,600 tCO<sub>2</sub>e/year), installation of new or expanded gathering systems to bring additional gas to market (41,000 tCO<sub>2</sub>e/year), installation of vapour recovery units (VRUs) to eliminate flaring and venting (11,400 tCO<sub>2</sub>e/year), and shutting-in uneconomical assets (4,550 tCO<sub>2</sub>e/year). Consistent with our objectives of optimizing production while minimizing our emissions intensity, all of the emission reduction projects also met Vermilion's economic criteria prior to being implemented.

The costs to implement the gas conservation initiatives are generally aggregated within other capital programs. To date, the costs incurred in relation to our ongoing emission reduction initiatives in SE Saskatchewan exceed \$8MM. Payback periods are project-specific and in some cases exceed the life of the asset. On average, the payback period for our recent SE Saskatchewan initiatives based on solely on the realized price of conserved gas is approximately 12 years.

---

**Initiative category & Initiative type**

Energy efficiency in production processes

Other, please specify

Installation of low-bleed pneumatic devices

**Estimated annual CO2e savings (metric tonnes CO2e)**

40,600

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Mandatory

**Annual monetary savings (unit currency – as specified in C0.4)**

515,000

**Investment required (unit currency – as specified in C0.4)**

610,000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In response to evolving regulatory requirements in Alberta, a total of 728 high-bleed pneumatic devices were converted to low-bleed units in our Canadian Business Unit. Based on equipment specifications, this equipment retrofit is expected to result in an approximately 40,600 tCO2e/yr reduction in vented emissions.

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**Initiative category & Initiative type**

Energy efficiency in production processes

Other, please specify

Installation of low emission, remote power generating units

**Estimated annual CO2e savings (metric tonnes CO2e)**

150

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

110,000

**Investment required (unit currency – as specified in C0.4)**

460,000

**Payback period**

4-10 years

**Estimated lifetime of the initiative**

Ongoing

**Comment**

Although modest in relation to some of the larger infrastructure initiatives, a project that we feel demonstrates the breadth of consideration that Vermilion applies to emissions reduction opportunities involves the replacement of traditional thermoelectric (TEG) power generating devices at remote production sites to hybrid solar/methanol fuel cell units. Unlike TEG units which run (and therefore consume fuel) continuously, the hybrid units run on demand only. Based on manufacturer specifications, this reduction in operating time is expected to result in a greater than 99% emissions reduction in relation to the TEG units.

Conceptualized in 2017 with implementation ongoing, a total of 22 hybrid units have been installed to date at 11 locations in Alberta, with additional 14 units scheduled for installation in 2020. Based on a specified emissions reduction of approximately 8.2 kg CO<sub>2</sub>e/KWh, the units installed to date represent an annual CO<sub>2</sub>e savings of approximately 150 tonnes/year, which is expected to increase to approximately 250 tonnes/year in 2020.

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**Initiative category & Initiative type**

Low-carbon energy consumption  
Hydropower

**Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)**

42,400

**Scope(s)**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

43,233

**Payback period**

>25 years

**Estimated lifetime of the initiative**

>30 years

**Comment**



In our Netherlands Business Unit, we have moved to acquire all of our purchased electricity from certified renewable sources. If Vermilion had not made the decision to purchase green power, based on information from our suppliers, our emissions would have been approximately 42,400 tCO<sub>2</sub>e. It is important to note that Vermilion began purchasing the majority of our electrical power under a green energy package from our power provider in 2016. It was decided to purchase a certified renewable power certificate that would cover greater than 100% of our Scope 2 energy use.

### C4.3c

#### (C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Employee engagement	Vermilion's structure and culture is designed to foster the sharing of ideas and garner maximum benefit from the expertise and experience of our staff, consultants and management. In addition to regularly held Business Unit meetings and international subject matter expert (SME) meetings, designed to facilitate the sharing information and learnings between all organizational groups, Vermilion hosts four events per annum where employees are encouraged to openly share ideas and provide questions and feedback on the company, its performance, corporate strategy and initiatives that they believe would benefit the organization. Considerations are provided to enable staff to provide feedback both verbally in the meeting as well as anonymously. Vermilion also hosts an annual weeklong Global Operational Leadership conference. During this week, 25% of the agenda items at this conference are focused around HSE and Sustainability strategies and actionable plans. In addition to these corporate events, regular HSE meetings are held in all Business Units, as well as town hall meetings, where employees are encouraged to discuss ideas and provide feedback. Our intranet also offers a "suggestion box" tool that is available to all staff. This frequently results in suggestions becoming actions and improvements in areas throughout the company.
Compliance with regulatory requirements/standards	One potential driver for Vermilion's emission oriented projects is the year-over-year reduction expectation defined by regulators in the countries in which we operate. This is one of the factors considered when Vermilion assesses emission reduction activities. We note that Vermilion assesses many factors associated with investment in all projects, including but not limited to, potential impact to the communities in which we live and work, potential sustainability impacts (HSE, energy use, water use, land protection, etc., and financial considerations.
Financial optimization calculations	As part of Vermilion's commitment to operational excellence, we are continuously seeking to find new, more efficient ways to produce our products and maximize shareholder returns. An example of this is the

	<p>many optimization activities undertaken in Vermilion's Business Units that have a positive effect on fuel consumption and emissions. While having a positive impact on emissions and changing Vermilion's emission profile on a go forward basis, these activities typically also reduce financial outlay. This is an example of Vermilion utilizing our expertise to advance projects that will have an ongoing positive impact to the communities where we live and work and our sustainability goals while providing stable shareholder value and growth.</p>
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## C4.5

**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?**

Yes

## C4.5a

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**

---

**Level of aggregation**

Product

**Description of product/Group of products**

Petroleum Natural Gas in Canadian Market

**Are these low-carbon product(s) or do they enable avoided emissions?**

Avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify

Realized energy content coal to natural gas.

**% revenue from low carbon product(s) in the reporting year**

6.3

**Comment**

We recognize that the energy transition is occurring and we are committed to playing an important roll in the transition. At the same time, we are realistic that oil and gas consumption will continue during the transition, and will likely increase over the next few decades. Sustainability-oriented investors, governments and citizens will effect their greatest positive impact by turning turn to Best-In-Class operators like Vermilion during this transition. Vermilion continues to provide focus to the production of natural gas and natural gas liquids, which will be an important energy source during the energy transition in the coming years. In 2019, Vermilion's production was approximately 52% weighted

natural gas and natural gas liquids to oil production. Through the production of petroleum natural gas, Vermilion provides the market with a power generation alternative which achieves greater energy efficiency and up to 45% cleaner burning than coal fired electricity generation (based on recently published information from the National Energy Board, on a gCO<sub>2</sub> per MJ basis - ECCC, Table A.6). Alberta has committed to shift electricity generation from the current coal dominated market to a more balanced market dominated by combined cycle gas turbine generation in 2050. Based on this commitment, Vermilion's natural gas will provide a significantly less carbon intense energy source. Based on the annual sales volume in Canada in 2019 and current information relating to the emissions intensity of power generation, a third party would have been able to avoid over 2900 ktonnes of CO<sub>2</sub>e per annum, as compared to power generated by a coal fired plant, based on the HHV of processed natural gas and a carbon intensity of 90.87 grams of CO<sub>2</sub>e per MJ for a coal fired power generation dominated energy grid vs 49.88 grams of CO<sub>2</sub>e per MJ for natural gas power generation.

## C-OG4.6

### **(C-OG4.6) Describe your organization's efforts to reduce methane emissions from your activities.**

Similar to other upstream oil and gas production, the majority of methane emissions from Vermilion's operations stem from venting, flaring (recognizing that flaring typically achieves an approximate 98% combustion efficiency), storage emissions, and process/instrumentation emissions. At this time, we see the greatest opportunities to reduce methane emissions in our projects and programs surrounding leak detection and repair (see Section 4.7) and our efforts to reduce flaring. Examples of our methane reduction efforts are the emission targets set for our former Spartan (acquired in 2018) and Elkhorn (acquired in 2014) assets (Reference 4.2b). Both of these ongoing programs consist of a number of different types of projects, including the construction of new infrastructure, tying gas production into gathering systems to bring additional gas to market (and thereby reduce flaring and associated methane emissions), and installing vapour recovery tanks with gas management to limit fugitive methane emissions.

The methane reduction target associated with the Elhorn assets (target year 2020) has been exceeded. Emission reduction activities undertaken by Vermilion in relation to the Spartan assets (target year 2024) have resulted in greater than 50% progress towards this emission reduction target in the first ~ 18 months of operatorship.

## C-OG4.7

### **(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?**

Yes

## C-OG4.7a

**(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.**

In all of our operations, we understand the integrated nature of Operational Excellence, Best-In-Class Health, Safety & Environment, and Integrated Sustainability (3 of our 6 strategic objectives). Vermilion's method for elimination of methane leakage is simple: If a leak is identified, it is fixed.

Vermilion has a robust emissions quantification program in all operated business units. We also have fugitive emission programs in place that are managed through our operations groups in each business unit, with the exception of our offshore platform in our Australia operation (an oil asset with no natural gas production infrastructure). Our Leak Detection and Repair (LDAR) program varies between business units:

**CBU:** We currently perform limited quantitative LDAR that is targeted (for example, identifying leaks during a turnaround) as opposed to a gross percentage of our assets on an annual basis. In addition to our targeted quantitative LDAR program, we currently perform LDAR dominated by Operations identification (qualitative). The scope of both of these programs work covers over 90% of our assets in Canada on an annual basis. Targeted identification such as identification of leaks during facilities work is also built into all turnaround activities within the CBU.

**FBU:** Quantitative LDAR programs vary annually. As this is an oil-dominated asset, the volume of natural gas and associated CH<sub>4</sub> emitted is low. A specific focus with LDAR is the VBH site as we have more gas associated to oil. A specific fugitive emissions audit was carried out at VBH in 2017 with no leak detected.

**NBU:** Netherlands has a robust LDAR program, with 25% of the accessible flanges and potential leak points screened quantitatively on an annual basis.

**ABU:** This is an oil asset with no natural gas production infrastructure. Any associated gas is either utilized in on-platform processes to displace fuels we would have to bring from the mainland, such as diesel, or maintained within the process and reinjected into the formation it was produced from. While we do not complete a formal LDAR program for natural gas, any significant potential leak sources would be identified by our continuous gas detection monitoring system (line of sight and point source) or through on-platform crew visual inspections. Where required equipment is repaired and pressure/leak tested prior to return to service.

**USBU:** The USBU has a comprehensive leak detection and repair program that includes initial and semi-annual monitoring for fugitive emissions using a thermal camera at all wellsites that are subject to OOOOa and/or Wyoming air permit requirements. In addition to point source

identification, Vermilion has permanently mounted monitoring equipment at our major facilities that check for the presence of natural gas outside of the process on an ongoing basis.

GBU: All producing oil and disposal wells are thoroughly checked at least twice per week. Wells that are not in production are checked monthly. In our operated gas assets, all well sites and facilities are checked 5 times per week. Pipelines routes are inspected weekly in habituated areas and monthly in non-habituated areas. Oil and gas transportation pipelines are also helicopter surveyed on a biweekly basis.

