

## Work Plan Application

Project Information	
<b>Project Title:</b>	Fort McKay Community Dust Monitoring
<b>Lead Applicant, Organization, or Community:</b>	Ryan Abel, Fort McKay First Nation
<b>Work Plan Identifier Number:</b> If this is an on-going project please fill the identifier number for 24/25 fiscal by adjusting the last four digits: <b>Example:</b> D-1-2425 would become D-1- <b>2425</b>	202425_wkpln_FortMcKayCommunityDustMonitoring_AbelRyan
<b>Project Region(s):</b>	Athabasca
<b>Project Start Year:</b> First year funding under the OSM program was received for this project (if applicable)	2022
<b>Project End Year:</b> Last year funding under the OSM program is requested <b>Example: 2024</b>	2026 based on requested extension
<b>Total 2024/25 Project Budget:</b> From all sources for the 2024/25 fiscal year	\$125,613.00
<b>Requested OSM Program Funding:</b> For the 2024/25 fiscal year	\$125,613.00
<b>Project Type:</b>	Community Based Monitoring
<b>Project Theme:</b>	Air & Deposition
<b>Anticipated Total Duration of Projects (Core and Focused Study (3 years))</b>	Year 4
<b>Current Year (choose one):</b>	Focused Study -Select One-
	Core Monitoring -Select One-

**Contact Information**

<b>Lead Applicant/ Principal Investigator:</b> Every work plan application requires one lead applicant. This lead is accountable for the entire work plan and all deliverables.	Ryan Abel
<b>Job Title:</b>	Senior Manager, Environment & Regulatory Affairs
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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**.

This dust monitoring program is the result of ongoing dust related issues in the community and the absence of any dustfall monitoring in the community and region despite oil sands mining operations being major dust emitters and there being an Alberta Ambient Air Quality Guideline (AAAQG) for dustfall. The project is intended to collect dustfall and dustfall related data to identify the dust source types and dust source locations contributing to dustfall in Fort McKay; and compare the dustfall levels in Fort McKay relative to dustfall criteria/limits in Alberta and other jurisdictions.

Project deliverables include:

- i) monthly dustfall measurements at a number of community and Traditional Territory locations;
- ii) continuous total suspended solids (TSP) data at AMS 1;
- iii) time-integrated TSP mass, ion and elemental data at AMS 1;
- iv) a review and summary of literature and information on dustfall measurement and criteria with an emphasis on information that could help define/establish acceptable dustfall levels in Fort McKay; and
- v) an analysis, using dustfall characterization data, that will provide information on the dust source types, meteorological factors influencing dust levels and dust source locations that are most relevant in terms of dustfall levels in the community and FMFN's Traditional Territory.

The project fulfills a number of OSM monitoring objectives:

- i) it monitors an "indicator" i.e. dustfall, which is of significant relevance to the community with monitored conducted by an individual that lives in the community;
- ii) it focuses on a recognized but poorly documented or quantified oil sands impact i.e. dust; and
- iii) it provides dust characterization data that can be linked to current core meteorological and air quality monitoring data to better understand the possible location(s) and specific source type(s) contributing to dust in the community which will inform management and regulatory action.

## 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.

Until this project there had never been any dustfall monitoring in Fort McKay despite frequent complaints regarding dust levels in the community and despite the fact that Alberta has an Ambient Air Quality Guideline (AAAQG) for dustfall. This project is intended to quantify dustfall levels in Fort McKay relative to the AAAQG for dustfall and TSP levels relative to the AAAQO for TSP. This project will provide current dustfall levels in Fort McKay, and in parts of its Traditional Territory, which will serve as a current baseline and inform discussion on limits of change for dustfall from a nuisance perspective. These limits of change will clearly be below current dustfall levels. PM10 can represent a significant fraction of dust and monitoring associated with this project, in conjunction with PM monitoring already being conducted by WBEA, can be used to estimate the contribution of dust to PM10 levels in Fort McKay. The WHO has ambient air quality health-based guidelines for PM10 and therefore this project will also assist in setting a limit of change for dust from a health standpoint.

Data from the project will assist in the "examination of cause" in terms of the location and source type(s) contributing the dustfall levels in Fort McKay in the community. This directly relates to the source-pathway-receptor model used by the OSM.

