Work Plan Application

Project Information	
Project Title:	State of Environment Reporting
Lead Applicant, Organization, or Community:	Amelie Litalien
Work Plan Identifier Number: If this is an on-going project please fill the identifier number for 24/25 fiscal by adjusting the last four digits: **Example:** D-1-2425 would become D-1-**2425**	D-3-2425
Project Region(s):	Oil Sands Region
Project Start Year: First year funding under the OSM program was received for this project (if applicable)	
Project End Year: Last year funding under the OSM program is requested **Example: 2024**	2027
Total 2024/25 Project Budget: From all sources for the 2024/25 fiscal year	
Requested OSM Program Funding: For the 2024/25 fiscal year	$483,838.00
Project Type:	Focus Study
Project Theme:	Cross-Cutting
Anticipated Total Duration of Projects (Core and Focused Study (3 years))	Year 3
Current Year (choose one):	Focused Study: Year 1 of 3
	Core Monitoring: -Select One-

Contact Information

Lead Applicant/ Principal Investigator: Every work plan application requires one lead applicant. This lead is accountable for the entire work plan and all deliverables.	Amelie Litalien
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Project Summary

In the space below, please provide a summary of the proposed project that includes a brief overview of the project drivers and objectives, the proposed approach/methodology, project deliverables, and how the project will deliver to the OSM Program objectives. The summary should be written in plain language and **should not exceed 300 words**.

UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

Please note that the work plan was drafted with the flexibility to delivery on multiple formats for SOE delivery as scoped by OC/SIKIC and as such the SOE activities in the 2024-25 fiscal will be focused on delivering the OC funding conditions as outlined above.

A fundamental programmatic outcome of the OSM Program is State of Environment (SoE) reporting based on the generation of data, evaluation and reporting products that are cross-cutting and programmatic in nature. As a result, SoE reporting has been identified by the OSM Program governance structure as a key priority for 2024/25.

Building on previous efforts, the primary purpose of this work plan is to ensure that adequate time and planning is incorporated into the 2024/25 work plan to maximize the effective delivery of SoE reporting for all participants and stakeholders, and its utility to inform the Adaptive Monitoring Framework. As a result, this work plan includes two potential approaches (either singularly or combined) to SoE reporting, based on current best practices and experience. It is important to note that the exact scope, approach(es) and methodology to be applied to SoE reporting, including thematic and timing prioritization will be driven by the OSM governance structure and the refreshed Data and Knowledge Integration TAC to ensure programmatic oversight.

The two proposed approaches include a web-based Application Programming Interface (API) toolkit for on-demand data visualization that includes multiple analytical approaches (e.g., limits of change, guideline assessments, trend analysis) for indicators across the OSM Program thematic areas. The web-based API could provide the foundation for text-based SoE reporting, upon which, hard-copy SoE reports could be generated on a regular cycles.

Given the complexities of the OSM Program and the need to ensure accurate, transparent, and repeatable SoE reporting, a phased approach is proposed over three years. Year 1 is proposed to focus on Water Quality, Water Quantity, Groundwater Quantity and Air Quality. Year 2 is proposed to focus on Groundwater Quality, Deposition and Geospatial topics. Year 3 could focus on wetlands and terrestrial indicators, other integrative pieces, cross-cutting thematic areas, focus studies, and outstanding indicators from the first two years (e.g., invertebrates and fish). The braiding of Indigenous Knowledge into SoE reporting will be work-shopped/engaged upon in Year 1. Workshops will also be held to help identify indicators and appropriate methodologies for each thematic area. Key results from focus studies could be integrated into the SoE reporting where possible.

1.0 Merits of the Work Plan

All work plans under the OSM Program must serve the mandate of the program by determining (1) if changes in indicators are occurring in the oil sands region and (2) if the changes are caused by oil sands development activities and (3) the contribution in the context of cumulative effects. In the space below please provide information on the following:

- Describe the key drivers for the project identifying linkages to Adaptive Monitoring framework particularly as it relates to surveillance, confirmation and limits of change (as per OC approved Key Questions).
- Explain the knowledge gap as it relates to the Adaptive Monitoring that is being addressed along with the context and scope of the problem as well as the Source - Pathway - Receptor Conceptual Models .
- Describe how the project meets the mandate of the OSM Program or areas of limited knowledge is the work being designed to answer with consideration for the TAC specific Scope of Work Document (attached) and the Key Questions (attached)?
- Discuss results of previous monitoring/studies/development and what has been achieved to date. Please identify potential linkages to relevant sections of the State of Environment Report.

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Achieving cross-cutting data, analytics, and reporting goals in a SoE context requires specialist knowledge and programmatic guidance so that database design/management, holistic analytical processes, and geospatial driven analyses and visualization are integrated appropriately, and in a robust manner, to fulfill a critical gap in the OSM Programs reporting. As a result, the key driver of this work plan is to collaboratively deliver a web-based and hard-copy SoE report, as this has been identified as a key programmatic reporting product as per the OFA and a high priority deliverable for 24/25 by both OC and SIKIC. The delivery of the final scope, approach, and methodology will be a result of OSM Program governance (OC/SIKIC) direction and guidance.

To support this critical programmatic priority, a SoE Project Team (outlined in section 15) is being established to work with the direction and guidance of the OSM governance structure and the refreshed Data and Knowledge Integration TAC (short form: Data TAC). An initial workshop or series of workshops with SIKIC and/or OC is recommended to define the scope, approaches and methodology, as well as defining the decision-making approval process for SoE products and content, along with guidance on moving SoE related products through the OSM governance structure. Another workshop is proposed on the potential opportunity to braid Indigenous Knowledge into SoE reporting, with SIKIC and ICBMAC support. Additional workshops are recommended to facilitate cross TAC collaboration in the development and delivery of SoE reporting outputs. One fundamental objective of SoE development is transparency and comprehensive engagement with the governance structure and program participants for guidance and direction.

The SoE outputs in year one and year two are proposed to focus on identifying and reporting on environmental changes occurring in the OSM region in multiple thematic areas. The third year is proposed to incorporate relevant focused studies and cross cutting issues that may highlight the main drivers of any identified change within the context of cumulative effects across thematic areas. A summary of the key results/findings from the proposed web-based Application Programming Interface (API) could also provide the foundation for a hard-copy SoE report, which is a key OSM Program mandate.

This work plan builds upon previous SoE reports by proposing similar indicators and thematic areas, while striving to harmonize statistical analyses and outputs into one web-based API tool-kit and reporting system. The goal is to learn from past experiences, building towards a SoE reporting system that meets the needs of a diverse audience, from the general public to program participants, across a range of

backgrounds and degrees of specialization. In particular, the proposed web-based SoE API tool-kit would allow any audience to look at the data for various indicators from multiple thematic areas and assess them for change. Additionally, they could export relevant data and even analytical results, providing various stakeholders an opportunity to address their information/data/analytical needs by allowing them to investigate their own key questions regarding environmental change and dynamics in the OSM region.