IBU: In the first year of operation a Differential Absorption LIDAR (DIAL) Survey was completed to survey for methane and VOC Emissions. No significant emissions were observed from the areas measured. OGI surveys are completed on Corrib on a bi-annual basis and cover approximately 80% of accessible leak points. All identified leaks are managed through the operations weeps and seeps repair programme. To date 80% of all identified leaks are below the measurable leak detection rate for the High Flow Sampler.

According to a 2016 Environmental Defence Fund report (Improving Methane Disclosure in the Oil and Gas Industry), scientific studies on methane emissions from the natural gas and oil industries suggest that, in order to maximize the climate benefits of a transition from both diesel and coal to natural gas on all time scales, methane emissions from the industry must be limited to an emissions rate of 0.8%.

Within our emissions reporting scope, Vermilion's emissions ratio of CH<sub>4</sub> to CH<sub>4</sub> production is significantly lower than the EDF's recommendations, at 0.11% (on a V/V basis). When comparing CH<sub>4</sub> emitted to total hydrocarbon production (Within our emissions reporting scope), Vermilion's ratio is 0.060% (compared on a BTU basis). This value is a result of our commitment to methane detection and reduction, and we continue to examine areas where we could further improve.

On a go forward basis, Vermilion has teams in each business unit who are responsible to monitor regulatory development and share learnings with both BU teams, as well as corporate groups.

## C-OG4.8

### **(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization's efforts to reduce flaring, including any flaring reduction targets.**

During the production of petroleum energy products, some operational instances exist that make flaring a relevant and necessary part for the safe production of our oil and gas assets. Vermilion has reported on key climate-related metrics annually since 2012, which includes information associated with flaring related emissions.

As described in Sections 4.1a and 4.2b, Vermilion has made a commitment in the form of specific targets related to the reduction of flaring (and venting) emissions associated with our Elkhorn (acquired in 2014) and Spartan (acquired in 2018) Canadian assets. The Elkhorn emission reduction targets (target year 2020) have been substantially exceeded. Emission

reduction activities undertaken by Vermilion in relation to the Spartan assets (target year 2024) have resulted in greater than 50% progress towards the emission reduction targets in the first ~ 18 months of operatorship. Flaring and venting initiatives undertaken by Vermilion in relation to the Elkhorn and Spartan assets in 2019 resulted in emission reductions of 11,923 tCO<sub>2</sub>e and 99,970 tCO<sub>2</sub>e, respectively.

To achieve the emission targets set, Vermilion has provided significant focus on the reduction of flaring and vented solution gas at these sites through gas conservation. Beginning in 2015 and continuing through 2019 and into 2020, multiple initiatives including the construction of new infrastructure, tying gas production into gathering systems to reduce flaring, installing vapour recovery systems to limit fugitive methane emissions, and upgrading battery infrastructure have been undertaken. All projects that contributed to these reductions met Vermilion's economic criteria prior to being implemented.

## C5. Emissions methodology

### C5.1

**(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**

#### Scope 1

---

**Base year start**

January 1, 2012

**Base year end**

December 31, 2012

**Base year emissions (metric tons CO<sub>2</sub>e)**

1,011,525

**Comment**

Our Scope 1 base year emissions have been updated to account for the calendar year (pro rata) balance on our 2018 acquisitions and the change in operatorship of our Ireland asset. The update was undertaken in accordance with the GHG Protocol Base year recalculation methodologies for structural changes (Appendix E to the GHG Protocol Corporate Accounting and Reporting Standard).

#### Scope 2 (location-based)

---

**Base year start**

January 1, 2012

**Base year end**

December 31, 2012

**Base year emissions (metric tons CO2e)**

255,913

**Comment**

Our Scope 2 (Location based) base year emissions have been updated to account for the calendar year (pro rata) balance on our 2018 acquisitions and the change in operatorship of our Ireland asset. The update was undertaken in accordance with the GHG Protocol Base year recalculation methodologies for structural changes (Appendix E to the GHG Protocol Corporate Accounting and Reporting Standard).

**Scope 2 (market-based)**

---

**Base year start**

January 1, 2012

**Base year end**

December 31, 2012

**Base year emissions (metric tons CO2e)**

24,640

**Comment**

Our Scope 2 (Market Based) base year emissions were not affected by the structural changes in 2018 and have not been updated.

## C5.2

**(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009  
Australia - National Greenhouse and Energy Reporting Act  
European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations  
IPCC Guidelines for National Greenhouse Gas Inventories, 2006  
US EPA Mandatory Greenhouse Gas Reporting Rule  
Other, please specify  
See Section 5.2a

## C5.2a

**(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

Netherlands Long-term Agreements with Industry (MJA3)  
France Arrêté du 31 janvier 2008 relatif au registre et à la déclaration annuelle des émissions polluantes et des déchets

## C6. Emissions data

### C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO<sub>2</sub>e?

Reporting year

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**Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)**

858,822.3

**Comment**

### C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

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**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We are reporting a Scope 2, market-based figure

**Comment**

### C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO<sub>2</sub>e?

Reporting year

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**Scope 2, location-based**

279,962

**Scope 2, market-based (if applicable)**

8,383

**Comment**



## C6.4

**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

No

## C6.5

**(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.**

### **Purchased goods and services**

---

#### **Evaluation status**

Not relevant, calculated

#### **Metric tonnes CO<sub>2</sub>e**

44,791

#### **Emissions calculation methodology**

Scope 3 emissions related to Purchased Goods and Services were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol"). Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. An "Operational Control" approach as described in the Protocol was employed for the consolidation of Purchased Goods and Services. Emissions were calculated according to an environmental economic input-output methodology using the following steps: 1) Expenditures on purchased goods and services were identified from primary financial accounting data and sorted according to economic sector; 2) Emission factors, for different economic sectors, in units of tCO<sub>2</sub>e/\$ were formulated from WIOD national input output tables; 3) GHG emissions were calculated for each economic sector by multiplying expenditure totals with the relevant emission factors, followed by the summation of emissions for all economic sectors.

#### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

#### **Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

### **Capital goods**

---

#### **Evaluation status**

Not relevant, calculated

#### **Metric tonnes CO<sub>2</sub>e**

42,369

### **Emissions calculation methodology**

Scope 3 emissions related to Capital Goods were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol"). Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. An "Operational Control" approach as described in the Protocol was employed for the consolidation of Capital Goods. Emissions were calculated according to an environmental economic input-output methodology using the following steps: 1) Expenditures on capital goods were identified from primary financial accounting data and sorted according to economic sector; 2) Emission factors, for different economic sectors, in units of tCO<sub>2</sub>e/\$ were formulated from WIOD national input output tables; 3) GHG emissions were calculated for each economic sector by multiplying expenditure totals with the relevant emission factors, followed by the summation of emissions for all economic sectors.

### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

### **Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

## **Fuel-and-energy-related activities (not included in Scope 1 or 2)**

---

### **Evaluation status**

Relevant, calculated

### **Metric tonnes CO<sub>2</sub>e**

272,375

### **Emissions calculation methodology**

Scope 3 emissions related to Fuel-and-Energy Related Activities (Not Included in Scope 1 and 2) were calculated following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard "Protocol"). Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. Emissions were calculated using the Quantis Scope 3 Evaluator.

### **Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

### **Please explain**

Emissions were calculated based on Vermilion's internal source information.

## **Upstream transportation and distribution**

---

### **Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

101,417

**Emissions calculation methodology**

Scope 3 emissions related to Upstream Transportation and Distribution were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol") distance-based method, and a spend-based method. Total GHG emissions are exclusive of any biogenic CO2 emissions. Distance based method emissions were calculated using by multiplying the estimated distance travelled with the fuel quantity transferred and then by the corresponding emission factor for the method of travel. Spend-based method emissions were calculated according to an environmental economic input-output methodology using the following steps: 1) Expenditures for Transportation and Distribution of goods incoming to Vermilion and between Vermilion operations were identified from primary financial accounting data; 2) Emission factors, for transportation methods, in units of tCO2e/\$ were formulated from WIOD national input output tables; 3) GHG emissions were calculated for each transportation method by multiplying expenditure totals with the relevant emission factors, followed by the summation of emissions for all transportation methods.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

Emissions were calculated based on Vermilion's internal source information.

**Waste generated in operations**

---

**Evaluation status**

Not relevant, calculated

**Metric tonnes CO2e**

17,904

**Emissions calculation methodology**

Scope 3 emissions from Waste Generated in Operations were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol"). Total GHG emissions are exclusive of any biogenic CO2 emissions. An "Operational Control" approach as described in the Protocol was employed for the consolidation of waste tonnages for each relevant ASPECT / Indicator name as described by G4-EN23. Emissions were calculated according to established waste GHG quantification models including IPCC Emissions from Waste Incineration and LandGem EPA model. An EPA drilling mud degassing emission factor was used to calculate offgas from drilling muds.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

**Business travel**

---

**Evaluation status**

Not relevant, calculated

**Metric tonnes CO2e**

9,359

**Emissions calculation methodology**

GHG emissions from business travel were calculated following the WRI/WBCSD's GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ('Protocol' hereafter). Total GHG emissions are reported in metric tons of CO2 equivalent, excluding biogenic CO2 emissions and independent of any GHG trades. This section employed the 'Operational Control' approach for consolidation as described in the Protocol. For reimbursement of private vehicle use, actual mile traveled were utilized, which is then converted to GHG emissions using US EPA's or EU emissions factors of passenger cars, depending on location of travel. For air travel, route and class specific information was utilized globally.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

**Employee commuting**

---

**Evaluation status**

Not relevant, calculated

**Metric tonnes CO2e**

1,020

**Emissions calculation methodology**

Scope 3 emissions related to Employee Commuting were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol"). Total GHG emissions are exclusive of any biogenic CO2 emissions. Emissions were calculated using the Quantis Scope 3 Evaluator.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

**Upstream leased assets**

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**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion is using the Operational Control boundary and following this approach all emissions from leased assets are incorporated into Scope 1 and Scope 2.

**Downstream transportation and distribution**

---

**Evaluation status**

Not relevant, calculated

**Metric tonnes CO<sub>2</sub>e**

87,780

**Emissions calculation methodology**

Scope 3 emissions related to Downstream Transportation and Distribution were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Protocol") distance-based method, and a spend-based method. Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. Distance based method emissions were calculated using by multiplying the estimated distance traveled with the fuel quantity transferred and then by the corresponding emission factor for the method of travel, followed by the summation of emissions for all transportation methods.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

This category accounts for less than 1% of Vermilion's total Scope 3 and is therefore considered to be not relevant.