The project directly links to a number of the Air TAC scope of work questions/issues trying to be addressed; Specifically:

- Provide ambient concentrations to help understand the impact of multiple sources on air quality in the Oil Sands region, including the ability to distinguish between oil sands specific sources of emissions and emissions from other natural and anthropogenic sources (Note: while not implemented in 2023/24, it is hoped that the requested additional year of monitoring under this project will be approved and that the planned dustfall monitoring at Fort McKay's Namur Lake AMS can be implemented and provide an indication of natural background dustfall levels in the Region. Also, WBEA's dustfall monitoring at Anzac, Janvier and Conklin can be used to provide an indication on non-oil sands mining affected dustfall levels in the region.)
- Has air quality changed from baseline(s)?
- Are there effects on receiving environment (endpoints relating to ecological health, odours, human health, endpoints relating to Indigenous rights: wellbeing, culture and rights)?
- What are regional sources of dust in air?
- What are the pathways and fate of particulate matter?
- How do management of particulate matter emission sources affect air quality?

As noted previously, this project, and the parallel WBEA dustfall monitoring, are the first dustfall monitoring programs undertaken in the Region so there are no previous/existing datasets against which the data from this project can be compared. There are, however, continuous and time-integrated measurements being made in Fort McKay that, in conjunction with data from this project, can be used to assess how significant PM fractions greater than 10um in aerodynamic diameter are in terms of dustfall.

## 2.0 Objectives of the Work Plan

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

The Fort McKay Community Dust Monitoring Program objectives for 2024-2025 are as follows (note: these objectives are based on approval of the request for a 1-year extension of the project):

1. Continue to execute the dustfall monitoring program in Fort Mckay, and at select locations throughout its Traditional Territory, as established in 2023-2024 and which involves:
  - monthly retrieval of dustfall samples and sending samples through WBEA to the Airzone One lab in Ontario for soluble and insoluble mass analysis, then with the filter from the insoluble mass analysis sent to the DRI lab in Nevada for ion and elemental analysis;
  - continuous monitoring of TSP at AMS 1;
  - monthly collection of a filter sample for the continuous TSP monitor for mass, ion and elemental analysis by WBEA;
  - every six day 24-hr time-integrated TSP partisol filter sample with mass, ion and elemental analysis conducted by WBEA;
2. Developing and applying source apportionment and source location analysis methods based on the data generated by the project in conjunction with related core monitoring data conducted by WBEA.
3. Preparing an interim project report to summarize lab results and findings from the 2022-23 and 2023-24 program years, including ion and elemental analysis of archived samples from early phase of the sampling program.
4. Presentation of interim findings to community members.
5. Plan and prepare 2025-2026 work plan to prepare final reports and other deliverables to OSM based on results and learnings from Year 2022/23-through 2024/25.

### 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.

### Themes

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

- Air                       Groundwater                       Surface Water                       Wetland
- Terrestrial                       Cross-Cutting

### 3.3.4 Air Themes

#### 3.3.4.1 Sub Themes

Quality

#### 3.3.4.2 Air & Deposition - Key Questions:

Explain how your air & deposition monitoring program addresses the key questions below.

Has baseline been established? Have thresholds or limits of change been identified?

No

Are changes occurring in air quality? If yes, is there evidence that the observed change is attributable to oil sands development? (Describe source-pathway-receptor and/or conceptual models) and what is the contribution in the context of cumulative effects?

Dust levels in the community are a function of both emissions and meteorology. Source attribution analysis have clearly indicated that oil sands mining operations are a significant contributor to coarse particulate matter in Fort McKay. Visual observations by the Fort McKay Sustainable Department have clearly shown that during windy periods there are often large clouds of dust impacting the community. Many residents of Fort McKay report that in recent years dust levels in the community have increased. However, without direct dustfall measurements there is no way to determine the magnitude and possible trends in dustfall in the community. This project is providing both quantitative dustfall data and also, through the addition TSP monitoring and characterization, providing data that can be used conduct source-pathway-receptor dust analysis.

Are there unanticipated results in the data? If yes, is there need for investigation of cause studies?

The unanticipated result is that it was expected that the magnitude of the dustfall levels measured in the community are much higher than what was expected. The sources of these high dustfall and the meteorological factors in Fort McKay need to be studied further and which require a longer term dataset to fully address.

Are changes in air quality informing Indigenous key questions and concerns?

Yes. Dust is a key quality of life issue for community members.

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

Yes. All dustfall data collected as part of this project is being provided to WBEA and is being incorporated into WBEA's data management and reporting system.