Given the place-based, national, and global interest in the OSM Program, its data and outputs, a combined web-based and hard-copy SoE approach, leveraging both text-based objective reporting and user-driven on-line analytical and visualization tools, is proposed to maximize accessibility. The rationale for this proposed approach is driven by both the data richnesses and complexity of the OSM Program, and the opportunity to highlight the quality of information being generated.

Specifically, web-based APIs, or interactive dashboards/widgets etc., are increasingly used worldwide to provide endless reporting flexibility. In particular, APIs are powerful tools that collate information, provide overviews (e.g, figures, reports, maps), and data analyses in relatively simple to navigate user interfaces for audiences with diverse backgrounds. Web-based APIs/dashboards are truly powerful toolkits for on-line data visualization and analysis allowing end users with different levels of experience to explore datasets and, if they want to, dive in, and undertake more in-depth data analyses such as levels of change, trend tests, and comparisons to guidelines and/or thresholds. Thus, an additional goal of a potential web-based SoE API is to support Adaptive Monitoring.

In particular, end-users could use the SoE API to assess if indicators from the various thematic areas are indeed changing, based on multiple statistical assessments of the data, with the SoE API analytical tool-kit. Importantly, web-based APIs do not have stringent limitation of length/analysis reporting compared to text-based deliverables, facilitating the potential inclusion of any indicator with relatively sufficient data quality/quantity in a web-based API system. Accordingly, a web-based API systems holds significant potential for providing a rigorous and yet flexible foundation of SoE reporting, including data visualization and analysis, with potential opportunities outlined in section 10 below. Of note, the term API is used throughout this work plan as it captures the complexity of the data generated by the OSM Program and the varied approaches to data analysis that are required for SoE reporting. Essentially, the proposed SoE web-based API could eventually include a series integrated dashboards (e.g., water and air quality, geospatial, cumulative effects, etc.) directly connected in real time to the on-line data portal resulting in a world-class state of environment reporting system.

Of note, this work plan only recommends potential indicators, visualization and analyses options based on the known capacity of APIs in relation in SoE reporting. The type of indicators included in the API, along with the statistical assessments and the data visualization toolkit will be driven by direction and guidance from OC and SIKIC, then developed by the SoE Project Team, adapted and updated in a series of workshops, followed by a formal confirmation/agreement from OC and SIKIC, while working in close collaboration with the refreshed Data TAC throughout this process.

2.0 Objectives of the Work Plan

List in point form the objectives of the 2024/25 work plan below

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- OC/SIKIC workshop(s) to define approach, scope, and methodology to the SoE
- Workshop the opportunity to braid Indigenous Knowledge into SoE reporting
- Workshops on indicators, data visualization, and statistical approaches
- A web based API with multiple statistical tools for Water Quality, Water Quantity, Groundwater Quantity, and Air Quality
- Draft hard-copy SoE report for Water Quality, Water Quantity, Groundwater Quantity, and Air Quality
- A work plan for year 2 of the SoE reporting

3.0 Scope

Evaluation of Scope Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would:

- Be in scope of the OSM Program (e.g., regional boundaries, specific to oil sands development, within boundaries of the Oil Sands Environmental Monitoring Program Regulation)
- consider the TAC-specific Scope of Work document and the key questions
- integrate western science with Indigenous Community-Based Monitoring)
- address the Adaptive Monitoring particularly as it relates to surveillance, confirmation and limits of change as per approved Key Questions.
- have an experimental design that addresses the Pressure/Stressor, Pathway/Exposure, Response continuum
- produce data/knowledge aligned with OSM Program requirements and is working with Service Alberta
- uses Standard Operating Procedures/ Best Management Practices/ Standard Methods including for Indigenous Community-Based Monitoring

3.1 Theme

Please select the theme(s) your monitoring work plan relates to:

☐ Air	☐ Groundwater	☐ Surface Water	☐ Wetlands
☐ Terrestrial Biology	☐ Data Management Analytics & Prediction		☑ Cross Cutting

3.2 Core Monitoring, Focused Study or Community Based Monitoring

Please select from the dropdown menu below if the monitoring in the work plan is “core monitoring” and/or a “focused study”. Core monitoring are long term monitoring programs that have been in operation for at least 3 years, have been previously designated by the OSM program as core, and will continue to operate into the future. Focused studies are short term projects 1-2 years that address a specific emerging issue.

Focused Study

Themes

Please select the theme from the options below. Select all that apply.

☐ Air	☐ Groundwater	☐ Surface Water	☐ Wetland
☐ Terrestrial	☑ Cross-Cutting		

3.3.6 Cross-Cutting Across Theme Areas

3.3.6.1 Sub Themes

Other: (Describe in space below)

If “Other” was selected from the drop down list above please describe below:

SoE reporting

3.3.6.2 Cross-Cutting - Key Questions:

Explain how your cross-cutting biological monitoring program addresses the key questions below.

Is data produced following OSM Program requirements and provided into the OSM Program data management system?

No sampling/field data will be generated.

Do methodologies use relevant Standard Operating Procedures/ Best Management Practices/ Standard Methods?

Yes

How does the monitoring identify integration amongst projects, themes or with communities?

There is no monitoring involved.

With consideration for adaptive monitoring, where does the proposed monitoring fit on the conceptual model for the theme area relative to the conceptual model for the OSM Program?

This SoE reporting strives to provide a foundation for adaptive monitoring

How will this work advance understanding transition towards adaptive monitoring?

The SoE reporting potentially could provide fundamental results on potential changes in indicators across thematic areas (e.g. groundwater, surface water quality, air, wetlands, etc.) that could be used to inform adaptive monitoring.

Is the work plan contributing to Programmatic State of Environment Reporting? If yes, please identify potential linkages to relevant sections of the State of Environment Report.

This work plan outlines an approach for SoE reporting.

4.0 Mitigation

Evaluation of Mitigation Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially inform:

- efficacy of an existing regulation or policy
- an EPEA approval condition
- a regional framework (i.e., LARP)
- an emerging issue

Explain how your monitoring program informs management, policy and regulatory compliance. As relevant consider adaptive monitoring and the approved Key Questions in your response.

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One of this work plan's key deliverables, the web-based SoE API, is a consensus-based integrated evaluation and reporting system with regional data on environmental conditions that holds potential for decision-makers and other stakeholders to investigate environmental change and/or assess cumulative environmental effects in the OSM region in order to help inform management (e.g., emerging issues/ approvals) and regulatory action.

5.0 Indigenous Issues

Evaluation of Indigenous Issues Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially:

- Investigate Indigenous communities key questions and concerns
- Includes culturally relevant receptor(s) and indicator(s)
- Include or be driven by Indigenous communities (participatory or collaborative)
- Develop capacity in Indigenous communities
- Include a Council Resolution or Letter of Support from one or more Indigenous communities
- Describe how ethics protocols and best practices regarding involvement of Indigenous peoples will be adhered to
- Provide information on how Indigenous Knowledge will be collected, interpreted, validated, and used in a way that meets community Indigenous Knowledge protocols

Explain how your monitoring activities are inclusive and respond to Indigenous key questions and concerns and inform the ability to understand impacts on concerns and inform Section 35 Rights

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SIKIC and the Indigenous Community-based Monitoring Advisory Committee (ICBMAC) should direct the potential inclusion of Indigenous Knowledge/indicators into SoE reporting. A workshop is proposed to discuss optimal avenues/current thinking/other opportunities to report on Indigenous indicators and thematic topics if applicable/feasible. In particular, it will be important to discuss parallels and linkages with the FMMN CBEMP - data tool.