**Processing of sold products**

---

**Evaluation status**

Relevant, calculated

**Metric tonnes CO<sub>2</sub>e**

674,098

**Emissions calculation methodology**

Scope 3 emissions related to Processing of Sold Products were identified following the WRI/WBCSD GHG Protocol: Corporate Value Chain (Scope 3) Accounting and

Reporting Standard ("Protocol") and customized for oil and gas. Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. All activity within the organizational boundary is included. Activity data is net production. Emissions for oil refining were calculated using the Production Method: Tier 1, according to the following steps: 1) Calculate an average oil refinery emission factor for the type of oil Vermilion produces. Data to calculate this emission factor was obtained from "Oil Climate Index - Know Your Oil" publication. 2) GHG emissions were calculated by multiplying crude volume totals with the refining emission factor. Global warming potentials from the 5th IPCC Assessment report were used for the calculations. Product volumes are obtained from Vermilion's annual report. Emissions for natural gas and natural gas liquids processing were calculated using emission factors obtained from the US EPA and Vermilion's annual production. Emission factors for crude oil consumption were built from National Inventory Reports submitted to the United Nations.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

Emissions were calculated based on Vermilion's internal source information.

**Use of sold products**

---

**Evaluation status**

Relevant, calculated

**Metric tonnes CO<sub>2</sub>e**

12,937,168

**Emissions calculation methodology**

Scope 3 emissions related to Use of Sold Products were identified and calculated following the CDP "Guidance for companies reporting on climate change on behalf of investors & supply chain members 2016". Total GHG emissions are exclusive of any biogenic CO<sub>2</sub> emissions. Emissions were calculated according to the following steps: 1) Total annual production volumes were obtained; 2) Fuel combustion emission factors were calculated for each fuel type and production region; 3) GHG emissions were calculated by multiplying production volumes with the relevant fuel combustion emission factor; 4) Emissions from each region were summed to give the total emissions. Global warming potentials from the 4th IPCC Assessment report were used for the calculations.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

Emissions were calculated based on Vermilion's internal source information.

**End of life treatment of sold products**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion products sold do not generate any end of life GHG emissions because they are consumed as a primary source of energy or as a feedstock for other processes. Vermilion does not have any information on the fate of its products once they are sold. Since the majority of Vermilion's products are energy based, it is anticipated that there will not be any End of Life emissions.

**Downstream leased assets**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion does not lease any assets according to the definitions for this category.

**Franchises**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion does not operate as a Franchisor, therefore, this section is not relevant for Scope 3 emissions.

**Investments**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Based on the Protocol and a quick analysis of values, the GHG emissions associated with investments would be minor and not material compared to the emissions from product use or transportation.

**Other (upstream)**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion has not identified any "Other" Scope 3 sources of emissions therefore this category is not relevant.

**Other (downstream)**

---

**Evaluation status**

Not relevant, explanation provided

**Please explain**

Vermilion has not identified any "Other" Scope 3 sources of emissions therefore this category is not relevant.

## C6.7

**(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?**

No

## C6.10

**(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO<sub>2</sub>e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

---

**Intensity figure**

0.0005

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)**

1,147,167

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

2,325,653,000

**Scope 2 figure used**

Market-based

**% change from previous year**

16.67

**Direction of change**

Decreased

**Reason for change**

The year-over-year decrease in emission intensity in this category is principally related to emissions reduction activities undertaken in 2019 in relation to the Spartan energy assets acquired by Vermilion in 2018. As described in Section 4 (Targets and Performance), on an annualized basis, flaring and venting emissions from the former Spartan assets were reduced by approximately 99,971 tCO<sub>2</sub>e in 2019 (374,516 - 274,545 = 99,971 tCO<sub>2</sub>e) .

The 2019 intensity figure represents a 16.67 % reduction in relation to the



corresponding 2018 intensity value  $((0.0006-0.0005)/0.0006 = 16.67\%$  or  $0.0005/0.0006 = 16.67\%$  reduction). It is expected that as infrastructure and operational improvements related to these assets continue, the associated emission intensities will continue to decline and ultimately align with Vermilion's historical production metrics.

Organizationally, emissions reduction activities that were initiated or fully implemented in 2019, and associated annual emissions reduction estimates include, but aren't limited to: the construction of new or retrofitted facility infrastructure (88,600 tCO<sub>2</sub>e/year), installation of new or expanded gathering systems to bring additional gas to market (41,000 tCO<sub>2</sub>e/year), installation of vapour recovery units (VRUs) to eliminate flaring and venting (11,400 tCO<sub>2</sub>e/year), and shutting-in uneconomical assets (4,550 tCO<sub>2</sub>e/year). Regulatory compliance related equipment retrofits completed within the Canadian Business Unit in 2019 are expected to result in a further 40,600 tCO<sub>2</sub>e/year emissions reduction.

**Intensity figure**

0.03134

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)**

1,147,167

**Metric denominator**

barrel of oil equivalent (BOE)

**Metric denominator: Unit total**

36,604,811

**Scope 2 figure used**

Market-based

**% change from previous year**

1.54

**Direction of change**

Decreased

**Reason for change**

The year-over-year decrease in emission intensity in this category is principally related to the emissions reduction activities undertaken in 2019 in relation to the Spartan Energy assets acquired by Vermilion in 2018. As described in Section 4 (Targets and Performance), on an annualized basis, flaring and venting (Scope 1) emissions from the former Spartan assets were reduced by approximately 99,971 tCO<sub>2</sub>e in 2019  $(374,516 - 274,545 = 99,971 \text{ tCO}_2\text{e})$ .

The 2019 intensity figure represents a 1.54 % reduction in relation to the corresponding 2018 intensity value  $((0.03183-0.03134)/0.03183 = 1.54\%$  or  $0.03134/0.03183 = 1.54\%$

reduction). It is expected that the emissions intensity in this category will continue to improve in response to the ongoing infrastructure and operational improvements related to these assets.

## C-OG6.12

**(C-OG6.12) Provide the intensity figures for Scope 1 emissions (metric tons CO<sub>2</sub>e) per unit of hydrocarbon category.**

---

### Unit of hydrocarbon category (denominator)

Thousand barrels of crude oil/ condensate

### Metric tons CO<sub>2</sub>e from hydrocarbon category per unit specified

25.56

### % change from previous year

6

### Direction of change

Decreased

### Reason for change

The year-over-year decrease in emission intensity in this category is principally related to emissions reduction activities undertaken in 2019 in relation to the Spartan energy assets acquired by Vermilion in 2018. As described in Section 4 (Targets and Performance), on an annualized basis, flaring and venting emissions from the former Spartan assets were reduced by approximately 99,971 tCO<sub>2</sub>e in 2019 (374,516 - 274,545 = 99,971 tCO<sub>2</sub>e). It is expected that as infrastructure and operational improvements related to these assets continue, the associated emission intensities will continue to decline and ultimately align with Vermilion's historical production metrics.

Organizationally, emissions reduction activities that were initiated or fully implemented in 2019, and associated annual emissions reduction estimates include, but aren't limited to: the construction of new or retrofitted facility infrastructure (88,600 tCO<sub>2</sub>e/year), installation of new or expanded gathering systems to bring additional gas to market (41,000 tCO<sub>2</sub>e/year), installation of vapour recovery units (VRUs) to eliminate flaring and venting (11,400 tCO<sub>2</sub>e/year), and shutting-in uneconomical assets (4,550 tCO<sub>2</sub>e/year). Regulatory compliance related equipment retrofits completed within the Canadian Business Unit in 2019 are expected to result in a further 40,600 tCO<sub>2</sub>e/year emissions reduction.

### Comment

---

### Unit of hydrocarbon category (denominator)

Million cubic feet of natural gas

**Metric tons CO<sub>2</sub>e from hydrocarbon category per unit specified**

3.44

**% change from previous year**

12

**Direction of change**

Decreased

**Reason for change**

The year-over-year decrease in emission intensity in this category is principally related to emissions reduction activities undertaken in 2019 in relation to the Spartan energy assets acquired by Vermilion in 2018. As described in Section 4 (Targets and Performance), on an annualized basis, flaring and venting emissions from the former Spartan assets were reduced by approximately 99,971 tCO<sub>2</sub>e in 2019 (374,516 - 274,545 = 99,971 tCO<sub>2</sub>e) . It is expected that as infrastructure and operational improvements related to these assets continue, the associated emission intensities will continue to decline and ultimately align with Vermilion's historical production metrics.

Organizationally, emissions reduction activities that were initiated or fully implemented in 2019, and associated annual emissions reduction estimates include, but aren't limited to: the construction of new or retrofitted facility infrastructure (88,600 tCO<sub>2</sub>e/year), installation of new or expanded gathering systems to bring additional gas to market (41,000 tCO<sub>2</sub>e/year), installation of vapour recovery units (VRUs) to eliminate flaring and venting (11,400 tCO<sub>2</sub>e/year), and shutting-in uneconomical assets (4,550 tCO<sub>2</sub>e/year). Regulatory compliance related equipment retrofits completed within the Canadian Business Unit in 2019 are expected to result in a further 40,600 tCO<sub>2</sub>e/year emissions reduction.

**Comment**

---

**Unit of hydrocarbon category (denominator)**

Thousand barrels of natural gas liquids

**Metric tons CO<sub>2</sub>e from hydrocarbon category per unit specified**

26.5

**% change from previous year**

12

**Direction of change**

Decreased

**Reason for change**

The year-over-year decrease in emission intensity in this category is principally related to emissions reduction activities undertaken in 2019 in relation to the Spartan energy assets acquired by Vermilion in 2018. As described in Section 4 (Targets and Performance), on an annualized basis, flaring and venting emissions from the former Spartan assets were reduced by approximately 99,971 tCO<sub>2</sub>e in 2019 (374,516 - 274,545 = 99,971 tCO<sub>2</sub>e) . It is expected that as infrastructure and operational improvements related to these assets continue, the associated emission intensities will continue to decline and ultimately align with Vermilion's historical production metrics.

Organizationally, emissions reduction activities that were initiated or fully implemented in 2019, and associated annual emissions reduction estimates include, but aren't limited to: the construction of new or retrofitted facility infrastructure (88,600 tCO<sub>2</sub>e/year), installation of new or expanded gathering systems to bring additional gas to market (41,000 tCO<sub>2</sub>e/year), installation of vapour recovery units (VRUs) to eliminate flaring and venting (11,400 tCO<sub>2</sub>e/year), and shutting-in uneconomical assets (4,550 tCO<sub>2</sub>e/year). Regulatory compliance related equipment retrofits completed within the Canadian Business Unit in 2019 are expected to result in a further 40,600 tCO<sub>2</sub>e/year emissions reduction.

#### Comment

### C-OG6.13

**(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.**

---

#### Oil and gas business division

Upstream

**Estimated total methane emitted expressed as % of natural gas production or throughput at given division**

0.32

**Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division**

0.16

#### Comment

According to a 2016 Environmental Defense Fund report (Improving Methane Disclosure in the Oil and Gas Industry), scientific studies on methane emissions from the natural gas and oil industries suggest that in order to maximize the climate benefits of a transition from both diesel and coal to natural gas on all time scales, methane emissions from the industry must be limited to an emissions rate of 0.8%. Vermilion's emission ratio of CH<sub>4</sub> to natural gas production is significantly lower than the EDF's recommendations at 0.32% (on a v/v basis). When comparing CH<sub>4</sub> emitted to total

hydrocarbon production within our emissions reporting scope (on a BTU basis), Vermilion's ratio is 0.16% (compared on a BTU basis). We feel that both of these values are a testament to our commitment to methane detection and reduction, and we continue to examine areas where we can improve.