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?

As noted, there are numerous linkages between this project's monitoring and the dustfall and particulate monitoring being conducted by WBEA. Also, since dustfall can have a number of terrestrial impacts related to acid deposition, alkalization, eutrophication, photosynthesis etc. the results from this project will help inform other themes that are considering these types of issues. Since all the oil sands mining operations are within Fort McKay's Traditional Territory, and the community of Fort McKay is surrounded by oil sands mining operations, it is the community most affected by oil sands' mining dust emissions. The project is therefore somewhat standalone from an "other communities" perspective but the dustfall monitoring currently underway in other communities (undertaken by WBEA), combined with the dustfall monitoring from this study, can be used to compare dustfall levels between communities and provide an overall regional perspective on oil sands development impacts on dustfall levels in indigenous communities.

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?

Dust is specifically identified in the conceptual model for the OSM Program as a pressure with an air

quality pathway and associates responses.

How will this work advance understanding transition towards adaptive monitoring?

As part of the first dustfall monitoring program in the OSR, the program is responding to community concerns and issues and can therefore be considered an example of 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.

It can be used in the the “State of the Air” section of the SOE Report as part of the particulate matter section. This section is currently limited to PM2.5 data which only give a partial picture of the particulate levels in the OSR and the role that oil sands may or is playing in these levels.



#### 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.

By providing comprehensive, but time-period limited, magnitude/frequency/characteristic dustfall datasets the effectiveness of current and future fugitive dust management at oil sands mining operations can be assessed and adjusted as required.

#### 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

As a ICBM project it is directly address a long-standing issue/concern that Fort McKay has had i.e. dustfall impacts on quality of life not only in the community but throughout its Traditional Territory.

Does this project include an Integrated Community Based Monitoring Component?

Yes

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?

The Fort McKay First Nation has its own internal protocols that will be followed.

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.

Yes

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.

The Fort McKay First Nation will follow its own internal protocols and also those of the FMMN who are partners in the project.

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

This is an Indigenous community lead project.

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

This is an Indigenous community lead project.

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

As note above, dust is a quality of life issue for the community and the community wants to better understand the magnitude of the issue from a Western Science quantitative perspective and help identify the sources contributing to this quality of life issue. The goal being to help inform actions and measures to reduce dust in the community and on the FMFN and FMMN Traditional Territories from both quality of life improvement and health risk management perspectives.

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?

The results will be reported to the community by the community members involved in the project.

## 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.

The dust monitoring program is measuring dustfall at ~15 locations in Fort McKay and its Traditional Territory. Since there is no existing or historical dustfall data in the region, monitoring data collected at Namur Lake will be used to establish a baseline for comparison against dustfall data from other locations and future dustfall collected in the community and its Traditional Territory.

Fort McKay is working in collaboration with WBEA as WBEA is implementing a similar dustfall monitoring program on a regional basis at select air monitoring stations. This regional dust monitoring is in part being driven by facility EPEA Approval conditions requiring operators to conduct dust monitoring. Dustfall at these regional locations, some of which will be closer to surface mining operations will reflect near-source dust levels. Combined with Fort McKay community based monitoring, the collaboration with WBEA will provide the information necessary to examine dust transport in the region based on the gradient established through the collective dustfall monitoring network. By examining TSP and WBEA PM10 and PM2.5 data it should be possible to identify the dust source types and dust source locations contributing to the dustfall levels in Fort McKay. Addressing these types of issues clearly falls within the Air TAC scope of work.

## 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.

This dustfall monitoring program is focused on dust in Fort McKay and its Traditional Territory which covers the region/area in which all the oil sands mines are located and therefore provides dustfall and dust impacts on air quality in the region/areas most impacted by oil sands development dust emissions.

As discussed in the previous section, the monitoring program is being executed in tandem with WBEA's dust monitoring efforts. Collectively, the overall dustfall monitoring network will provide empirical data on dust transport in the region as the monitoring sites include the Fort McKay community, Fort McKay's Traditional Territory (including Namur Lake which may be used as surrogate for baseline conditions), and select ambient air monitoring stations in the region.

## 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.

Results collected through the Fort McKay Community Dust Monitoring program are being documented and shared/reported on a quarterly basis to WBEA.

An interim Program report is being prepared and will cover the 1st year of dustfall monitoring results i.e. November 2022 to October 2023. A presentation on this 1st year of results will be prepared and delivered to community members and partners for this project (Fort McKay First Nation, Fort McKay Metis Nation, WBEA and industry) and to the Air TAC.