Does this project include an Integrated Community Based Monitoring Component?

-Select One-

If YES, please complete the ICBM Abbreviated Work Plan Forms and submit using the link below

ICBM WORK PLAN SUBMISSION LINK

5.1 Alignment with Interim Ethical Guidelines for ICBM in the OSM Program

Are there any community specific protocols that will be followed?

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To Be Determined (TBD) based on discussions with SIKIC and ICBMAC if there is a possibility to incorporate Indigenous Knowledge/indicators into the SoE, and if there is, then methods will be developed along ethical guidelines for their inclusion. The goal of the first year of this work plan is to ascertain the potential opportunity of braiding Indigenous Knowledge into the SoE reporting system through a workshop and other engagement. This conversation should include parallels, linkages, and opportunities with the FMMN CBEMP - data tool. Years 2 would strive to outline the approach required with respect to ethical guidelines, protocols, etc., and Year 3 could strive to incorporate Indigenous Knowledge indicators into SoE reporting based on the previous engagement and consultation.

Does the work plan involve methods for Indigenous participants to share information or knowledge (e.g. interview, focus group, survey/structured interview), or any other Indigenous participation? If yes, describe how risks and harms will be assessed, and the consent process that will be used.

TBD

Do the activities include any other collecting/sharing, interpreting, or applying Indigenous knowledge? Please describe how these activities will be conducted in alignment with the Interim Ethical Guidelines, and any community-based protocols and/or guidelines that may also apply.

TBD

Indicate how Indigenous communities / Indigenous knowledge holders will be involved to ensure appropriate analysis, interpretation and application of data and knowledge.

TBD

How are Indigenous communities involved in identifying or confirming the appropriateness of approach, methods, and/or indicators?

TBD

How does this work plan directly benefit Indigenous communities? How does it support building capacity in Indigenous communities?

TBD

How is the information from this work plan going to be reported back to Indigenous communities in a way that is accessible, transparent and easy to understand?

TBD

6.0 Measuring Change

Evaluation of Measuring Change Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would potentially:

- assess changes in environmental conditions compared to baseline (e.g., validation of EIA predictions)
- report uncertainty in estimates and monitoring is of sufficient power to detect change due to oil sands development on reasonable temporal or spatial scales
- include indicators along the spectrum of response (e.g., individual, population, community)
- focus on areas of highest risk (where change is detected, where change is greater than expected, where development is expected to expand collection of baseline).
- measure change along a stressor gradient or a stressor/reference comparison

Explain how your monitoring identifies environmental changes and how can be assessed against a baseline condition. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

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The primary objective of the SoE Report is to assess change across multiple indicators from the thematic areas with respect to baseline condition(s) (potentially short term, medium, or long term, or all options, depending on the availability of the data). More information on potential approaches to baseline development is outlined in the benchmarks text box below (in Section 10), using an example for developing baselines from the water quality theme. Uncertainty estimates and multiple statistical assessments of potential change could be included for indicators across multiple spatial scales and potentially a spectrum of response for relevant thematic areas where possible.

As the SoE report potentially could be built upon a web-based API, all sites with a sufficient record of relevant data can be incorporated, including areas of highest risk and areas where development is expected to expand. The API could be built to allow end-users to compare change along stressor gradients (e.g., longitudinally down stream, or different diversity metrics, depending on available data).

7.0 Accounting for Scale

Evaluation of Accounting for Scale Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would potentially be:

- appropriate to the key question and indicator of interest
- relevant to sub-regional and regional questions
- relevant to organism, population and/or community levels of biological organization
- where modelled results are validated with monitored data
- where monitoring informs on environmental processes that occur at a regional scale. e.g. Characterizing individual sources to gain a regional estimate of acid deposition and understand signal from individual contributing sources.

Explain how your monitoring tracks regional and sub-regional state of the environment, including cumulative effects. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

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table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

This work plan capitalizes on existing monitoring data at the regional and subregional level to report on the SoE. The capacity to examine different spatial scales of data across the thematic areas could be built explicitly into the web-based API and components/questions of scale could be included into the hard-copy SoE Report.

8.0 Transparency

Evaluation of Transparency Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially include:

- a plan for dissemination of monitoring data, including appropriate timing, format, and aligns with OSM program data management plan
- demonstrated transparency in past performance
- identified an annual progress report as a deliverable
- reporting of monitoring results occurs at timing and format that is appropriate for recipient audience.

Explain how your monitoring generates data and reporting that is accessible, credible and useful. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

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The proposed approach is to disseminate two iterations of SoE reporting, a hard copy SoE report and a web-based API integrative system that will be updated in real time for data points, and potentially bi-annually for the statistical assessment and analysis (e.g. after the data/results for a season from a thematic group have been validated). The key objective of a web-based API SoE reporting format could be to make sure that the data analysis generated for the SoE reporting is accessible, credible, and useful for various audiences and end-users while also holding significant potential to help inform adaptive monitoring by highlighting indicators that are significantly changing.

9.0 Efficiency

Evaluation of Efficiency Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would include:

- appropriately addressed a risk-informed allocation of resources
- identified the role and justification for each staff member on the proposed work plan
- identified in-kind and leveraged resources (e.g., resources and approaches are appropriately shared with other OSM projects where possible)
- established partnerships (value-added) and demonstrated examples of coordinated efficiencies (e.g., field, analytical)
- identified co-location of monitoring effort
- demonstrated monitoring activities and information collected are not duplicative
- considered sampling/measurement/methods compatibility to other data sources (e.g., AER)

Explain how your monitoring is integrated with other OSM projects and incorporates community-based participation and/or engagement in proposed monitoring activities. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

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This work plan is highly integrated with other OSM projects by leveraging their data in order to provide the foundation for SoE reporting. Engagement during two workshops regarding indicators and their evaluation ideally could occur to help optimize the SoE reporting process. The results from web-based SoE API could be designed to help directly inform adaptive monitoring by identifying indicators with significant changes.

The role of each staff member is justified below in section 15. The web-based API strives to leverage previous monitoring data (no new monitoring data is collected) from across thematic area to help share resources required.

10.0 Work Plan Approach/Methods

List the Key Project Phases and Provide Bullets for Each Major Task under Each Project Phase

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NOTE: To meet the timelines in the funding conditions there will be two workshops, the SoE Scoping workshop with OC/SIKIC on May 8/9th and then a technical workshop with subject matter experts from multiple knowledge streams in early June.

Below are some key recommended project phases for consideration by the governance structure.