## C7. Emissions breakdowns

### C7.1

**(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?**

Yes

#### C7.1a

**(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).**

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	555,516	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	302,197	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	1,109	IPCC Fourth Assessment Report (AR4 - 100 year)

#### C-OG7.1b

**(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.**

**Emissions category**

Fugitives

**Value chain**

Upstream

**Product**

Oil

**Gross Scope 1 CO2 emissions (metric tons CO2)**

775.4

**Gross Scope 1 methane emissions (metric tons CH4)**

3,160.1

**Total gross Scope 1 emissions (metric tons CO<sub>2</sub>e)**

79,777.2

**Comment**

Vermilion quantifies venting and flaring in both the oil and natural gas value chains separately. These values are not aggregated in the total for the category, as per the reporting guidance.

---

**Emissions category**

Venting

**Value chain**

Upstream

**Product**

Oil

**Gross Scope 1 CO<sub>2</sub> emissions (metric tons CO<sub>2</sub>)**

25,685.2

**Gross Scope 1 methane emissions (metric tons CH<sub>4</sub>)**

2,457.8

**Total gross Scope 1 emissions (metric tons CO<sub>2</sub>e)**

87,130.1

**Comment**

---

**Emissions category**

Flaring

**Value chain**

Upstream

**Product**

Oil

**Gross Scope 1 CO<sub>2</sub> emissions (metric tons CO<sub>2</sub>)**

129,467.2

**Gross Scope 1 methane emissions (metric tons CH<sub>4</sub>)**

333.6

**Total gross Scope 1 emissions (metric tons CO<sub>2</sub>e)**

137,807.4

## Comment

---

### Emissions category

Fugitives

### Value chain

Upstream

### Product

Gas

### Gross Scope 1 CO2 emissions (metric tons CO2)

1,617.5

### Gross Scope 1 methane emissions (metric tons CH4)

2,952

### Total gross Scope 1 emissions (metric tons CO2e)

75,416.7

### Comment

Vermilion quantifies venting and flaring in both the oil and natural gas value chains separately. These values are not aggregated in the total for the category, as per the reporting guidance.

---

### Emissions category

Venting

### Value chain

Upstream

### Product

Gas

### Gross Scope 1 CO2 emissions (metric tons CO2)

22,112.1

### Gross Scope 1 methane emissions (metric tons CH4)

2,514.9

### Total gross Scope 1 emissions (metric tons CO2e)

84,984.4

### Comment

---

**Emissions category**

Flaring

**Value chain**

Upstream

**Product**

Gas

**Gross Scope 1 CO2 emissions (metric tons CO2)**

79,506.7

**Gross Scope 1 methane emissions (metric tons CH4)**

252.9

**Total gross Scope 1 emissions (metric tons CO2e)**

85,829.7

**Comment**

---

**Emissions category**

Combustion (excluding flaring)

**Value chain**

Upstream

**Product**

Oil

**Gross Scope 1 CO2 emissions (metric tons CO2)**

137,015.4

**Gross Scope 1 methane emissions (metric tons CH4)**

3

**Total gross Scope 1 emissions (metric tons CO2e)**

137,089.8

**Comment**

---

**Emissions category**

Combustion (excluding flaring)

**Value chain**



Upstream

**Product**

Gas

**Gross Scope 1 CO2 emissions (metric tons CO2)**

154,765.1

**Gross Scope 1 methane emissions (metric tons CH4)**

7.1

**Total gross Scope 1 emissions (metric tons CO2e)**

154,941.6

**Comment**

**Emissions category**

Process (feedstock) emissions

**Value chain**

Upstream

**Product**

Unable to disaggregate

**Gross Scope 1 CO2 emissions (metric tons CO2)**

5,680.7

**Gross Scope 1 methane emissions (metric tons CH4)**

406.6

**Total gross Scope 1 emissions (metric tons CO2e)**

15,845.5

**Comment**

## C7.2

**(C7.2) Break down your total gross global Scope 1 emissions by country/region.**

Country/Region	Scope 1 emissions (metric tons CO2e)
Canada	633,460
France	73,465
Netherlands	15,427
Australia	60,693

United States of America	19,406
Germany	11,562
Ireland	42,299
Hungary	2,510

## C7.3

**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

By activity

### C7.3c

**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO2e)
Production of Natural Gas	334,693
Production of Light & Medium Oil	446,023.1
Production of Natural Gas Liquids	78,106.3

## C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

**(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.**

	Gross Scope 1 emissions, metric tons CO2e	Comment
Oil and gas production activities (upstream)	858,822.3	Vermilion is an upstream oil and gas producer. 100% of our Scope 1 emissions are attributed to our upstream activities.
Oil and gas production activities (midstream)	0	Vermilion is an upstream oil and gas producer. 0% of our Scope 1 emissions are attributed to midstream activities.
Oil and gas production activities (downstream)	0	Vermilion is an upstream oil and gas producer. 0% of our Scope 1 emissions are attributed to downstream activities.

## C7.5

**(C7.5) Break down your total gross global Scope 2 emissions by country/region.**

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Canada	269,349	0	375,607.19	0
France	0	6,808	188,789	0
Netherlands	0	0	95,253.77	95,253.77
Australia	114	0	163.05	0
United States of America	10,231	0	8,556.27	0
Germany	0	1,575	3,220.08	0
Ireland	268	0	788.26	0
Hungary	0	0	0	0

## C7.6

**(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.**

By activity

### C7.6c

**(C7.6c) Break down your total gross global Scope 2 emissions by business activity.**

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Purchased electricity	279,961.9	8,382.8

## C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

**(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.**

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
--	---	---	---------

Oil and gas production activities (upstream)	279,961.9	8,382.8	All of Vermilion's Scope 2 activities are considered to be associated with the upstream production of oil and gas.
Oil and gas production activities (midstream)	0	0	Vermilion does not have activities that fall within the midstream oil and gas production category.
Oil and gas production activities (downstream)	0	0	Vermilion does not have activities that fall within the downstream oil and gas production category.

## C7.9

**(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?**

Decreased

### C7.9a

**(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	This category did not materially impact our operations in 2019.
Other emissions reduction activities	141,477	Decreased	15.44	Although the acquisitions undertaken in 2018, particularly in our Canadian business unit, have necessarily resulted in a year-over-year increase in our Scope 1 and 2 emissions, our emission reduction activities and operational structure which maximizes production while reducing emissions intensity means that our emissions have not grown as would have otherwise been expected based on the added production. As described in Section 4

				(Targets & Performance), our ongoing emission reduction initiatives related to Elkhorn (acquired in 2014) and the newly implemented initiatives related Spartan (acquired in 2018) have resulted in 2019 emission reductions of approximately 11,923 tCO <sub>2</sub> e and 99,971 tCO <sub>2</sub> e, respectively. Emissions reductions activities implemented or initiated in 2019 included, the construction of new or retrofitted infrastructure to reduce flaring and venting emissions, installation of expanded gathering systems to bring additional gas to market, and shutting-in uneconomical assets. The combined total of the 2019 emission reduction initiatives (141,477 tCO <sub>2</sub> e) represents an approximately 15% reduction in CO <sub>2</sub> e emissions in relation to the quantified 2018 Scope 1 and Scope 2 total (141,477/916,022) = 15.4% reduction).
Divestment	0	No change	0	This category did not materially impact our operations in 2019.
Acquisitions	302,132.3	Increased	32.98	In 2018, Vermilion completed structural acquisitions in our Canada (Spartan Energy) and the US (Hilight) business units. The incremental Scope 1 and 2 emissions related to the full 2019 calendar year operatorship of these acquisitions (302,132 tCO <sub>2</sub> e) represents a 33% increase in relation to our 2018 emission total (302,132/916,022 = 33% increase). The emission contribution of the Spartan assets (290,091 tCO <sub>2</sub> e) represents the majority of the increase.
Mergers	0	No change	0	This category did not materially impact our operations in 2019.
Change in output	30,451.9	Increased	3.32	Vermilion's organic production growth in 2019 (2,621 BOE/d) represented approximately 12% of the total year-over-year production change (2,621 / 21,523 = 12.2%). Applying the 2018 per BOE CO <sub>2</sub> e intensity (0.03183) to this growth represents a corresponding

				Scope 1 and 2 emission increase of 30,452 tonnes, or 3.3% of the quantified 2018 Scope 1 and 2 total (30,452/916,022) = 3.3%).
Change in methodology	0	No change	0	This category did not materially impact our operations in 2019.
Change in boundary	40,037.6	Increased	4.37	In November 2018, Vermilion assumed operational control of the Corrib gas field in Ireland and increased its working interest in the project from 18.5% to 20%. The incremental Scope 1 and 2 emissions related to the full 2019 calendar operatorship of the Corrib field (40,038 tCO <sub>2</sub> e) represents a 4.4% increase in relation to our 2018 emission total (40,038/916,022 = 4.4%).
Change in physical operating conditions	0	No change	0	This category did not materially impact our operations in 2019.
Unidentified	0	No change	0	This category did not materially impact our operations in 2019.
Other	0	No change	0	This category did not materially impact our operations in 2019.

## C7.9b

**(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?**

Market-based

## C8. Energy

### C8.1

**(C8.1) What percentage of your total operational spend in the reporting year was on energy?**

More than 20% but less than or equal to 25%

### C8.2

**(C8.2) Select which energy-related activities your organization has undertaken.**

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

## C8.2a

**(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.**

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	1,543,005.68	1,543,005.68
Consumption of purchased or acquired electricity		95,253.77	577,123.85	672,377.63
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		95,253.77	2,120,129.53	2,215,383.3

## C8.2b

**(C8.2b) Select the applications of your organization's consumption of fuel.**

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes

Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

## C8.2c

**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

### Fuels (excluding feedstocks)

Natural Gas

### Heating value

HHV (higher heating value)

### Total fuel MWh consumed by the organization

1,359,464.47

### MWh fuel consumed for self-generation of electricity

475,812.56

### MWh fuel consumed for self-generation of heat

883,651.91

### Emission factor

0.0022

### Unit

metric tons CO<sub>2</sub>e per m<sup>3</sup>

### Emissions factor source

Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry

### Comment

For fuel emission quantification, Vermilion utilizes a mass balance approach factoring in location-specific gas analyses. The value provided is a gross average of total emissions associated with natural gas as compared to natural gas consumption.

### Fuels (excluding feedstocks)



Diesel

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

173,308.44

**MWh fuel consumed for self-generation of electricity**

129,981.33

**MWh fuel consumed for self-generation of heat**

43,327.11

**Emission factor**

2.69

**Unit**

metric tons CO<sub>2</sub>e per m<sup>3</sup>

**Emissions factor source**

Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry

**Comment**

For fuel emission quantification, Vermilion utilizes a mass balance approach factoring in the fuel density and carbon weight percent. The value provided is a gross average of total emissions associated with diesel as compared to total diesel consumption.