A final report will be prepared at the conclusion of the proposed program after the 2024-2025 monitoring year for submission in 2025/2026, assuming that the request to conduct another year of monitoring under the project is approved for 2024-25.

## 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.

The Fort McKay Community Dust Monitoring program has and will continue to seek efficiency through:

- Collaboration and technical support between FMFN, FMMN, WBEA, industry and the Air TAC;
- Shared resources with WBEA to meet laboratory analysis and sample storage needs; and
- Integration and collaboration on data analysis and project reporting with WBEA and industry to incorporate additional data collected through their mirrored dust monitoring efforts in the region.

## 10.0 Work Plan Approach/Methods

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

The following are the approaches/methods outlined in the 2022-2023 and 2023-2024 Work Plans and the status of these in the context of these Work Plan.

Phase 1: Review established methodologies (ASTM D1739 and BC SOP-05c) and develop detailed design for dustfall bucket sampler and stand. (complete)

Phase 2: Fabricate (by WBEA) dustfall bucket samplers and stands. (complete)

Phase 3: Install dustfall bucket samplers and stands at approximately 10-15 sites (8 within Fort McKay, duplicate sampling at AMS1 (managed by WBEA), 2 at Fort McKay's Industrial Park, 2 on a community member's trapline near the Imperial Kearsy Lake project and 1 at Namur Lake AMS (note: due to a number of logistical issues dustfall monitoring at the Namur Lake site has yet to be implemented and is scheduled for 2024/25 if a 1-yr project extension is granted. (Complete except for 1 location)

Phase 4: Acquire and install a continuous measurement Total Suspended Particulate Matter (TSP) monitor at AMS1 with assistance from WBEA. (Complete with a 3 month evaluation step planned for the 3/4Q in 2023/24 to determine the reliability and usefulness of the data generated by this monitor since there are a number of challenges in measuring TSP continuously. This evaluation will be done in collaboration w/WBEA who are operating and maintaining the instrument)

Phase 5: Acquire and install a time integrated Total Suspended Particulate Matter (TSP) monitor at AMS1 with assistance from WBEA. (complete but, as for the continuous TSP monitoring, after 3 months of data are collected from this monitor an evaluation will be made to determine the reliability and usefulness of the data generated by this monitor)

Phase 6: Arrange for mass, ion and elemental analysis of: the 30-day continuous TSP filter sample; the insoluble filter from the dustfall mass monitoring of the dustfall sample from AMS 1; and the time-integrated TSP monitoring filters. (complete)

Note: The following phases are based on the assumption that an extension of 1-year to the above noted monitoring elements will be approved. The rationale for this requested extension is provided at the end of this section of the work plan.\*

Phase 7: Assuming that the 1-yr project extension is approved, continue the above monitoring activities in 2024/25, with possible modifications based on the noted TSP monitoring evaluations

Phase 8: Conduct quarterly reporting in conjunction with WBEA on dustfall monitoring results and trends analysis with correlations to the currently collected relevant continuous and semi-continuous PM2.5, PM10 data (and TSP data at AMS1 once data is available). (This is being done for dustfall mass data but will commence once there is 3 months of data from the current continuous and time-integrated TSP monitors i.e. the 3/4Q of 2023/24.)

Phase 9: Regular check-ins and lessons learned sessions held between FMFN and WBEA, to review monitoring data and resolve operational/logistic issues as they arise, and discuss possible monitoring program adjustments for Year 2024-2025 (this is an ongoing element of the program).

Phase 10: Conduct data analysis of community dust monitoring results. Analyze for relationships with dust monitoring data obtained by WBEA and industry, meteorology, and air quality and other forms of monitoring by WBEA and ECCC (PM2.5, PM10, TSP, particle counting, etc.). (Will commence once data from the continuous and semi-continuous TSP data at AMS1 is available i.e. 3/4Q of 2023/24)

Phase 11: Interim and final report preparation to detail project findings and recommendations.

