

2018-19 Work Plan Template

All fields with an * are mandatory

| Project Description Summary | | | Co-Chair Decision (March 8, 2018) |
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| Date * | Project/Work Plan Identifier (if applicable) | Program Type and Strategic Alignment * | Decision Pool E: Funded under single circumstance * Approved at \$5,610,000. * Workplans and deliverables are to be clarified separately for B-LTM-S-1819 and B-LTM-S-2-1819 and separately from the provincial biodiversity monitoring program * Amended workplans are to be submitted before March 31, 2018 to the Oil Sands Monitoring Secretariat. * Approval in 2018-19 does not represent a funding commitment for subsequent years * It is a requirement of funding that 2018-19 funds will be administered through a contractual agreement with contract specifications and terms to be determined by Oil Sands Monitoring leadership as coordinated by the OSM Secretariat * It is a requirement of funding that key members of the project team participate in a Biological Monitoring Integration Workshop to be informed by the Oil Sands Monitoring Secretariat. * Funding expectations: as a minimum an annual progress report is required by February 28, 2019. All publications or products resulting from this work requires acknowledgement of funding from the Oil Sands Monitoring Program and are to be provided to the Oil Sands Monitoring Secretariat for tracking and any programmatic communications purposes. Work funded through the Oil Sands Program will be available for public dissemination. |
| 22/01/2018 | ABMI pooled two projects together B-LTM-S-1-1819 and B-LTM-S-2-1819 | OSM - Long Term Monitoring | |
| Program Category * | Status * | Dept. ID | |
| Biodiversity, Land, Ecosystem Health Sciences | Existing Project | | |
| Project Leadership / Contact information | | | |
| Project Title * | Key Words (max 10) * | | |
| Status and Trends of Biodiversity and Human Footprint in the Oil Sands Region | Monitoring, Reporting, Biodiversity, Trend, Cause-effect, Human Footprint, Disturbance, | | |
| Surname * | Given Name * | Title * | |
| Loughheed | Stephen | Mr. | |
| Organization * | Department | Division | |
| Other | | | |
| Branch * | Section/Unit (if applicable) | Phone * | |
| ABMI | | 7804925766 | |
| Email * | Mailing Address | City | |
| stephen.loughheed@shaw.ca | CW 405, Biological Sciences Building University of | Edmonton | |
| Postal Code | EMSD Executive Owner (If Applicable) | | |
| T6G 2E9 | ?? | | |
| Project Information | | | |
| Project Objective(s) (Bullet Form) * | Monitor, evaluate and report on the status and trends of biotic communities and species in terrestrial and wetland ecosystems throughout all 3 oil sands deposits (Athabasca, Cold Lake, Peace River). Monitor, evaluate and report on the status and trends of landcover (Land-surface) to stressor (Human Footprint) in terrestrial and wetland ecosystems throughout all 3 oil sands deposits (Athabasca, Cold Lake, Peace River). Detect and report biotic response in relation to Oil Sands Developments | | |
| Plain Language Overview (100 words) * | The objective of this long-term OSM program is to monitor, evaluate, and report on the status and trends of biotic communities and species in terrestrial and wetland ecosystems throughout all 3 oil sands deposits (Athabasca, Cold Lake, Peace River). The program also monitors, evaluates and reports on the status and trends of landcover (Land-surface) to stressor (Human Footprint) in terrestrial and wetland ecosystems throughout all 3 oil sands deposits (Athabasca, Cold Lake, Peace River). | | |
| Project Duration * | Project Original Start Date * | Estimated Completion Date * | |
| Multi-Year | 2007 | 2028 | |
| Specify Objectives This Project Will Address in 2018/2019. * | 1. Establish baseline data for natural range of variability in species and land cover in the Oil Sands Region(s) and relevant sub-regions 2. Update reference conditions for species and land cover in the Oil Sands Region(s) and relevant sub-regions 3. Determine the status of hundreds of species (spatial distribution and habitat associations) and the status of land cover (amount and distribution of each cover type) in the Oil Sands Region(s) and relevant sub-regions 4. Assess the trend in species (preliminary) and land cover in the Oil Sands Region(s) and relevant sub-regions 5. Determine if the change in species and land cover in the Oil Sands Region(s) and relevant sub-regions is consistent through time 6. Determine if species and land cover change in the Oil Sands Region(s), and relevant sub-regions, is ecologically meaningful or relevant to management 7. Assess the relationship between species and land cover change and natural/anthropogenic drivers. 