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**Fuels (excluding feedstocks)**

Propane Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

10,232.76

**MWh fuel consumed for self-generation of electricity**

10,232.76

**MWh fuel consumed for self-generation of heat**

0

**Emission factor**

1.51

**Unit**

metric tons CO<sub>2</sub>e per m<sup>3</sup>

**Emissions factor source**

Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry

**Comment**

For fuel emission quantification, Vermilion utilizes a mass balance approach factoring in the fuel density and carbon weight percent. The value provided is a gross average of total emissions associated with propane as compared to total propane consumption.

**C8.2d**

**(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	226,535.07	226,535.07	0	0
Heat	920,931.75	920,931.75	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

**C8.2e**

**(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.**

**Sourcing method**

Unbundled energy attribute certificates, Renewable Energy Certificates (RECs)

**Low-carbon technology type**

Hydropower

**Country/region of consumption of low-carbon electricity, heat, steam or cooling**

Netherlands

**MWh consumed accounted for at a zero emission factor**

95,253.77

**Comment**

Vermilion maintains purchase contracts in relation to the power we purchase. In the Netherlands, we have utilized contractual agreements to ensure certified renewable

energy for a total of 108,000 MWh delivered to our organization. The power production is certified in accordance with the International EECS Standard and is documented by issuance of an electronic Guarantee of Origin.

## C9. Additional metrics

### C9.1

**(C9.1) Provide any additional climate-related metrics relevant to your business.**

#### C-OG9.2a

**(C-OG9.2a) Disclose your net liquid and gas hydrocarbon production (total of subsidiaries and equity-accounted entities).**

	In-year net production	Comment
Crude oil and condensate, million barrels	17.48	Total production of crude oil and condensate as reported in our 2019 annual report. For complete consolidated results, we encourage investors to review our financial reporting.
Natural gas liquids, million barrels	2.91	Total production of NGLs as reported in our 2019 annual report. For complete consolidated results, we encourage investors to review our financial reporting.
Oil sands, million barrels (includes bitumen and synthetic crude)	0	Vermilion does not have bitumen or synthetic crude assets.
Natural gas, billion cubic feet	97.39	Total production of natural gas as reported in our 2019 annual report. For complete consolidated results, we encourage investors to review our financial reporting.

#### C-OG9.2b

**(C-OG9.2b) Explain which listing requirements or other methodologies you use to report reserves data. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries, please explain this.**

Estimated proved and proved plus probable reserves attributable to the assets as evaluated by GLJ Petroleum Consultants Ltd. in a report dated February 10, 2019 with an effective date of December 31, 2019. Reserves for Australia, Canada, Croatia, France, Germany, Hungary, Ireland, Netherlands, and United States are established using deterministic methodology. Total proved reserves are established at the 90 percent probability (P90) level. There is a 90 percent probability that the actual reserves recovered will be equal to or greater than the P90 reserves. Total proved plus probable reserves are established at the 50 percent probability (P50) level. There is a 50 percent probability that the actual reserves recovered will be equal to or greater

than the P50 reserves. The net total resource base includes the 2P reserves and a risked best estimate of the contingent and prospective resources.

### C-OG9.2c

**(C-OG9.2c) Disclose your estimated total net reserves and resource base (million boe), including the total associated with subsidiaries and equity-accounted entities.**

	Estimated total net proved + probable reserves (2P) (million BOE)	Estimated total net proved + probable + possible reserves (3P) (million BOE)	Estimated net total resource base (million BOE)	Comment
Row 1	501.2	0	954.8	Reserves are total company interest reserves, as reported in our Annual Information Form. Please note, that Vermilion does not report 3P reserves. The net total resources base is the total of the 2P reserves and risked best estimate of the contingent and prospective resources. For complete consolidated results, we encourage investors to review our financial reporting.

### C-OG9.2d

**(C-OG9.2d) Provide an indicative percentage split for 2P, 3P reserves, and total resource base by hydrocarbon categories.**

	Net proved + probable reserves (2P) (%)	Net proved + probable + possible reserves (3P) (%)	Net total resource base (%)	Comment
Crude oil/ condensate/ natural gas liquids	65	0	57	Reserves are total company interest reserves, as reported in our Annual Information Form. Please note, that Vermilion does not report 3P reserves. The net total resources base is the total of the 2P reserves and risked best estimate of the contingent and prospective resources. For complete consolidated

				results, we encourage investors to review our financial reporting.
Natural gas	35	0	43	Reserves are total company interest reserves, as reported in our Annual Information Form. Please note, that Vermilion does not report 3P reserves. The net total resources base is the total of the 2P reserves and risked best estimate of the contingent and prospective resources.  For complete consolidated results, we encourage investors to review our financial reporting.
Oil sands (includes bitumen and synthetic crude)	0	0	0	Vermilion does not have bitumen or synthetic crude assets.

## C-OG9.2e

(C-OG9.2e) Provide an indicative percentage split for production, 1P, 2P, 3P reserves, and total resource base by development types.

### Development type

Onshore

### In-year net production (%)

87

### Net proved reserves (1P) (%)

93

### Net proved + probable reserves (2P) (%)

93

### Net proved + probable + possible reserves (3P) (%)

0

### Net total resource base (%)

96

### Comment

Reserves are total company interest reserves, as reported in our Annual Information Form. Vermilion has shallow water and deep water assets in our Australia and Ireland business units, respectively. Please note, that Vermilion does not report 3P reserves. For complete consolidated results, we encourage investors to review our financial reporting.

---

**Development type**

Shallow-water

**In-year net production (%)**

6

**Net proved reserves (1P) (%)**

3

**Net proved + probable reserves (2P) (%)**

3

**Net proved + probable + possible reserves (3P) (%)**

0

**Net total resource base (%)**

2

**Comment**

Reserves are total company interest reserves, as reported in our Annual Information Form. Vermilion has shallow water and deep water assets in our Australia and Ireland business units, respectively. Please note, that Vermilion does not report 3P reserves. For complete consolidated results, we encourage investors to review our financial reporting.

---

**Development type**

Deepwater

**In-year net production (%)**

8

**Net proved reserves (1P) (%)**

4

**Net proved + probable reserves (2P) (%)**

4

**Net proved + probable + possible reserves (3P) (%)**

0

**Net total resource base (%)**

2

**Comment**

Reserves are total company interest reserves, as reported in our Annual Information Form. Vermilion has shallow water and deep water assets in our Australia and Ireland business units, respectively. Please note, that Vermilion does not report 3P reserves. For complete consolidated results, we encourage investors to review our financial reporting.

**C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6**

**(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?**

	Investment in low-carbon R&D	Comment
Row 1	Yes	<p>Current low emission R&amp;D activities focus on:</p> <ol style="list-style-type: none"> <li>1) Developing geothermal energy projects that leverage the heat contained in our produced water (France). Vermilion's petroleum extraction process produces a mix of oil, gas and water which is naturally heated to around 60°C. Once the oil and gas are separated out, the heated water enters a closed-loop system where heat exchangers transfer its caloric energy to a second water system belonging to our partners (while ensuring the two water systems never come into contact). Vermilion reuses the produced water by pumping it back underground to maintain reservoir pressures and enhance production. By demonstrating proof-of-concept, our partnership with tomato growers Tom d'Aqui in Parentis has been credited as being a catalyst for three new projects launched independently of Vermilion.</li> <li>2) Developing biogas initiatives that feed biogas into existing pipeline gathering systems (Netherlands)</li> <li>3) Our first use of an ORC turbine, in which a turbogenerator works as a steam turbine to transform thermal energy into mechanical energy (France).</li> <li>4) Participation in Avenia, a multi-sector association in France with many programs related to supporting geothermal development and optimizing recovery from existing hydrocarbon reservoirs. We supported (with funding, expertise and marketing) an industry and country-wide study to identify the potential for waste energy use from oil and gas operations.</li> <li>5) Participation in the Geothermal Forum provides a platform for the</li> </ol>

		<p>exchange and preparation of information for the geothermal industry</p> <p>6) Our non-operating partnership in the Weyburn-Midale Carbon Capture and Storage facility in Saskatchewan, Canada, which is one of the largest carbon capture, utilization and storage projects in the world. Our non-operated production from this enhanced oil recovery project totals approximately 290,668 tonnes CO<sub>2</sub>e/year (2,321 bbls/d). The investment figure represents 100% of the current forecast expenditure associated with R&amp;D of renewable energy generation at this time.</p>
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### C-CO9.6a/C-EU9.6a/C-OG9.6a

**(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.**

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Renewable energy	Applied research and development	21-40%	213,000	Vermilion is an active participant on the H2020 MEET project whose objective is to demonstrate the geothermal potential of Europe in different geological settings to ensure replicability of solutions and to attract investors in agreement with our ESG roadmap. The applied research and development part of this project consists of mapping thermal resource from oil facilities, searching and mapping end users with heat demand, de-risking (thermal modeling, corrosion and scaling study), and testing Rankin thermodynamic cycles for electricity production at low temperature.

### C-OG9.7

**(C-OG9.7) Disclose the breakeven price (US\$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.**

19.23



## C10. Verification

### C10.1

**(C10.1) Indicate the verification/assurance status that applies to your reported emissions.**

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

### C10.1a

**(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.**

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/ section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

### C10.1b

**(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.**

**Scope 2 approach**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/ section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 2 approach**

Scope 2 market-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/ section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

## C10.1c

**(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.**

---

**Scope 3 category**

Scope 3: Purchased goods and services

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Capital goods

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Upstream transportation and distribution

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Waste generated in operations

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Business travel

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Employee commuting

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Downstream transportation and distribution

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Processing of sold products

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Use of sold products

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3 (upstream & downstream)

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**



Scope 3: Upstream leased assets

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Investments

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: End-of-life treatment of sold products

**Verification or assurance cycle in place**

Annual process


**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

Scope 3: Downstream leased assets

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

**Scope 3 category**

Scope 3: Franchises

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 02\_CDP-VerificationLetter2019\_R02.pdf

**Page/section reference**

Page 1 - 2

**Relevant standard**

ISO14064-3

**Proportion of reported emissions verified (%)**

100

**C10.2**

**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

Yes

**C10.2a**

**(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?**

 02\_CDP-VerificationLetter2019\_R02.pdf

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Year on year change in emissions	Both 2018 and 2019 verifications	To maintain consistency, Vermilion maintains our verification year-over-year. For 2018 and 2019 information, this included the same

	(Scope 1 and 2)	were completed to ISO 14064-3.	verification team, support of the verification data, and changes in emissions year-over-year. See attached verification statement.
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## C11. Carbon pricing

### C11.1

**(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

Yes

#### C11.1a

**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

Canada federal fuel charge

EU ETS

Ireland carbon tax

#### C11.1b

**(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.**

##### EU ETS

**% of Scope 1 emissions covered by the ETS**

4.9

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1, 2019

**Period end date**

December 31, 2019

**Allowances allocated**

32,910

**Allowances purchased**

8,680

**Verified Scope 1 emissions in metric tons CO<sub>2</sub>e**

42,299

**Verified Scope 2 emissions in metric tons CO<sub>2</sub>e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Vermilion's Ireland BU is subject to the EU ETS.