SoE Scoping Workshop (April 2024):
- OC/SIKIC workshop to outline the scope, approach, and methods of the SoE development
- Identify key participants/approaches for the thematic workshops (Phases 4&6 below)
- Provide guidance on moving SoE related products through the OSM governance structure
- Outline the decision-making approval process for SoE products and content

The following phases are proposed, recognizing that these are suggestions and subject to change as a function of the OC/SIKIC SoE scoping workshop:

Phase 1: Identify web-based API host and consulting/staffing needs
- Determine whether existing data hosts or other providers could/should be the best provider to support the SoE API
- Identify/fill any additional consulting/staffing needs (e.g. end user accessibility/data programming)
- This is primarily a Year 1 need, but ideally the API host/support should be assessed with some degree of regularity
- This phased cycle provides a general road map for incorporating new themes into the API

Phase 2: Indigenous Knowledge and the SoE (April 2024)
- Engage with SIKIC and ICBMAC on the opportunity to include Indigenous Knowledge in SoE reporting
- Workshop opportunities and potential Indigenous indicators if/where appropriate
- Develop an outline to include Indigenous Knowledge/indicators into SoE reporting (if/where appropriate) in Years 2/3.

Phase 3: Prepare Data (May/June 2024)
- Obtain data for relevant thematic areas
- Assess the quality/quantity of available data (e.g. EPA, ECCC, others)
- Identify the potential for baseline/benchmarks development
- Identify and test potential data visualization and statistical approaches
- Prepare slide deck for workshop 1 of some best practices included below and other approaches that arise during the work planning process and scoping workshops

Phase 4: Workshop 1 (June/July 2024)
- Discuss quality of the data and potential indicators to include for web-based SoE

- Identify potential baseline/benchmark datasets for assessing changes in environmental condition
- Discuss/identify relevant tools/methodologies/approaches to assess changes in environmental condition

Phase 5: Develop API (Summer/Early Fall 2024)
- Incorporate workshop feedback into the development of an API
- Highlight key results/outcomes that would be relevant for the hard-copy SoE report
- Test the API with workshop participants, SIKIC, OC, relevant TACs, and potentially other SMEs prior to workshop 2

Phase 6: Workshop 2 (October/November 2024)
- Present the API to participants and highlight some key outputs
- Discuss potential options for improving the functionality and the user interface
- Identify potential indicators, data visualization, or analysis approaches that are missing
- Discuss strengths and weaknesses of the API along with opportunities to improve the end-user experience
- Discuss main results and determine what key results/findings that are important for the hard copy SoE

Phase 7: Finalize Draft API for approval (December/January 2024)
- Incorporate recommendations from the second workshop into the API
- Do more end-user testing to ensure the recommendations work and the end-user experiences is optimized
- Staged internal roll-out of the API to various internal programmatic end users to provide ongoing troubleshooting/testing and adaptive updating based on feedback

Phase 8: Draft text-based API (February/March 2025)
- Pull key results/tables/figures from the API and compile into a draft text-based outline/report
- Try to automate as many components of this procedure as possible
- Provide links to focus studies where applicable/relevant

SoE Annual Wrap up Meeting (March 2025)
- Present web-based API to OC/SIKIC
- Incorporate feedback from the process for the next round of indicator development
- Discuss outline/draft report for hard-copy SoE reporting and next steps

Describe how changes in environmental Condition will be assessed

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UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

Multiple approaches including data visualization and analysis tools, might be developed, considered and included in the SoE API to asses changes in environmental condition for each of the thematic areas. The list of final approaches needs to be determined and agreed upon by OC/SIKIC and should be based upon the workshops. Some potential steps are presented below as examples relevant to SoE reporting used in Alberta and/or in the OSM region. The ideas listed here are not exhaustive by any means. They are presented to demonstrate some potential possibilities and opportunities regarding presenting/analyzing the type of data structures that are being considered for inclusion in the first year of the web-based SoE development.

One goal is that the fundamental story lines in the SoE reporting could answer whether or not there are

changes in environmental condition and whether or not there are exceedances of guidelines or other relevant thresholds. In the future, more comprehensive analysis could be integrated to assess cumulative effects directly in the web-based API.

1) A good place to start is the development of a clear and effective data visualization toolkit which is fundamental to understanding changes over time and is accessible to an audience with diverse backgrounds, from the general public to SMEs. Data visualization toolkits often include a series of plots, such as scatter plots and box plots, ideally with log-scale options available with a click of a button. In particular there could be multiple box plots, including some with months and years on the x-axis to illustrate various temporal dynamics of the indicators. Also, there may be a series of sites/stations on the x-axis to compare sites in a region or longitudinally downstream in a watershed. Where available, guidelines, or other key metrics/thresholds could be included on these plots with a click of a button to help the end-user visualize the proximity of indicators to guidelines or other key metrics. All the data behind the plots should be exportable by the end-user. Other recommended plots or data visualization approaches raised during the scoping with SIKIC and OC, or during the workshops could also be included. This starting point of the SoE reporting system essentially allows the data to speak for themselves. A series of statistical tests and threshold/guideline comparisons could then built upon/linked to the foundation built from the data visualization toolkit.

2) Alongside the data visualization, the web-based API ideally could include an assessment of any water quality/quantity guidelines, ambient air quality objectives/guidelines and/or other key metrics (thresholds/limits) relevant to the OSM region (i.e., Fort McKay Permissible Levels for air quality). In particular, all indicators with applicable and published guidelines/objectives could be assessed and reported upon in both the web-based API and hard-copy SoE reports. Additionally, distance to the guidelines/objectives/etc., could also be reported along with other key metrics raised during the scoping, workshops, end-user testing, and/or other stages of the API/SoE development.

3) Another approach that could be valuable in the web-based API could be the assessment of change from a baseline for indicators with an appropriate length of record. A discussion on the baseline is included in the next text box below. If a baseline can be established, both the peaks of the data (10th/90th percentile) and the medians (50th percentile) could be compared to a reporting dataset with ideally a minimum 3 year rolling window for seasonal data. Two seasons (open/ice covered) are regularly included in water quality reporting across Alberta as often various indicators have seasonal dynamics resulting from the influence of various environmental drivers (e.g., precipitation, temperature, light availability, etc.). Median values are helpful for comparing reporting data to baseline periods to understand changes in chronic conditions, whereas peak changes represents more short-term, acute conditions. A two-step procedure could be used to assess changes between a reporting period (a 3-year rolling window of seasonal data) to the baseline period (potentially short or longer term) to assess environmental change. The first step could compare the median and peak values between the reporting and baseline data. Censored data, or data below the limits of analytical detection, could be substituted with the maximum detection limit in the combined reporting/baseline dataset, excluding outliers. Where there is a change, Mann-whitney u-tests and binomial tests could be used to assess if the change is indeed significant. Mann-whitney u-tests are often recommended as environmental data is not typically distributed normally. Thus the Mann-whitney u-test is often more applicable for consistent application on large environmental datasets. For cases with more than 50% censored data in the baseline or reporting datasets, a test for censored empirical cumulative distribution functions difference could be used. Binomial tests help determine if the number of samples exceeding the peak value are greater than expected based on the samples collected. Power analysis could be incorporated to help report uncertainty. Cumulatively, this approach could determine where there are significant changes in environmental condition for the central tendency (median) and peak (10th/90th percentiles) of the indicators being assessed. This approach is based off of provincial work updating the statistical approach used in the Upper Athabasca Region and North Saskatchewan Region surface water quality frameworks and thus could provide some synergy with water quality reporting across Alberta. The foundation of the approach could also be applicable to water

quantity, groundwater and other thematic areas with sufficient length of record and quality of available data.