8. Measure what proportion of the species and land cover change that is associated with individual or multiple anthropogenic and natural drivers in the Oil Sands Region 9. Determine if multiple anthropogenic drivers are having an additive or synergistic effect on species and land cover in the Oil Sands Region(s) and relevant sub-regions 10. Determine if the effect of anthropogenic driver(s) on species and land cover be completely isolated with existing data 11. Assess the predicted future effects of single disturbances and cumulative development on species and land cover 12. Determine if human development is affecting common land cover types differently than rare land cover types | | |
| Specify Objectives This Project Will Address Beyond 2018/19 (if multi-year). * | 1. Establish baseline data for natural range of variability in species and land cover in the Oil Sands Region(s) and relevant sub-regions 2. Update reference conditions for species and land cover in the Oil Sands Region(s) and relevant sub-regions 3. Determine the status of hundreds of species (spatial distribution and habitat associations) and the | | |
| List Key Questions/Hypotheses Related to Each Objective Stated Above. * | 1. What is the natural range of variability for species and land cover in the Oil Sands Region(s) and relevant sub-regions? 2. What is the reference condition for species and land cover in the Oil Sands Region(s) and relevant sub-regions? 3. What is the status of species (spatial distribution and habitat associations) and status of land cover | | |

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| Main Assumptions, Constraints, Dependencies. * | | |
| <p>1. The Government of Alberta will continue to support the ABMI with in-kind support in the form of spatial base features information (maps of anthropogenic features) and remote-sensing imagery.</p> <p>2. Funding will be made available in a timely manner.</p> <p>3. Our key delivery partners continue to support this program area including InnoTech Alberta (formerly Alberta Innovates Technology Futures), The Government of Alberta (Royal Alberta</p> | | |
| Partner Categories (select all that apply) * A partner is an individual, group, agency, community etc. that is an active participant in the project and in achieving the project deliverables. | Knowledge System * | Location (select all that apply) * |
| <input type="checkbox"/> Federal Government <input checked="" type="checkbox"/> Another AEP Division <input checked="" type="checkbox"/> Another GoA Department <input checked="" type="checkbox"/> University/Academic Institution <input type="checkbox"/> Solely delivered by GoA <input type="checkbox"/> Citizen Science <input type="checkbox"/> Indigenous Community or Organization <input type="checkbox"/> ENGO <input type="checkbox"/> Other | Choose one | <input checked="" type="checkbox"/> Office or Laboratory <input checked="" type="checkbox"/> Sub-regional <input type="checkbox"/> Transboundary (provincial/territorial) <input checked="" type="checkbox"/> Lower Peace Region <input checked="" type="checkbox"/> Upper Peace Region <input checked="" type="checkbox"/> North Saskatchewan Region <input type="checkbox"/> Red Deer Region <input checked="" type="checkbox"/> Lower Athabasca Region <input type="checkbox"/> Upper Athabasca Region |
| AEP ONLY: Strategic Alignment to EMSD Outcomes | | |
| AEP ONLY: Strategic Alignment to EMSD Science Plan, select 1-2 areas that apply (if Applicable) | | |
| Choose one | | |
| Choose one | | |
| AEP ONLY: Strategic Alignment to AEP Departmental Outcomes | | |
| AEP ONLY: Environmental and Ecosystem Health and Integrity | AEP ONLY: Sustainable Economic Diversity | AEP ONLY: Social Well-Being |
| Choose one | Choose one | Choose one |
| AEP ONLY: Protected Public Health and Safety from Environmental | | |
| Choose one | | |
| AEP ONLY: IMAG/IMSC Information Needs, Please Specify Which Need(s) is Being Addressed. File location M:\EMSD\Common\Portfolio Mgmt System Shared Docs | | |
| AEP ONLY: How This Project Will Address Each Strategic Theme Selected Above. | | |
| Project Methodology | | |