## C11.1c

**(C11.1c) Complete the following table for each of the tax systems you are regulated by.**

### Canada federal fuel charge

---

**Period start date**

April 1, 2019

**Period end date**

December 31, 2019

**% of total Scope 1 emissions covered by tax**

21.8

**Total cost of tax paid**

1,929,000

**Comment**

Vermilion's Saskatchewan operations were subject to the Federal Fuel Charge commencing April 1, 2019. Vermilion has subsequently opted-in to both the Saskatchewan OBPS and Alberta TIER systems.

### Ireland carbon tax

---

**Period start date**

January 1, 2020

**Period end date**

December 31, 2019

**% of total Scope 1 emissions covered by tax**

4.9

**Total cost of tax paid**

165,878.42

**Comment**

Vermilion's IBU operations were subject to the Ireland carbon tax.

## C11.1d

### **(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?**

In April 2019, Vermilion's Canadian operations in Saskatchewan and Manitoba became subject to the federal Greenhouse Gas Pollution Pricing Act (GGPPA). Carbon tax rates under the GGPPA were set at \$20 per tonne of CO<sub>2</sub>e in 2019 and escalate to \$50 per tonne of CO<sub>2</sub>e in 2022. The economy wide carbon tax that took effect in Alberta in 2017 was repealed in May 2019 and, as a result, the Canadian federal government announced in June 2019 that the fuel charge element of the GGPPA will apply in Alberta starting January 1, 2020. In December, 2019, the Canadian government announced that Alberta's newly created Technology Innovation and Emissions Reduction (TIER) regulation met the federal stringency requirements for the emission sources covered. As such, the federal fuel charge will apply in Alberta in 2020 but not the federal output-based pricing system (OBPS). Similar to the federal OBPS, the Alberta TIER system will apply a tax rate of \$30 per tonne of CO<sub>2</sub>e commencing January 1, 2020. Vermilion has opted-in to the Alberta TIER program and to the Saskatchewan Carbon Tax OBPS which directly interacts with the Federal GGPPA.

Our strategy for complying with these emerging taxes includes the ongoing assessment and development of programs to reduce the utilization of fuel where possible, thereby limiting our financial exposure. An example of a program that has been assessed and implemented is the redesign of our production field hauling routes, resulting in a significant decrease in the distance travelled on an annual basis. This program not only reduced fuel costs and associated emissions, but also reduced the health and safety exposure associated with driving. In 2018 and 2019 Vermilion updated our internal carbon pricing framework and Global Carbon Liability Assessment Tool to reflect known and potential exposures to the cost of carbon on a low, probable and high cost basis. These cost scenarios support continued development and assessment of carbon cost specific risk cases for each of Vermilions operations.

We note that while some of the emissions reduction activities will have an impact on the amount of carbon tax liability in our operations, Vermilion proactively looks at ways to manage and reduce our emissions and the environmental impact of our operations, irrespective of the application of a specific tax.

## C11.2

### **(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**

No

## C11.3

### **(C11.3) Does your organization use an internal price on carbon?**

Yes

## C11.3a

**(C11.3a) Provide details of how your organization uses an internal price on carbon.**

---

### **Objective for implementing an internal carbon price**

Navigate GHG regulations  
Stakeholder expectations

### **GHG Scope**

Scope 1  
Scope 2

### **Application**

Our Carbon Liability Assessment Tool is a proactive tool intended to enable BUs and corporate groups to screen for the potential financial impact of carbon on our activities and capital investment. The structure that this tool applies to is broken out by Business Unit, which align with the countries and/or regions in which we have operated production. Below this level (depending on the regulatory regime), there is a further breakout to capture differences in carbon price scenarios (i.e. Alberta and Saskatchewan within our Canadian Business Unit).

### **Actual price(s) used (Currency /metric ton)**

30

### **Variance of price(s) used**

We have assessed the price of carbon on both a realized cost and shadow pricing basis, and have identified likely carbon pricing scenarios for all BUs where we have operational control (Low, Probable and High Cost scenarios). This work pertains primarily to Scope 1 (direct) emissions, but also contains the information to support assessment of Scope 2 and Scope 3 carbon cost impacts. The actual price listed is the probable cost scenario for Alberta. Vermilion has identified 46 cost scenarios (Low, probable and high) across our operating regions. Price scenarios are forward looking on a 5 year timeframe for all cost scenarios. Our assessment tool also factors in emissions by emission activity type, to ensure that application of regulatory boundaries related to the price of carbon are accurately assessed within each jurisdiction.

The example carbon cost reported in this row is the probable cost scenario (in CAD) for Alberta, Canada in the short to medium term. This scenario assumes the cost of compliance is equal to paying into Alberta's technology fund, and that the cost does not increase over time.

### **Type of internal carbon price**

Shadow price

### **Impact & implication**

In 2019, Vermilion completed a policy review and updated of our Carbon Liability framework. This framework directly feeds into our Carbon Liability Assessment Tool. This tool, along with the technical expertise of BU and Corporate personnel, support each of our BUs in determining the impact associated with the price of carbon. Change in GHG regulations and the impact associated with the cost of carbon is considered to be an ongoing risk. The implications of a change in GHG regulation, on an increased price of carbon basis, would be a decreased netback on a per BOE basis as a result of an increased operating expenditure associated with the increase in taxation. Actual impact (current) and potential impact (forecast) have been assessed against all carbon cost scenarios for our operating regions.

---

### **Objective for implementing an internal carbon price**

Navigate GHG regulations  
Stakeholder expectations

### **GHG Scope**

Scope 1  
Scope 2

### **Application**

Supporting our strategic objective of Integrated Sustainability, Vermilion recognizes and is committed to playing a role in the energy transition. Sustainability-oriented investors, governments and citizens will affect their greatest positive impact by turning to Best-in-Class operators like Vermilion during the transition. We align our work and measure our impact according to the United Nation's Global Goals for Sustainable Development (SDGs) and have been consistently been recognized for outstanding sustainability performance across a wide of independent organizations. When correlated to market performance, Vermilion sees a direct link to our market outperformance and our strong sustainability performance.

Vermilion's carbon pricing tools allow for that assessment of potential financial exposures under the various carbon regimes our operations fall under around the globe. This is an important component of our Operational Excellence and effective management or carbon price risk.

### **Actual price(s) used (Currency /metric ton)**

114

### **Variance of price(s) used**

Vermilions Carbon Liability Assessment Tool is used to support multiple objectives, including supporting stakeholder expectations regarding management of the financial impacts associated the price of carbon. The information used to support our risk based analysis of carbon pricing includes 46 cost scenarios across our operating regions (Low, probable and high).



The example carbon cost reported in this row is the probable cost scenario (Converted to CAD) for France in 2020. This scenario assumes TICPE is paused at €45 as a result of the "yellow vest protests" as of mid 2019. This scenario assumes that following the 'pause' the TICPE continues to be implemented in full as outlined in the Law on Energy Transition (reaching € 100 by 2030).

### **Type of internal carbon price**

Shadow price

### **Impact & implication**

Vermilion has identified likely carbon pricing scenarios for all of our operations. This work pertains to Scope 1 and 2, but is applicable to Scope 3 emissions as these emissions have the potential to be impacted by an economy wide carbon tax, such as the tax in Alberta, Canada. Carbon pricing is utilized by personnel with roles and responsibilities related to our strategic objective of Integrated Sustainability, as well as in Production Operations and Finance. The rationale for identifying potential carbon pricing (current and future) schemes is that they will have a direct financial impact to Vermilion and we have a duty to our investors to manage financial risk to ensure growth and return for our shareholders.

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### **Objective for implementing an internal carbon price**

Identify and seize low-carbon opportunities

### **GHG Scope**

Scope 1

Scope 2

Scope 3

### **Application**

New in 2017 and continuing into 2020, all capital projects at Vermilion are assessed for impact on various areas of sustainability, including emissions and impact on climate change. This supports all areas of our business understanding in how sustainability is integrated in the work, and the positive impacts from the capital projects we complete across our organization (over and above the production of our products).

### **Actual price(s) used (Currency /metric ton)**

105.7

### **Variance of price(s) used**

The carbon price utilized in the assessment of the impact of our projects, specific to the price of carbon, is dependent on the region and timeframe of the project. The flexibility of our Carbon Liability Assessment Tool supports the identification of climate related impacts of our capital investments in the short, medium and long term.

The example carbon cost reported in this row is the high cost scenario ((Converted to CAD) for Croatia out to 2021. This scenario assumes the that the factors associated

with the Berenberg ETS price projections for 2019-20 are extrapolated out to a trajectory that will reach a price of €80 by 2023.

### **Type of internal carbon price**

Shadow price

### **Impact & implication**

The process for determining carbon pricing includes a review of current pricing assertions by governments and a review of published research relating to the Paris Agreement and potential carbon price requirements. As this is a landscape that evolves and changes on a regular basis, in 2019 Vermilion completed an in-depth review of our Carbon Liability Policy Framework with the support of third party experts. Carbon pricing and emissions have a direct impact on our business and we currently have operations in regions with active carbon taxation. While this has an impact on our CO2 reduction programs, this plays a small role in the projects that Vermilion implements on an annual basis. In the future, the price of carbon may lead Vermilion to look at additional projects to support reduced carbon emissions as well as green energy projects, similar to the cogeneration project that is active in our France business unit and our geothermal projects in the Netherlands. These types of projects support Vermilions assessment of the future development of our business, while effectively managing the cost of carbon as we move through the energy transition.

## **C12. Engagement**

### **C12.1**

#### **(C12.1) Do you engage with your value chain on climate-related issues?**

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

### **C12.1a**

#### **(C12.1a) Provide details of your climate-related supplier engagement strategy.**

---

##### **Type of engagement**

Compliance & onboarding

##### **Details of engagement**

Climate change is integrated into supplier evaluation processes

##### **% of suppliers by number**

5

##### **% total procurement spend (direct and indirect)**

43

## **% of supplier-related Scope 3 emissions as reported in C6.5**

### **Rationale for the coverage of your engagement**

We require 100% of third-party contractors & sub-contractors to be HSE pre-qualified prior to commencing service work. This includes climate-change issues, ranging from compliance with flaring & venting regulations during drilling operations to the maintenance quality of the their equipment (as regular maintenance directly impacts GHG emissions). The prequalification process helps ensure that they have an HSE program in place that meets or exceeds our requirements. We also observe & interact with our vendors on an ongoing basis to ensure that they are adhering to Vermilion's HSE practices, procedures & rules.

This is essential to our approach to climate issues, in part because we operate in regions with very strong regulatory approaches to climate & emissions: we prioritize regulatory compliance, but also the safety & environmental protection of our communities, so this helps ensure our contractors understand this & operate to our standards.

To support this, we hold mandatory monthly HSE meetings in every field district that all staff attend & senior management routinely participate in. On a quarterly basis, the HSE district meetings are replaced by HSE-focused town hall meetings that include our vendors. This has resulted in a better understanding of Vermilion's HSE requirements, & an improved understanding of where & how we can better support our vendors.

Our site & work procedures also provide strong oversight of staff and contractor activities. In addition, contractors must complete online training prior to arriving on site, to ensure that they are familiar with our most important HSE procedures.

With regard to our supply chain, our Corporate Contractor/Vendor Selection and Management Guidelines include specific activities to support HSE performance: for example, having the Vermilion staff member responsible for the vendor provide information and briefings on our HSE program requirements.