\* Rationale for a 1-year Project Extension

- The 3-yr dust monitoring project (2-yrs of actual monitoring followed by a final report and community wrap-up meeting) was approved in May 2022.
- This project required the fabrication and installation of 30-day dustfall collectors, purchase and deployment of total suspended solids (TSP) time-integrated monitors and arrangement with different laboratories to analyze the collected samples. These project implementation elements were co-ordinate with, and in some cases through, WBEA who was also implementing a dust monitoring program at this time. The result was that the first dustfall collection started in November 2022 and continuous and time integrated dust measurement at the Fort McKay Bertha Ganter AMS, and associated ion and elemental analysis, required equipment purchase, installation and initial commissioning and data collection only started in the summer of 2023. Therefore, without an extension to the monitoring element of this project, the datasets for analysis will be limited.
- The monthly dustfall monitoring in Fort McKay (9 sites) has indicated that dustfall levels are generally very high. For example, the dustfall monitoring at the Fort McKay Bertha Ganter AMS is done by WBEA with duplicate sample taken. In the period Nov. 2022 to August 2023 (10 months) 7 months exceeded the Alberta Ambient Air Quality Guideline (AAAQG) for dustfall of 53 mg/100cm<sup>2</sup>/30 day Guideline for recreational/residential areas and in May the dustfall exceeded the dustfall AAAQG for commercial/ industrial of 158 mg/100cm<sup>2</sup> /30 days. The magnitude of these dustfall was unexpected despite the recognition that dustfall is an issue in Fort McKay. In order to understand the specific sources responsible for these high dustfall levels e.g. haul road dust, tailings dykes, overburden stockpiles, unpaved roads etc. requires dustfall composition data which, in conjunction with existing data on dust sources types and their composition, can be used identify the significant dust source types contributing to dustfall in the community. This type of analysis requires as large a dataset as possible and therefore another year of dustfall is considered warranted.
- The intent was to implement dustfall monitoring at Namur Lake to serve as a background dustfall monitoring site in the context of Fort McKay's Traditional Territory, this was not possible for a number of logistical reasons since this station is only accessible by helicopter. Another year of dustfall monitoring would allow baseline dustfall data to be collected at this site.
- The impact of fugitive industrial emissions on air quality (PM<sub>10</sub> and TSP) and dustfall in Fort McKay is very strongly influenced by meteorology, e.g. prevailing winds, wind speeds, temperature and precipitation (rain and snow) and these meteorological factors can vary significantly seasonally and from year to year. These means that dustfall levels in the community can vary significantly seasonally and year to year with no change in actual dust emissions. Therefore this dustfall project is very much synoptic in nature and an additional year, or even two, of dustfall monitoring would help better understand the influence of these temporal variability factors on dustfall in the community.
- PM<sub>2.5</sub> levels in the region was strongly influenced by wildfire activities in 2023, therefore the PM<sub>2.5</sub>/PM<sub>10</sub> ratio which serves as an indicator for dustfall event, along with elemental composition of PM fractions are likely influenced by wildfire activities.

## Conclusion

Based on the above considerations and factors, and on the basis that the project to date has clearly demonstrated that dustfall levels in the community are very high, approval for an additional year for odour monitoring is being requested. The implications of this request are that the project's 2024/25 budget request is similar to the 2023/24 budget request and the 2025/26 budget estimate is similar to the current 2024/25 budget estimate.

Describe how changes in environmental Condition will be assessed

The measured dustfall rates at the project's monitoring sites will be compared to the dustfall rates measured by WBEA to assess how dustfall levels are being influenced by oil sands sands mining operations. The project's dustfall and TSP measurements will also be compared to the AAAQG for dustfall, the AAAQOs for TSP and dustfall criteria in other jurisdictions to assess the potential magnitude and acceptability changes in dustfall that can reasonably be attributed to oil sands mining activities.

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

Yes. The AAAQGs for dustfall and the AAAQOs for TSP.

(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

Dustfall rates are being measured using custom-built bucket samplers designed and constructed based on existing established (i.e. ASTM) dustfall measurement methodologies. Laboratory analysis of dust samples collected are performed by certified laboratories that follow standard procedures.

The continuous and time-integrated TSP monitoring and associated filter analyses follow standard western science protocols for this type of monitoring and analyses.

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

Dustfall mass, continuous TSP ambient air quality levels, time-integrated ambient TSP levels, ion and elemental TSP and dustfall composition

## 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.

1. Sample retrieval from the community dust monitoring sites (except Namur Lake) is conducted by a trained community member). This field technician works in collaboration with WBEA staff responsible for a mirrored dust monitoring program carried out at select air monitoring stations.
2. There are and will continue to be regular check-in and lessons learned sessions held between FMFN and WBEA.
3. Quarterly reporting in conjunction with WBEA and industry to include dustfall monitoring results and trends/correlation analyses.
4. Interim and final reports will be prepared after the first, second and third years of the monitoring program.
5. A presentation will be prepared and delivered to community members and partners after concluding 2 years of monitoring.