| List the Key Project Phases and Provide Bullets for Each Major Task Under Each Project Phase. * | <p>1. Field data: Acquired and processed (on-grid)</p> <p>2. Field data: Acquired and processed (off-grid)</p> <p>3. Field data: Publicly released</p> <p>4. Geospatial data: Acquired, processed and publicly released (3x7 plots)</p> <p>5. Geospatial data: Acquired, processed and publicly released (wall-to-wall)</p> <p>6. Geospatial data: Publicly released</p> <p>7. Quality Assurance: Field data</p> <p>8. Quality Assurance: Geospatial data</p> <p>9. Quality Assurance: Standard Operating Procedure updates</p> <p>10. Scientific publications for submission to academic journals</p> <p>11. Additional biodiversity reporting requirements</p> <p>12. Budget reporting</p> | |
| Describe How Changes in Environmental Condition Will Be Assessed. * | <p>Monitoring Area</p> <p>The monitoring area includes all three Oil Sands Deposits (Athabasca, Cold Lake, Peace River) plus an additional area north of the Athabasca Deposit to enable full representation of the Lower Athabasca Region for regional biodiversity management framework reporting (Government of Alberta 2012).</p> | |
| Are There Benchmarks (e.g., objectives, tiers, triggers, limits, reference conditions, thresholds, etc.) Being Used to Assess Changes in Environmental Condition? If So, Please Describe, If Not, State "NONE". * | <p>Biodiversity Management Frameworks under regional Land-Use Planning for all the northern planning regions use specific objectives, tiers, triggers, limits, reference conditions, thresholds. This monitoring plan supports, in part, these biodiversity management frameworks.</p> | |
| Provide a Brief Description of the Methods By Project Phase. * | <p>1. Please see terrestrial spring and summer field data collection methodology: http://www.abmi.ca/home/publications/451-500/460.html?mode=detail&documenttype=Protocols;</p> <p>Please see wetland field data collection methodology: http://www.abmi.ca/home/publications/451-500/461.html?mode=detail&documenttype=Protocols;</p> <p>2. Remote cameras will be deployed at targeted off-grid site locations.</p> <p>3. N/A</p> <p>4. Public release via abmi.ca of geospatial (land cover and land use) data acquired and processed for 2016 conditions at 3x7 km plots as per the attached 2018-19 Monitoring Plan, following Standard Operating Procedures listed at the end of this work plan.</p> <p>Human Footprint (Landuse features):</p> <ul style="list-style-type: none"> • Mapping of an entire sample-based HF dataset (1,656 sites) for 2017 conditions to be used for trend | |

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| List the Key Indicators Measured. * | <p>For Ecosystem Health surveys, terrestrial habitat indicators include:</p> <ul style="list-style-type: none"> • % cover of water, bare soil, and low vegetation, shrubs, trees • Tree density (live, dead, down) • Soil parameters (LFH, organic, mineral) • Vascular plant diversity • Bryophyte diversity • Lichen diversity • Bird diversity • Mammal diversity • Mite diversity <p>Wetland habitat and species indicators include:</p> <ul style="list-style-type: none"> • Water chemistry, nutrient content, and isotopic signature • Wetland classes (mineral or organic) • Area covered by open water, emergent vegetation, graminoid and wooded vegetation. • % cover of water, bare soil, low vegetation, shrubs, and trees around the wetland • Area and type of natural and human created disturbance in an around the wetland • Vascular plant diversity • Aquatic invertebrate diversity <p>Focal terrestrial indicators include mammal diversity, bird diversity and vascular plant diversity. Focal wetland indicators include mammal diversity, bird diversity, and aquatic invertebrate diversity.</p> |
| Describe Sample Handling Procedures, if Not Applicable, State N/A.* | Sample handling is based on corresponding standard operating procedures, from field collection of samples to sample processing and accessioning in the Royal Alberta Museum. Please see Alberta Biodiversity Monitoring Institute QMP (2016). Chapter 3: Monitoring Centre QMP, Sections 3.2 & 3.3; Chapter 4: Processing Centre QMP, Section 4.2 & 4.3 |
| List SOPs that Will Be Used, if Not Applicable, State N/A.* | Alberta Biodiversity Monitoring Institute QMP (2016). Chapter 3: Monitoring Centre QMP, Sections 3.2 & 3.3; Chapter 4: Processing Centre QMP, Section 4.2 & 4.3; Chapter 5: Information Centre QMP; Section 5.2. Please see rows 296-309 for a list of SOPs that will be used. |