In addition, we are conducting a global supply chain risk assessment, analyzing risks based on geography, industry and operations, including climate change policies. As a first step in analyzing our supply chain, we are focusing on all suppliers with which we spent more than \$1 million in 2019, assessing whether they have public commitments to environmental protection, including climate change, in place, & the level of detail & external assurance.

### **Impact of engagement, including measures of success**

The most important impact of engagement in this regard is 100% compliance with climate change-related regulations in our operating areas, which has a direct impact on our company reputation, and on reducing the contribution our suppliers make to Scope 3 emissions. A further impact of the supply chain risk assessment is the identification of

suppliers without public commitments to climate change, which were approximately 50; we have noted, however, that public commitments are rapidly increasing across several categories, including environmental, year over year. We are reassessing those suppliers in 2020, to assess change and the potential for direct engagement with them to encourage public commitments.

In addition, Vermilion engages many of our suppliers and all of our contractors relating to safe and efficient completion of the approved scope of work. Specific to Scope 3 emissions, we continually engage our vendors on reduction of fuel and energy related activities, among other areas of organizational focus. The current focus of this engagement is optimization of resources to reduce the impact and exposure, both from a health, safety and environment perspective, as well as an emissions and climate change impact perspective. Measurements of success related to our engagement, while it is still in the initial stages of implementation, will be the quantification of a sustainability capital effectiveness ratio, to aid in our internal assessment of the supplemental benefit of our capital investments. This will support our strategic objective of Integrated Sustainability, while providing a way for Vermilion to demonstrate to our investors and the public that our market outperformance is correlated to our strong sustainability focus and performance.

## Comment

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### Type of engagement

Engagement & incentivization (changing supplier behavior)

### Details of engagement

Other, please specify

Run a campaign to encourage innovation to reduce climate impacts on products and services

### % of suppliers by number

45

### % total procurement spend (direct and indirect)

35

### % of supplier-related Scope 3 emissions as reported in C6.5

3.3

### Rationale for the coverage of your engagement

We engage with partners (vendors, consultants, peers, etc.) throughout our operating regions to ensure we are pursuing and/or developing industry best practices and identification of opportunities to collaborate on innovated development solutions, as it relates to sustainability and emissions management, while maintaining a focus operational excellence. Vermilion's strategy currently allows for flexible engagement with an additional focus on engaging those organizations in our supply chain where the

supplier has an understanding of sustainability and greenhouse gas emission management. We also have focused on where direct interaction can occur (head office, travel where employees interact with the service provider). New in early 2017, Vermilion altered our capital allocation system to include an assessment of impacts related to sustainability. This assessment is now a requirement of all capital expenditures within our organization. The result of this organizational change is the integration of sustainability engagement on the vast majority of our capital expenditures. As this process is further developed, we anticipate the expansion to include most of vendors across our organization in the short term. Our assessment of sustainability impact currently includes our Scope 3 capital allocation as well as purchased goods and services.

### **Impact of engagement, including measures of success**

Vermilion engages many of our suppliers and all of our contractors relating to safe and efficient completion of the approved scope of work. Specific to Scope 3 emissions, we continually engage our vendors on reduction of fuel and energy related activities, among other areas of organizational focus. The current focus of this engagement is optimization of resources to reduce the impact and exposure, both from a health, safety and environment perspective, as well as an emissions and climate change impact perspective. Measurements of success related to our engagement, while it is still in the initial stages of implementation, will be the quantification of a sustainability capital effectiveness ratio, to aid in our internal assessment of the supplemental benefit of our capital investments. This will support our strategic objective of Integrated Sustainability, while providing a way for Vermilion to demonstrate to our investors and the public that our market outperformance is correlated to our strong sustainability focus and performance.

### **Comment**

## **C12.1b**

**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

---

### **Type of engagement**

Collaboration & innovation

### **Details of engagement**

Run a campaign to encourage innovation to reduce climate change impacts

### **% of customers by number**

14

### **% of customer - related Scope 3 emissions as reported in C6.5**

**Please explain the rationale for selecting this group of customers and scope of engagement**

Since we don't have downstream oil and gas operations, our customers are not traditional consumers; they are instead markets that include North American-based midstream and downstream refiners, Asia Pacific-based refining and lubricant businesses, European downstream refiners, and key aggregators and utilities, such as the 50% state-owned GasTerra in The Netherlands. In some cases, we are mandated to provide products through specific customers (such as GasTerra); in others, there is a transparent and competitive process in which potential customers bid for those products. Our goals for engaging with these entities in our value chain is to (a) ensure they are aware of our commitment to and reputation for ESG issues, including climate change, and (b) by asking for details about their commitment, encourage their own activities to reduce climate change impacts. Our Marketing department has established an ESG section in our communications with potential customers, including requests for proposal, tenders and bid documents. This establishes our commitment to ESG, including climate issues, and requests that entities wishing to purchase our products include information about their commitment to ESG as part of bid packages. This enables us to use the customer-provided ESG information as part of the assessment of the bid packages, including the comparison between bidders. At the same time, it raises awareness with these customers – whether they are successful bidders or not – about the growing criticality of these commitments and associated activities.

**Impact of engagement, including measures of success**

Given that we are at an early stage of this initiative, our measures of success include the number of customers (and potential customers) that we communicate with on ESG commitments, including climate change – this is our input measure. We are also tracking the number of potential customers that respond with their ESG commitment – this is our output measure. As the initiative further develops, we anticipate being able to use outcome measures, such as number of successful bids for which ESG commitments made a material difference, and the potential for developing partnerships based on a mutual recognition of the importance of ESG, particularly climate change, and tracking the results from those partnerships. We anticipate using these results to further communicate with our potential and actual customers.

The current impact is that 100% of all new tenders/requests for proposals or bids, etc. include our ESG commitment and request information on the potential customer's commitment; so far, that covers approximately 14% of our customer value chain, with the expectation that it will increase to 100% over the next several years. We are tracking the number of bids that return with ESG and climate information included, and comparing this for top candidates to the companies' externally communicated ESG and climate information. This provides an assessment of how many companies are responding to our request, and provides an opportunity for further engagement with them on ESG and climate matters.

## C12.1d

### **(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.**

One of Vermilion's defining strengths is our belief that sharing or success is essential to being a success. We have embedded this philosophy in our mission and we continue to live it today. Our objective is to ensure that our stakeholders, shareholders, employees, communities and partners benefit from our achievements. This approach, based on the concepts of inclusive and sustainable growth, frames our business strategy and guides our role in the energy transition.

Vermilion engages our value chain in many ways, one of which is with other companies that are part of our sector. This is important to us because these companies may be our partners or potential partners in our operating areas, and because they are part of our industry sector, and our collective performance on climate issues as an industry is an essential part of the successful energy transition. As a case study, our formal engagement in this regard is as an active participant in a sustainability leadership working group comprised of other companies in the energy industry in Alberta, based in Calgary. This group meets bi-monthly to discuss such issues as challenges, innovation, solutions and best practices regarding sustainability, particularly with respect to climate change and greenhouse gas emissions. Subjects have covered such issues as reporting best practices, methane reduction, systems thinking, collaborative innovation, climate change and GHG reduction case studies from leading companies. The subjects are led each meeting by one of the companies that has a challenge or initiative they wish to engage the group on. In addition, an annual longer workshop expands the work and scope of this member-driven working group to the wider industry at no charge, with the specific intent of sharing best practices and open dialogue that will raise the bar for the entire industry. Outputs include discussion records collated to create living documents housed online that form an ongoing resource for best practices and ideas, and the ability to reach out to this group with questions for the members at any time between meetings.

Vermilion chaired this group in 2016-2017 and continues to be an active member. We have prioritized this method of engagement as directly applicable to our industry, producing ideas and solutions that can be immediately trialled or implemented within the company. One of the ongoing focuses for the group is supply chain, as many of our member companies are either engaging with, development engagement plans, or working to understand how to engage the supply chain, which is the natural extension of this collaborative work. One example of success is the linkage through members of this group this year to an external ESG- and climate-focused initiative that is aiming to standardize reporting on ESG and climate change such as GHG emissions for the oil and gas industry. This is a particular challenge for the industry, given the differences between reporting boundaries and company-specific definitions and approaches. Alignment between other companies in the sector will provide better comparability between companies, better performance assessments, and more decision-useful information for investors and other stakeholders.

We engage with the public by communicating our emission reduction activities through publications and voluntary reporting (such as CDP and our Corporate Sustainability Report).



We engage with our employees on Sustainability and emissions performance at quarterly town hall meetings where we review our six strategic objectives, including Integrated Sustainability. Measures of success on supply chain engagement initiatives will be initiative-specific (i.e. a project-specific emissions reduction target). This is an area that will continue to be developed as Vermilion's Sustainability strategy evolves. Vermilion prioritizes engagement based on the potential for collaborative identification of emission reduction potential, as well as potential effect on Vermilion's brand and license to operate.

Vermilion, on an ongoing basis, looks for opportunities to engage a larger percentage of our value chain based on potential impact of the engagement. Vermilion also engages partners in the value chain where the partner has a specific interest (i.e. investor interest group). In addition, Vermilion is actively working with customers who are developing their own frameworks to assess sustainability, with a view to qualifying as responsible suppliers of natural gas.

We also engage with our governments and regulatory authorities on climate change through our business development activities. For example, we include ESG and climate issues and performance in our bid documents, and actively discuss our performance as part of the bid process, establishing not only our own credentials in this area, but the importance of considering this as a comparator between companies to help advance country performance on NDCs related to the Paris Agreement.