4) Additionally monitoring triggers or limits of change could also be assessed for indicators with sufficient data quality. In particular, assessing monitoring limits provides an additional line of evidence to determine if there has been significant changes in environmental conditions. The limit of change analysis could help determine if the magnitude of difference between the baseline and reporting datasets for a particular indicator are outside the normal range of variability (e.g., two standard deviations of the baseline dataset). Using this approach in addition to the assessment of central tendency or peak changes above could help illustrate which indicators are having a more pronounced change in the OSM region.

5) Another valuable approach could be the assessment of change points in the data sets. Change point analysis is an effective way to determine whether and when a significant change has occurred in a given dataset. Change points can occur in the data set for multiple reasons (e.g., changes in analysis method, changes in sampling regime, changes in environmental condition, etc.). The change point analysis could be conducted to assess if there has been significant changes in central tendency, variance or both simultaneously. The end-user could be able to conduct these three tests in the web-based API, individually or all at once, to investigate for instances in the dataset where a significant change occurred.

6) Trend tests are often employed to determine whether parameters are changing in environmental conditions over time. For trend tests, data sets are often first assessed for heterogeneity with the Van-Belle Hughes test and serial dependence with the Breush-Godfrey test. To assess seasonality either a Kruskal-wallis/Mann-whitney could be used, or for stations with censored data, a test for censored empirical cumulative distribution functions difference may be run. The suite of pre-trend testing helps determine if a Seasonal Mann-Kendall (SMK) with or without a continuity correction, or a Mann-Kendall (MK) test with or without pre-whitening is appropriate for the trend analysis. In cases where non-seasonal data was not serially dependent, trends ideally could be assessed with a MK test. For non-seasonal data, that is serially dependent, the data could be whitened before running the MK test. Where seasonality was evident, with or without serial dependency, a SMK test might be run without or with a continuity correction respectively based on the pre-trend test results. Tests can be conducted annually and with data for the two (or more) major seasons to identify trends that may be occurring seasonally. The annual percent change could be reported by dividing the site's slope for each indicator, as determined by the appropriate trend test, by the site's median value over the study period. Where possible, flow-weighted trends tests are also quite valuable and could be conducted following the same procedure above after flow weighting the indicators of choice. Each of these individual options can be available for end-users to assess for significant trends in various indicators across themes, with the potential for them to compare the results from the different trend test approaches in the web-based API.

7) Other Indigenous Knowledge or theme specific assessments of change could be considered for inclusion in both the web-based API and hard-copy reporting. For example, for geospatial and potentially wetland indicators, a map-based tool could be created where end-users clip out a portion of the landscape, or select a catchment. For the clipped area or catchment, multiple geospatial and/or wetland attributes potentially could be identified and summarized for the end-users.

Indeed other approaches from focal studies or other ideas/suggestions raised in the scoping, workshops and API development/testing could potentially be included. The caveat being one key goal is to avoid using complex analysis of the data after transformations in the initial API development, as the key functionality of the web-based API is based upon visualizing the statistical results (e.g. steps 2-5 above) on top of the basic, fundamental plots (scatter plots/box plots) outlined in step 1, without transformation or plotting of the residuals. Importantly, the web-based API should be accessible to any audience, and these more complex analytical approaches may not be optimal as the front-facing visualization component in the API. Indeed, they could be layered on in updates as the SoE progresses, particularly when focusing on developmental goals outlined for year 3.

A second key goal is to harmonize the approach to data analyses across as many themes as possible. Again, these key goals strive to create an accessible visualization and analysis API for a diverse audience (public, OSM participants, etc.), that includes a data-visualization tool with multiple levels of analysis, from general (e.g., scatterplot/boxplots) to those with increasing complexity (e.g., pre-whitened trend tests on flow weighted data). The fundamental objective would be to strive to create a consensus-based user-friendly plotting/analytical tool that is consistent across multiple themes, providing any end-user with the potential to assess environmental change across the OSM region.

Are there Benchmarks Being Used to Assess Changes in Environmental Condition? If So, Please Describe, If Not, State "NONE"

UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

Multiple benchmarks/baseline datasets could be incorporated to assess changes in environmental conditions. It will be valuable to discuss approaches to developing baseline/benchmarks during the OC/SIKIC SoE scoping, and subsequently with the refreshed Data TAC, during the theme specific workshops, with relevant TACs, and also other SMEs/program participants as needed. In particular, any data from ECCC, EPA, or other sources should be initially considered for inclusion if it is publicly available.

As an example for developing benchmarks from the surface water quality theme, there were two types of data records evident when examining the monitoring data available: active sites with long records (18+ years) and active sites with short records (<10 years). The data contains the potential for essentially developing two baseline benchmarks: A) Assessing recent change with the short term data (e.g., use a baseline from 2016-2020 and compare to data from 2021-2023); and, B) Assessing longer term change (e.g., use a baseline from 2003-2013). For the active sites with longer records, a baseline dataset could be established over any time period, the key being the use of comparable data with relatively similar analytical methodologies and sampling regimes/methodologies for a given thematic area. Ultimately, the selection of the benchmark/baseline datasets is often guided by the quality of data available, the length of record, and the influence of potential changing analytical methodology/sampling regime on the data quality.

Essentially the availability of comparable data over sufficient short, medium, or long term temporal periods will allow baseline benchmarks to be developed and used to asses changes in environmental condition. A similar approach will be applied to the various thematic groups considered for development in the SoE system. Workshops are recommended for the thematic groups proposed to be included in the SoE API to discuss potential benchmark/baseline datasets and ensure cohesion with the work underway/completed by the various TACs. Nonetheless, at the end of the day, often it is the quality and availability of consistent datasets that regularly guides the establishment of baselines/benchmarks to assess changes in environmental condition.

(e.g., objectives, tiers, triggers, limits, reference conditions, thresholds, etc.)

Provide a Brief Description of the Western Science or Community-Based Monitoring Indigenous Community-Based Monitoring Methods by Project Phase

Not applicable (there is no monitoring included as part of the SoE workplan)

List the Key Indicators Measured, If Not Applicable, State N/A

UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.
----------This work plan recommends the use of any potential indicators, with sufficient length of record and quality for the web-based API. Thereafter, a sub-set of these indicators could be considered for inclusion in the hard-copy SoE report. The list of indicator examples below is not exhaustive and any feedback during the work planning process, workshops, and thereafter is always welcome. The list of final indicators needs to be based upon recommendations by the workshop and confirmed by the governance structure, with decision-making processes outlined in the scoping exercise.