## 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

Project partner/integration - Wood Buffalo Environmental Association (WBEA)  
Project support - Fort McKay Metis Nation  
Technical support - Air quality consultants to Fort McKay

\*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? \*

Yes

13.2 Type of Quantitative Data Variables:

Both

13.3 Frequency of Collection:

Other

13.4 Estimated Data Collection Start Date:

November 2022

13.5 Estimated Data Collection End Date:

March 2025

13.6 Estimated Timeline For Upload Start Date:

February 2023

13.7 Estimated Timeline For Upload End Date:

June 2025

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

Yes

**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
Monthly Dustfall Mass Measurements	Website	xlsx	Open by Default
Continuous TSP ambient levels	Website	xlsx	Open by Default
Time-integrated TSP mass, ion and elemental data	Website	xlsx	Open by Default
Dustfall and TSP monthly ion and elemental data	Database	xlsx	Protected 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
Technical Report	Q1	This interim technical report will be provided in Q1 2025/26
Technical Report	Q1	This dustfall measurement and criteria literature and information will be provided in Q1 2024/25
Technical Report	Q3	This final technical report will be provided in Q3 of 2025/26

## 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.

### Project Team and Partners

#### Project Lead (Fort McKay First Nation) - Ryan Abel

Ryan is the Senior Manager of Environmental & Regulatory Affairs with the Fort McKay First Nation and a member of the WBEA Governance Committee. Ryan spends much of his time protecting the ability of the FMFN to exercise their rights and practice traditional land use through the development of environmental mitigation and environmental agreements with companies looking to operate in Fort McKay's Traditional Territory. His project role includes:

- leading the Fort McKay Community Dust Monitoring Program
- managing recruitment of and provide support to Field Technician(s) (community member(s))
- coordinating training, lessons learned sessions, and monitoring activities
- engaging with FMFN community members
- liaising with OSM program administrator and project partners
- general project management and administration

#### Project Partner Representative (Fort McKay Metis Nation) - Adi Isaac Adiele whose project role includes:

- engaging with FMMN community members
- providing project coordination and support on an as-needed basis

#### Project Partner Representative (WBEA) - Sanjay Prasad whose project role includes:

- facilitating community dust monitoring integration/collaboration with WBEA dust monitoring efforts
- facilitating the design, fabrication, and installation of dustfall samplers at Fort McKay community and Traditional Territory monitoring sites
- facilitating the receiving, storage, shipping and laboratory analysis of dustfall samples collected by Fort McKay using third-party laboratories (AirZone One, DRI, Trent University)
- providing technical guidance with respect to dustfall, PM10 and TSP monitoring
- providing input towards logistical and technical issues resolution for the monitoring program
- providing support with the installation and maintenance of partisol TSP and eSampler TSP sampling, as well as operation of continuous TSP monitoring at AMS1
- providing laboratory elemental analysis of TSP samples collected at AMS1

#### Field Technician (Community Member) - Ryan Grandjambe whose project role includes:

- conducting monthly dustfall sample retrieval and delivery to WBEA laboratory
- participating in training and lessons learned sessions
- providing input into project reporting

#### Senior Air Quality Consultant - David Spink, M.Sc., P.Eng.

- provide recommendation on dustfall monitoring sampler and network design, fabrication and installation
- support program lessons learned sessions and provide guidance on program adjustment on an as-needed basis
- conduct senior review of data analysis and project quarterly/interim/final reports
- provide guidance on and conduct senior review of literature/information review on dustfall measurement and criteria in other jurisdictions
- support community presentation of interim results

#### Air Quality Consultant - Danlin Su, M.Eng., P.Eng. whose project role includes:

- supporting dustfall monitoring sampler and network design, fabrication, and installation
- supporting program lessons learned sessions and provide guidance on program adjustment on an as-needed basis
- conducting data validation and analysis
- preparing project quarterly/interim/final reports
- conducting literature/information review on dustfall measurement and criteria in other jurisdictions
- support community presentation of interim results

Air Quality Scientist (University of Toronto Associate Professor)- Jeff Brook, Ph.D. whose project role includes:

- providing advice on possible dustfall and ambient air quality PM data analyses approaches
- assisting as required in conducting some of this analysis
- reviewing/assisting in the preparation of quarterly and annual reports
- liaising with WBEA’s science advisors on data analysis approaches

Professor, School of the Environment, Trent University - Shaun Watmough, BSc., Ph.D.