## C12.3

### (C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Funding research organizations

## C12.3a

### (C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Support with minor exceptions	Mandatory carbon reporting brings an important focus to emissions assessment for all industries. In all of our business units we have experts with responsibilities to engage on public and government relations. One portion of this engagement is the various carbon reporting frameworks that our operations are subject to. Our engagement includes direct contact	Vermilion supports standardization of carbon reporting through either legislative solutions at the national level or through regulatory organizations such as stock exchanges. An example of a legislative solution is the EU Non-Financial Reporting Directive. This requires EU companies in the public interest and with more than 500 employees to provide specific non-



		<p>with policy makers, as well as engagement through industry groups.</p> <p>As a case study on carbon reporting, Vermilion’s focus on emissions quantification and management has supported our achievements related to significant emissions reductions of our acquired assets. We see the outcomes of our carbon reporting, our CDP scores and sustainability performance, as an important competitive advantage, and also something that all companies can learn from and improve. We are happy to share our knowledge with our competitors and policy makers. We do this because it is the right thing to do and, additionally, because it’s an incentive for us to keep on improving our sustainability performance.</p> <p>Our concern – and the source of the minor exception – is that current reporting frameworks such as SASB require financial reporting boundaries. This may not be an issue for larger oil and gas companies, but for many small to mid-size companies, reporting emissions on an operated boundary is much more effective from a resource perspective; a change to financial boundary will be costly in terms of personnel time.</p>	<p>financial information in their annual reports. It is currently under review, with the stakeholder input period now closed, but in the meantime those attempting to apply the law also benefit from less regulatory but helpful EU guidelines on reporting climate-related information. There is, therefore, much progress still to be made. Standardized carbon reporting will eventually not only reduce reporting burden on organizations, but will also ensure the data available to analyze is prepared and made available in a consistent format, providing comparable and decision useful information for investors. In the absence of a legislative solution, voluntary disclosure frameworks such as CDP, TCFD and SASB are helping to fill the gap. We support their use to inform potential legislative solutions.</p>
Clean energy generation	Support	<p>Vermilion has engaged policy makers specific to green energy generation in several of our Business Units. An example of this is our partnership in the Green Deal, which is a partnership of 7 companies with the Dutch Government and a non-profit applied science research</p>	<p>Vermilion supports assessment of cogeneration energy potential of active and legacy oil &amp; gas infrastructure. However, in many of our operating areas, this is a new avenue for energy production, and is not covered by existing regulations. Vermilion proposes that policy makers develop regulatory</p>

		<p>organization focusing on the investigation of geothermal energy generation from natural gas infrastructure. As part of our participation, we undertook a geological evaluation of the available 3D seismics. From this, we have concluded that the required Dinantien carbonate platform in Heerenveen is probably not present. So, although we certainly see the possibilities for ultra-deep geothermal in the Netherlands, we consider the opportunities for the successful development of a project at this specific location in Heerenveen within the frameworks outlined to be too small. This means that our consortium was not able to sign the cooperation agreement that marks the next phase of the Green Deal program. We are proud of what has been achieved in a short time within the partnership in the Green Deal UDG, however, and are pleased that the other six consortia will continue the program. While the project identified that this is not currently practical in our area of operation, our participation demonstrates our partnership approach to developing new products and services through research and development. We are also an active participant in the H2020 MEET partnership, which is supported by the European Commission to advance geothermal systems exploration and production with real projects in existing industrial environments.</p>	<p>approval pathways that support assessment of infrastructure at all stages of the production lifecycle to support implementation of projects to produce green, local energy sources. This will support a circular economy approach to oil and gas infrastructure both during its traditional oil and gas production life, and extending well past it.</p>
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## C12.3b

**(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?**

Yes

## C12.3c

**(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.**

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**Trade association**

POLE AVENIA

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

This group is focused bringing together companies, researchers and training institutes to develop technologies to support the geoscience sector with the goal of enhancing recovery and geothermal opportunities, reducing the environmental impact and developing long-term energy and CO<sub>2</sub> storage solutions. The organization's position is that these initiatives will have a positive impact on reducing the carbon intensity of industry in the region and foster technology development for application locally and abroad. POLE AVENIA, located in Pau in southwest France, is the only French competitiveness cluster in the geosciences sector. A competitiveness cluster brings together companies, research laboratories, and schools working in a specific sector. Governments and local organizations are also closely involved in this dynamic. The energy transition is based on two principles: the reduction of primary energy consumption and the development of renewable energy. However, these changes do not affect the impact of fossil energies. Most of fossil resources will remain prominent in the energy mix with a percentage estimated at more than 80% by 2030. Gas and oil will represent 40 to 50% of primary energy consumed against 15% for renewable energies.

Out of 70 competitiveness clusters in France, 12 focus mainly on renewable energies and POLE AVENIA is the only cluster focused on fossil energy, geothermal, geological storage of CO<sub>2</sub> and of energy. So, it is important that POLE AVENIA also focuses on those sectors, to contribute to reducing our dependence on fossil energies during the energy transition. Its ambition is to promote the subsurface component of the energy mix by developing technologies for subsurface applications and by promoting technology and skill transfers. It works in three interconnect markets: oil and gas; geothermal; and geological storage (e.g. CO<sub>2</sub>).

**How have you influenced, or are you attempting to influence their position?**

Yes. A member of the Vermilion France Business Unit sits on the Board of Directors for AVENIA. This participation allows Vermilion's representative to help guide the direction of this organization, based on our experience and technical expertise. Vermilion values strong governance not only in our own operation, but in our partner organizations. We support the approach and direction of Pole Avenia, as it focuses on developing sustainable technologies for the geosciences and facilitates technology transfer in areas where we are active, including geothermal production from traditional oil production, and the potential for transferring oil infrastructure to geothermal in the future. Thus, we can contribute our expertise and experience in this area to move the entire industry forward, including helping to support government contributions in this area.

### C12.3d

**(C12.3d) Do you publicly disclose a list of all research organizations that you fund?**

Yes

### C12.3f

**(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

Following the addition of Integrated Sustainability as one of our six strategic objectives, Vermilion identified personnel in Corporate HSE, Corporate Communications & Community Investment and Investor Relations groups responsible to ensure that corporate guidance and direction relating to health and safety, environment and sustainability is passed effectively to the Business Units and external parties in a consistent manner. This responsibility extends from these groups to the individual Business Units to ensure that activities and engagement completed at the Business Unit level support our Sustainability Policy. In addition, our Corporate Sustainability Lead regularly engages with the Managing Directors of all BUs, the Vice President - Europe, as well as our Public and Government Relations teams, to ensure multi-directional communication on sustainability, including expectations and shared best practices. Regional level outreach to local stakeholders occurs in all BUs and this information is integrated corporately into our overall strategy and to identify areas in the BUs where specific support is required. In 2017, Vermilion assigned additional personnel in all of our BUs to act as the Sustainability Lead for that operation. Vermilion relies on proactive, ongoing feedback from our Business Units to help ensure all guidance that is developed augments our operations and positively affects the communities where we live and work. Vermilion has HSE professionals in each of our operating countries that monitor policy development within their respective jurisdictions. Direction related to communication and strategy associated with climate change flow from Corporate to Business Unit Management within Vermilion's structure. In addition to permanent in-country resources, Corporate also ensures that the resources are available to support each country as it relates to program development. HSE performance is driven by all levels of management at Vermilion.

We are aware that trade and industry associations may, as part of their roles, represent their membership by advocating for government policy and regulations. We monitor that advocacy to

ensure that it fairly represents our position; if there are discrepancies between the organization's position and our company approach, we would engage with the association. This monitoring is carried out at the corporate level by our sustainability team for all business units. Should we identify a discrepancy between our position and the association's position, our approach is to engage with the association to influence their direction. We actively participate in government industry working groups, often at the request of our governments. These are often designed to seek our expertise on technical aspects feedback input as one of many stakeholder positions that governments then consider prior to setting out regulatory or legislative changes. With specific regard to regulations dealing with the Paris Agreement and climate change, our position is that while oil and gas resources are still needed during the energy transition, the provision of clear, stable and reasonable regulations will allow best-in-class traditional energy producers such as Vermilion to continue to operate in an environmentally and socially responsible manner. We also believe that domestic energy supply should be prioritized over importing oil and gas, for its contributions to national energy security, the economic benefits it provides to local communities through employment and local investment, and for its compliance with stringent safety, environmental and workplace regulations.

## C12.4

**(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

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### Publication

In voluntary sustainability report

### Status

Underway – previous year attached

### Attach the document

 2019-Vermilion-Sustainability-Report-Web v2.pdf

### Page/Section reference

Climate change is integrated throughout the report.

### Content elements

Governance  
Strategy  
Risks & opportunities  
Emissions figures  
Emission targets  
Other metrics

### Comment

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**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Complete

**Attach the document**

 2019\_Annual\_Report.pdf

**Page/Section reference**

2019 Annual Report

Page 7 – Sustainability Performance Summary

Page 48-52 – HSE, Sustainability and Risk & Opportunity descriptions

**Content elements**

Governance

Strategy

Risks & opportunities

Other metrics

**Comment**

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**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Complete

**Attach the document**

 2020\_Information\_Circular.pdf

**Page/Section reference**

Page 14 – Sustainability Approach

Page 37-38 – Sustainability Skills Matrix including GHG Emissions and Air Quality

Page 39 – Continuing Education

Page 44-47 – Sustainability/Climate Change Governance, Strategy, Risk & Opportunity Management and Targets and Emissions

Page 55 – Sustainability Committee 2019 Report

Page 70 – Short Term (Bonus) Compensation Link to HS & Environment

Page 72 – Long Term Compensation Link to Sustainability

**Content elements**

- Governance
- Strategy
- Risks & opportunities
- Emissions figures
- Emission targets
- Other metrics

**Comment**

2020 Information Circular

## C15. Signoff

### C-FI

**(C-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.**

### C15.1

**(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.**

	Job title	Corresponding job category
Row 1	President	President

## 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



Bruce MacEachern  
Environmental Advisor  
Vermilion Energy Inc.  
3500-520-3rd Avenue SW  
Calgary, Alberta T2P 0R3

July 31, 2020

Mr. MacEachern,

The purpose of this letter is to clarify matters set out in the assurance report. It is not an assurance report and is not a substitute for the assurance report.

This letter and the verifier's assurance report, including the opinion(s), are addressed to you and are solely for your benefit in accordance with the terms of the contract. We consent to the release of this letter by you to CDP to satisfy the terms of CDP disclosure requirements but without accepting or assuming any responsibility or liability on our part to CDP or to any other party who may have access to this letter or our assurance report.

In accordance with our engagement contract with Vermilion, dated 2017 January 9 (the "contract") (authorized 2016 February 6) and for the avoidance of doubt, we confirm that our *Findings for Greenhouse Gas Verification for 2019 Carbon Disclosure Project Report* to you dated July 31, 2020 (the "assurance report") incorporated the following matters:

1. A "declaration of independence" which specifies that we, the assurance provider, has no conflict of interest in relation to providing the assurance of environmental data for Vermilion, the company which has been assured.
2. Boundaries of the reporting company covered by the assurance report and any known exclusions.  
Consolidation Method: Operational Control  
Operations: Canada, France, Netherlands, Australia, United States of America, Germany, Ireland, Eastern Europe (Hungary and Croatia).
3. Emissions data verified - broken down by Scope 1, Scope 2, and Scope 3 categories.

Scope 1	858,822	tonnes CO <sub>2</sub> e
Scope 2	288,345	tonnes CO <sub>2</sub> e
Scope 3	14,188,287	tonnes CO <sub>2</sub> e

This represents approximately a 16% increase in Scope 1 emissions, a 66% increase in Scope 2 emissions, and a 14% increase in Scope 3 emissions compared to data evaluated from 2018, which had Scope 1, Scope 2, and Scope 3 values of 741,589 tonnes CO<sub>2</sub>e, 173,847 tonnes CO<sub>2</sub>e, and 12,408,270 tonnes CO<sub>2</sub>e, respectively. The increase is related to the full year of reporting for



CBU following the Spartan acquisition in 2018, and the full year of reporting for IBU following Vermillion obtaining operatorship in November 2018.

4. Period covered (e.g. '12 months to DD MM YY')  
12 months to 2019 December 31.
5. 2006 verification standard used  
ISO 14064-3
6. Assurance opinion (incl. level of assurance and any qualifications)  
Limited Level of Assurance
7. Verification provider and accreditations (if relevant)  
CH2M HILL Canada Limited (wholly owned by Jacobs Engineering Group Limited)
8. Lead verifier name and relevant accreditations/professional membership (if relevant)  
Emily Chan, Ba.Sc.