The proposed thematic areas across each of the years of the project is based on the suitability of the datasets to lend themselves towards API reporting, with increasing complexity in SoE reporting for the thematic areas as you progress to Years 2 and 3. For example, the geospatial theme would likely require a different API structure/user interface that could also provide the foundation for wetlands, terrestrial, and biological thematic areas. In contrast, the thematic areas proposed for Year 1 lend themselves well to API SoE reporting together, as they have similar data structure and consistency. Additionally, the thematic areas proposed for Year 1 are known stakeholder priorities.

Year 1:
- Surface Water Quality (e.g., nutrients, metals, ions, PACs)
- Surface Water Quantity (e.g., water levels, streamflow and relevant metrics/thresholds)
- Ground Water Quantity (e.g., groundwater level, days below monthly BNGWL)
- Air Quality (e.g., NOx, NH3, NO2, SO2, PM2.5, O3, VOCs, THC, TRS, NMHC, PACs)

Year 2:
- Ground Water Quality (e.g., nutrients, metals, ions, quantity/levels, PACs)
- Deposition (e.g., BCat, N, S pH, PACs, Metals (including Hg))
- Geospatial (e.g., land use, land cover, environmental pressures, human footprint, etc).

Year 3:
- Wetlands (e.g., wetland distribution/diversity, species diversity, nutrient deposition, contaminants)
- Terrestrial and Biological Monitoring (e.g., wildlife/habitat change, diversity metrics, BADR highlights)
- Invertebrates (e.g., EPT abundance, other diversity metrics, invertebrate contaminants (PACs, metals)
- Fish (e.g., diversity metrics, tissue contaminants (PACs, metals)).

Other potential options:
- Indigenous Knowledge indicators (will be workshopped/engaged upon in Year 1).
- Hydrological connectivity

11.0 Knowledge Translation

In the space below, please provide the following:

- Describe the plan for knowledge transfer and distribution of learnings from the project. This could include workshops, publications, best practice documentation, marketing plan, etc.
- Demonstrate that the knowledge transfer plan is appropriate for the intended end-users.

UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

The web-based API and hard-copy SoE reports are proposed as the fundamental deliverables that could require a marketing plan/dissemination.

For the web-based API, videos may be created to help-end users navigate potential data analysis options to understand the potential of the API. Workshops with various stakeholders should occur during the testing phase (Workshop 2 outlined above in the phases section 10.0). A consultant could be contracted to help improve usability for end-users coming from diverse backgrounds.

From a marketing/dissemination perspective, a multi-pronged approach would be optimal where the link to the API is shared widely by all OSM partners, and distributed through email lists. Furthermore, the API could be linked to on various OSM, EPA and ECCC websites. News releases can be used to highlight the roll-out of the API. This information can be included in e-newsletters from various project partners. The key will be to ensure a wide-spread distribution of the API link to various stakeholders in various formats from as many project partners as possible.

The text-based report should be shared similarly (e.g., emails, e-newsletters, news releases, web links from various stakeholders/partners), though at different times of the annual reporting cycle to help maintain interest in the SoE reporting system.

12.0 External Partners

List by project or project phase each component that will be delivered by an external party (including analytical laboratories) and name the party. Describe and name the associate work plan/grant/contract for these services. * state none if not required

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UPDATE (APRIL 29, 2024): As per the Oversight Committee (OC) funding condition, this work plan will report on aquatics, specifically water quantity and water quality in 2024-25 (Year 1), with a focus on data integration and hard-copy reporting. The API visualization and other theme areas will follow in 2025-26. Additionally, an update on SoE reporting will be provided to OC by June 30, 2024 including the planned table of contents, format outline and key messages for review. A complete and final draft of the SoE report to be provided to OC by September 30, 2024, to include a content review. Workshops associated with the work plan to include the OC, SIKIC, the SW TAC, and the Data and Knowledge Integration TAC, and be informed by the draft Adaptive Monitoring Framework.

The main external project partner will be the API host. The existing data host is a potential candidate as they are already hosting the data platform and directly connecting the API to the data platform is highly

desirable. Other potential options should be considered in Phase 1 of the SoE API development.

*To ensure complete work plan proposal submission, all grants and contracts listed in this section should also be captured in Grants & Contracts.

13.0 Data Sharing and Data Management

For 2024-25 the following approach will be taken by the OSM Program related to data sharing.

For all work plans of a **western science** nature funded under the OSM Program, data sharing is a condition of funding and must align with the principle of **"Open by Default"**. In this case, all data is to be shared with the OSM Program as directed by the OSM Program Data Management work plan.

For all work plans involving **Indigenous Knowledge** as defined below and funded under the OSM Program, data sharing is a condition of funding and the Indigenous Knowledge components of the work plan must align with the principle of **"Protected by Default".** In this case, all data as defined as Indigenous Knowledge, are to be retained by the Indigenous community to which the Indigenous Knowledge is held.

Indigenous Knowledge is defined as:

*"*The knowledge held by First Nations, Inuit and Métis peoples, the Aboriginal peoples of Canada. Traditional knowledge is specific to place, usually transmitted orally, and rooted in the experience of multiple generations. It is determined by an Aboriginal community's land, environment, region, culture and language. Traditional knowledge is usually described by Aboriginal peoples as holistic, involving body, mind, feelings and spirit. Knowledge may be expressed in symbols, arts, ceremonial and everyday practices, narratives and, especially, in relationships. The word tradition is not necessarily synonymous with old. Traditional knowledge is held collectively by all members of a community, although some members may have particular responsibility for its transmission. It includes preserved knowledge created by, and received from, past generations and innovations and new knowledge transmitted to subsequent generations. In international or scholarly discourse, the terms traditional knowledge and Indigenous knowledge are sometimes used interchangeably.*"*

This definition was taken from the Canadian Government's Tri-council Policy Statement for Ethical Research involving Humans (Chapter 9, pg. 113) and is an interim definition specific to the Oil Sands Monitoring Program.

13.1 Has there, or will there be, a Data Sharing agreement established through this Project? *

No

13.2 Type of Quantitative Data Variables**:**

-Select One-

13.3 Frequency of Collection:

-Select One-

13.4 Estimated Data Collection Start Date:

NA

13.5 Estimated Data Collection End Date:

NA

13.6 Estimated Timeline For Upload Start Date:

NA

13.7 Estimated Timeline For Upload End Date:

NA

13.8 Will the data include traditional knowledge as defined by and provided by an Indigenous representative, Community or Organization?

No

Table 13.9 Please describe below the Location of Data and Data Type:

Add a Data Source by clicking on the add row on the bottom right side of table

Name of Dataset	Location of Dataset (E.g.:Path, Website, Database, etc.)	Data File Formats (E.g.: csv, txt, API, accdb, xlsx, etc.)	Security Classification
API	New (to create)	API	Open by Default

14.0 2024/25 Deliverables

Add an additional deliverable by clicking on the add row on the bottom right side of table

Type of Deliverable	Delivery Date	Description
Key Engagement/Participation Meeting	Q1	OC/SIKIC Scoping Kick-off Workshop(s)
Key Engagement/Participation Meeting	Q1	Technical workshop on Surface Water Quality and Quantity
Other (Describe in Description Section)	Q1	Draft table of contents, format outline and key messages for OC review by June 30
Condition of Environment Report	Q2	Hard copy SoE Report due to OC on Sept 30

15.0 Project Team & Partners

In the space below please provide information on the following:

- Describe key members of the project team, including roles, responsibilities and expertise relevant to the proposed project.
- Describe the competency of this team to complete the project.
- Identify any personnel or expertise gaps for successful completion of the project relative to the OSM Program mandate and discuss how these gaps will be addressed.
- Describe the project management approach and the management structure.