- provide Sr isotope laboratory analysis on dustfall samples
- assist in data interpretation and dustfall source attribution

## 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

**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

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)	0	\$0.00
<b>Operations and Maintenance</b>		
<b>Consumable materials and supplies</b>		
<b>Conferences and meetings travel</b>		
<b>Project-related travel</b>		
<b>Engagement</b>		
<b>Reporting</b>		
<b>Overhead</b>		
Total All Grants (Calculated from Table 16.4 below)		\$30,575.00
Total All Contracts (Calculated from Table 16.5 below)		\$95,038.00
Sub-Total (Calculated)		\$125,613.00
<b>Capital*</b>		
AEPA TOTAL (Calculated)		\$125,613.00

\* 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)	0	\$0.00
<b>Operations and Maintenance</b>		
Consumable materials and supplies		
Conferences and meetings travel		
Project-related travel		
Engagement		
Reporting		
Overhead		
ECCC TOTAL (Calculated)		\$0.00

\* 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	Ryan Abel
GRANT RECIPIENT - ONLY: Organization	Fort McKay First Nation
Category	Total Funding Requested from OSM
Salaries and Benefits FTE	\$29,575.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies	\$1,000.00
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
GRANT TOTAL (Calculated)	\$30,575.00

**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	Sanjay Prasad
CONTRACT RECIPIENT - ONLY: Organization	Wood Buffalo Environmental Association
Category	Total Funding Requested from OSM
Salaries and Benefits	\$21,608.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	\$22,905.00
CONTRACT TOTAL (Calculated)	\$44,513.00
CONTRACT RECIPIENT - ONLY: Name	Shaun Watmough
CONTRACT RECIPIENT - ONLY: Organization	Trent University
Category	Total Funding Requested from OSM
Salaries and Benefits	
<b>Operations and Maintenance</b>	
Consumable materials and supplies	\$3,000.00
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
CONTRACT TOTAL (Calculated)	\$3,000.00
CONTRACT RECIPIENT - ONLY: Name	David Spink



CONTRACT RECIPIENT - ONLY: Organization	Pravid Environmental
Category	Total Funding Requested from OSM
Salaries and Benefits	\$11,725.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies	
Conferences and meetings travel	\$1,200.00
Project-related travel	
Engagement	
Reporting	\$1,750.00
Overhead	
CONTRACT TOTAL (Calculated)	\$14,675.00
CONTRACT RECIPIENT - ONLY: Name	Danlin Su
CONTRACT RECIPIENT - ONLY: Organization	Emerald Environmental
Category	Total Funding Requested from OSM
Salaries and Benefits	\$13,300.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies	
Conferences and meetings travel	\$1,200.00
Project-related travel	
Engagement	
Reporting	\$4,200.00
Overhead	
CONTRACT TOTAL (Calculated)	\$18,700.00
CONTRACT RECIPIENT - ONLY: Name	Jeff Brook
CONTRACT RECIPIENT - ONLY: Organization	University of Toronto
Category	Total Funding Requested from OSM
Salaries and Benefits	\$11,725.00
<b>Operations and Maintenance</b>	

Consumable materials and supplies	
Conferences and meetings travel	\$1,550.00
Project-related travel	
Engagement	
Reporting	\$875.00
Overhead	
CONTRACT TOTAL (Calculated)	\$14,150.00

**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	\$0.00
<b>Operations and Maintenance</b>	
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	\$0.00
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	\$0.00
Total All Grants (from table 16.2.1 above) <b>Sums totals for AEPA Tables ONLY</b>	\$30,575.00
Total All Contracts (from table 16.2.1 above) <b>Sums totals for AEPA Tables ONLY</b>	\$95,038.00
SUB-TOTAL (Calculated)	\$125,613.00
Capital* <b>Sums total for AEPA</b>	
<b>GRAND PROJECT TOTAL</b>	\$125,613.00

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.

**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)
<b>TOTAL</b>		<b>\$0.00</b>

**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**

Ryan Abel

**Title/Organization**

Fort McKay First Nation

**Signature**

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

**Title/Organization**

**Signature**

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

**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:**

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Signature