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The key approach to the SoE development is to leverage the capacity of various stakeholders within the OSM governance structure. In particular, a governance structure (OC/SIKIC) workshop (or series of workshops as required) is recommended in April to develop direction and guidance on the SoE reporting work plan, discuss the approach to including indicators, data visualization and statistical approaches, along with identifying participants for the theme-specific workshops, and outlining a decision-making process for the SoE system.

A SoE Project Team is proposed to work closely with the governance structure (including the Data TAC) to help deliver consensus-based SoE reporting. Key members of the project team are the OSM Science Program Advisor (Amelie Litalien) and the Science Program Manager (Dr. Patrick Laceby). Additional staff from ECCC (i.e., Jean-Francois Bibeault), EPA (e.g., Rod Hazelwinkel), and elsewhere will be approached, as needed, to be included on a SoE Project Team that will strive to provide the leadership on data preparation, coordinate components in the analytical toolkit behind the API, provide feedback and guidance on the API development, and work closely with the governance structure on SoE development. The SoE Project Team will also guide/lead the write-up of the text-based SoE report. Of note, the SoE Project Team members will all be expected to contribute extensively to the development of all SoE products, and inclusion on the team will involve a significant commitment of time. In addition, hiring of external expertise is recommended where critical gaps exist (TBD).

Dr. Patrick Laceby has experience with SoE reporting from participating in Alberta's Office of the Chief Scientists' Condition of the Environment reporting and also the redesign of the statistical foundation and reporting for Alberta's Surface Water Quality Framework program. Additionally he has experience directing the development of a water quality dashboard with similar interoperability as the SoE API proposed in this work plan. The hiring of the Science Program Advisor is in progress, and a key component in this hiring process, will be their capacity to lead this work plan. Key gaps amongst the core project management would be potentially a Science Program Data Analyst/Engineer to support the API development on the coding side or potentially a consultant to provide this service from the API host provider and/or a consultant to help improve the end-user experience to ensure the API is accessible to an audience with diverse backgrounds/contexts. Potentially during the second half of the first year, there may be merit in having support for the API development in both the OSM branch and with the host service provider to ensure the deadlines for key deliverables are met.

One major deliverable of the work plan is several workshops and meetings. These workshops will require hosting/support from the University of Calgary and also from Program Office staff to help coordinate/ schedule/organize the meetings, with support/funding for these workshops included in the ADM-1 work plan.

A second major component is integration of the web-based API/SoE reporting with the thematic areas to ensure best-practices are followed and priority indicators are effectively included. In particular, there is a significant component of work involved in preparing the data to be included in the API, including examining the number of potential sites, the quality of the data, the length of record, changes in analytical methods or detection limits, or even minor changes in site names, locations, etc. Data preparation is an intensive process that ideally will rely upon several EPA/ECCC staff from the thematic areas. Deputy Director for OSMP (Anna Curtner) will assure key connections are made to relevant ECCC scientists and data experts. ECCC and EPA are both committed to ensuring the appropriate resources are available to ensure the effective integration of OSM Program monitoring data into the SoE reporting system while contributing to the development of the overall approach of the SoE as well as the data and reports/ web pages it generates.

As recognized by the OSM Governance structure, SoE reporting is a key priority for multiple project partners, who have the common objective of ensuring that the final product meets everyone's needs.

Monthly meetings of the SoE Project Team, including SMEs and other scientists/analysts where required to support the SoE will be established to help drive the SoE development. In particular, the monthly meetings will help keep momentum moving towards shared objectives and deliverables, including preparing for the workshops. Sub-committees/increased meeting frequency may be warranted for specific topics or at key development junctures. Critically, the SoE Project Team will engage regularly with the governance structure to report on progress and to seek additional advice, direction and guidance.

16.0 Project Human Resources & Financing

Section 16.1 Human Resource Estimates

Building off of the competencies listed in the previous section, please complete the table below. Add additional rows as necessary. This table must include **ALL staff involved** in the project, their role and the % of that staff's time allocated to this work plan. The AEPA calculated amount is based on an estimate of $120,000/year for FTEs. This number cannot be changed. The OSM program recognizes that this is an estimate.

Table 16.1.1 AEPA

Add an additional AEPA Staff member by clicking on the add row below the table. The total FTE (Full Time Equivalent) is Auto Summed (in Table 16.2.1) and converted to a dollar amount.

Name (Last, First)	Role	%Time Allocated to Project
Amelie Litalien, Science Program Advisor	Lead, Coordinate, Organize, Statistical Development, Writing	50
Pat Laceby, Science Program Manager (in kind)	Lead, Coordinate, Organize, Statistical Support/Guideance, Writing	
Rod Hazewinkel	SME support and guidance with Adaptive Monitoring expertise	50
EPA Oil Sands Data Expertise (time documented in other work plans)	Data preparation and statistical analyses	
EPA Surface Water, Groundwater, Air Technical Expertise (time documented in other work plans)	Provide SME guidance/support on data preparation and statistical analyses	

Table 16.1.2 ECCC

Add an additional ECCC Staff member by clicking on the add row below the table. The total FTE (Full Time Equivalent) is Auto Summed (in Table 16.2.2) and converted to a dollar amount.

Name (Last, First)	Role	%Time Allocated to Project
Jean-Francois Bibeault, ECCC SoE Coordination and Steering Committee Member (20% inkind)	Lead, Coordinate, Organize, Support, etc.	20
ECCC Oil Sands Data and Technology Expertise	Provide support and expertise on data preparation and statistical analyses	50
ECCC Surface Water, Groundwater, Air Technical Expertise (likely split between multiple SMEs)	Provide SME on data preparation, statistical analyses	50

The tables below are the financial tables for Alberta Environment & Protected Areas (AEPA) and Environment & Climate Change Canada. All work plans under the OSM Program require either a government lead or a government coordinator.

Section 16.2 Financing

The OSM Program recognizes that many of these submissions are a result of joint effort and monitoring initiatives. A detailed "PROJECT FINANCE BREAKDOWN" must be provided using the Project Finance Breakdown Template provided, accessible here. Please note that completion of this Project Finance Breakdown Template is mandatory and must be submitted along with each workplan.

PROJECT FINANCE BREAKDOWN TEMPLATE

Table 16.2.1 Funding Requested BY ALBERTA ENVIRONMENT & PROTECTED AREAS

Organization - Alberta Environment & Protected Areas ONLY	Total % time allocated to project for AEPA staff	Total Funding Requested from OSM
Salaries and Benefits (Calculated from Table 16.1.1 above)	100	$120,000.00
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Project-related travel		
Engagement		
Reporting		
Overhead		
Total All Grants (Calculated from Table 16.4 below)		$0.00

Total All Contracts (Calculated from Table 16.5 below)	$100,000.00
Sub-Total (Calculated)	$220,000.00
Capital*	
AEPA TOTAL (Calculated)	$220,000.00

* The Government of Alberta Financial Policies (*Policy # A600*) requires that all **capital asset** purchases comply with governmental and departmental legislation, policies, procedures, directives and guidelines. **Capital assets** (*Financial Policy # A100*, Government of Alberta, January 2014) are tangible assets that: have economic life greater than one year; are acquired, constructed, or developed for use on a continuing basis; are not held for sale in ordinary course of operations; are recorded and tracked centrally; have a cost greater than $5,000.
Some **examples of capital asset equipment include:** laboratory equipment, appliances, boats, motors, field equipment, ATV's/snowmobiles, stationary equipment (pier/sign/weather), fire/safety equipment, pumps/tanks, heavy equipment, irrigation systems, furniture, trailers, vehicles, etc. (*Financial Policy # A100*, Government of Alberta, January 2014).

Table 16.2.2 Funding Requested BY ENVIRONMENT & CLIMATE CHANGE CANADA

Organization - Environment & Climate Change Canada ONLY	Total % time allocated to project for ECCC staff	Total Funding Requested from OSM
Salaries and Benefits FTE (Please manually provide the number in the space below)	100	$218,313.00
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Project-related travel		$25,000.00
Engagement		
Reporting		
Overhead		$20,525.00
ECCC TOTAL (Calculated)		$263,838.00

* ECCC cannot request capital under the OSM program. Any capital requirements to support long-term monitoring under the OSM program should be procured by Alberta and captured in that budget table.

Table 16.3

Complete ONE table per Grant recipient.

Add a Recipient by clicking on add table below the table. The total of all Grants is Auto Summed in Table 16.2.1

GRANT RECIPIENT - ONLY: Name	
GRANT RECIPIENT - ONLY: Organization	
Category	Total Funding Requested from OSM
Salaries and Benefits FTE	
Operations and Maintenance	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
GRANT TOTAL (Calculated)	$0.00

Table 16.4

Complete ONE table per Contract recipient.

Add a Recipient by clicking on add row below the table.. This section is only to be completed should the applicant intend to contract components or stages of the project out to external organizations. The total of all Contracts is Auto Summed in Table 16.2.1

CONTRACT RECIPIENT - ONLY: Name	Data Integration and Visualization consultants (hard-copy formatting/ graphics)
CONTRACT RECIPIENT - ONLY: Organization	TBD (Total $100K including overhead)
Category	Total Funding Requested from OSM
Salaries and Benefits	$100,000.00
Operations and Maintenance	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
CONTRACT TOTAL (Calculated)	$100,000.00
CONTRACT RECIPIENT - ONLY: Name	
CONTRACT RECIPIENT - ONLY: Organization	
Category	Total Funding Requested from OSM
Salaries and Benefits	
Operations and Maintenance	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
CONTRACT TOTAL (Calculated)	$0.00

Table 16.5 GRAND TOTAL Project Funding Requested from OSM Program

The table below is auto calculated, please do not try to manually manipulate these contents.

Category	Total Funding Requested from OSM
Salaries and Benefits Sums totals for salaries and benefits from AEPA and ECCC ONLY	$338,313.00
Operations and Maintenance	
Consumable materials and supplies Sums totals for AEPA and ECCC ONLY	$0.00
Conferences and meetings travel Sums totals for AEPA and ECCC ONLY	$0.00
Project-related travel Sums totals for AEPA and ECCC ONLY	$25,000.00
Engagement Sums totals for AEPA and ECCC ONLY	$0.00
Reporting Sums totals for AEPA and ECCC ONLY	$0.00
Overhead Sums totals for AEPA and ECCC ONLY	$20,525.00
Total All Grants (from table 16.2.1 above) **Sums totals for AEPA Tables ONLY**	$0.00
Total All Contracts (from table 16.2.1 above) **Sums totals for AEPA Tables ONLY**	$100,000.00
SUB-TOTAL (Calculated)	$483,838.00
Capital* **Sums total for AEPA**	
GRAND PROJECT TOTAL	$483,838.00

Some **examples of capital asset equipment include:** laboratory equipment, appliances, boats, motors, field equipment, ATV's/snowmobiles, stationary equipment (pier/sign/weather), fire/safety equipment, pumps/tanks, heavy equipment, irrigation systems, furniture, trailers, vehicles, etc. (*Financial Policy # A100*, Government of Alberta, January 2014).

17.0 FINANCIAL MANAGEMENT

The OSM Program reserves the right to reallocate project funding during the current fiscal year on the basis of project performance and financial overspend or underspend.

☑ Please check this box to acknowledge you have read and understand

In the space below please describe the following:

- Discuss how potential cost overruns and cost underruns will be managed.
- If this is a continuing project from last year, identify if this project was overspent or underspent in the previous year and explain why.
- Describe what risks and/or barriers may affect this project.

Cost overruns or underruns will be managed according to best practices in the OSM branch. The biggest uncertainty is regarding the potential support required by consultants for the preparation and support of the web-based API and hard-copy SoE reports.

18.0 Alternate Sources of Project Financing - In-Kind Contributions

Table 18.1 In-Kind Contributions

Add an In Kind Contribution by clicking on the table and then clicking on the add row on the bottom right side of table.

Description	Source	Equivalent Amount ($CAD)
ECCC SoE Coordination and Steering Committee Member	ECCC	$28,500.00
	TOTAL	$28,500.00

19.0 Consent & Declaration of Completion

Should your application be successful, The OSM Program reserves the right to publish this work plan application. Please check the box below to acknowledge you have read and understand:

☑ I acknowledge and understand.

Lead Applicant Name

TBD - interim Pat Laceby (AEPA Science Program Manager)

Title/Organization

Science Program Advisor (AEPA)

Signature

Patrick.Laceby Digitally signed by Patrick.Laceby Date: 2023.11.03 15:54:00 -06'00'

Government Lead / Government Coordinator Name (if different from lead applicant)

Amélie Litalien

Title/Organization

Science Advisor (AEPA-OSM Science Secretariat)

Signature

Amélie Litalien Digitally signed by Amélie Litalien Date: 2024.05.16 13:36:05 -06'00'

Please save your form and refer to the instructions page for submission link.

Program Office Use Only

Governance Review & Decision Process

this phase follows submission and triggers the Governance Review

TAC Review (Date):

ICBMAC Review (Date):

SIKIC Review (Date):

OC Review (Date):

Final Recommendations:
Decision Pool:

Notes:

Post Decision: Submission Work Plan Revisions Follow-up Process

This phase will only be implemented if the final recommendation requires revisions and follow-up from governance

ICBMAC Review (Date):

SIKIC Review (Date):

OC Review (Date):

Comments:
Decision Pool:

Notes & Additional Actions for Successful Work Plan Implementation:

Signature