| Describe the QA/QC Plan, if Not Applicable, State N/A. * | Field data are collected by trained field staff using standardized monitoring protocols. Throughout the field season, collected specimens are shipped to the Royal Alberta Museum for processing, while field data is verified in-field by Field Coordinators and then sent to the Information Centre (IC) for post-field verification. In the IC, the data undergoes one round of data quality assessment prior to loading into the database, and then one final round of data and metadata quality assessment prior to use for analyses and public release. Upon completion of QA, this data is QC'd for use in various data products such as Intactness and reports. Please refer to the ABMI's Quality Management Plan for further information (http://www.abmi.ca/home/publications/401-450/441.html?jsessionid=7314A37513F1A630E96FAC2131E05BF4?mode=detail) |
| Describe How Indigenous Communities are Involved in the Project Design, Data Collection, and Analysis (Knowledge Co-creation) and How is their Consent Sought. If Not Applicable, State N/A.* | N/A |
| Components Delivered by Others | |
| List by Project or Project Phase Each Component That Will Be Delivered by An External Party (including analytical laboratories) and Name the Party. State None if Not Required. * | Delivery of entire program is large and involves contracts with many external parties. Some parties include Wood Buffalo Helicopters, Strix Consulting, Portage College, Dave Huggard, . For a more comprehensive of contractor please contact ABMI. Components are Grant or both. Funding to ABMI is provided via a contract for 2018-2019. |
| Will These Components be Delivered Under Grant or Contract or Both? Please Describe and Name the Associate Work Plan/Grant/Contract for These Services if Not Included Within This Work Plan. * | Components are delivered under grant or both. Funding to ABMI is provided via a contract for 2018-2019. |
| Monitoring Site Locations and Coordinates (for all sites, please add them to the Monitoring Site Location tab - a separate excel sheet) | |
| Attach Map of Locations. Distinguish Indicators by Station if Necessary. Distinguish Sampling Frequency by Station if Necessary. | Attached |
| Project Schedule | |
| FOR OIL SANDS MONITORING PROJECTS ONLY: A coordinated field monitoring schedule for the OSM Program is required. Please complete the attached document named "OSM Program Field Monitoring Schedule" in addition to this work plan. Fill as much as you can recognizing that scheduling changes will occur and the scheduling document will be updated regularly. Please note the scheduling document will be shared with stakeholders. | In 2018, 212 sites within the OSM region will be visited. This number includes Ecosystem Health sites (82 sites) and Focal sites (130 sites) sampled. Focal on-grid sites include the deployment/retrieval of cameras and ARUs at terrestrial and wetland sites, and field sampling of vascular plants at terrestrial sites and aquatic invertebrates at wetland site. All sites to be sampled can be found in the Monitoring Site Locations sheet. An additional 50 off-grid sites will also be sampled in the OSM, targeting specific habitat types to improve modeling. Site locations will be determined in early 2018. |
| FOR OIL SANDS MONITORING PROJECTS ONLY: Have You Coordinated With Other Project Leads On Field Logistics? If So, Please Specify. * | Yes - We have coordinated with Dr. Erin Bayne. |

| Other | | |
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| Additional Details. | | |
| Will Capacity Building and Training be a Component of the Project and If So, Explain How. If Not, State N/A.* | | |
| Environmental Impact and Considerations. | | |
| Data Management and Digital Assets | | |
| Will Data be Produced as a Result Of This Project? * | Type of Quantitative Data Variables | Frequency Of Collection |
| Yes | Choose one | Other |
| Data Collection Period: Start Date - End Date | Timeline For Upload Period: Start Date - End Date | |
| Is There a Data Sharing Agreement? (Yes or No). | No | |
| Will the Data Include Traditional Knowledge as Defined by and Provided by an Indigenous Representative, Community or Organization (Yes / No). | No | |
| Platform/Location of Data Storage. | www.abmi.ca | |
| Project Deliverables | | |
| Proposed 2018-19 Deliverable Type (for each deliverable outline document, presentation, meeting, etc.) | | |
| <input checked="" type="checkbox"/> Peer-reviewed Journal Publication | <input type="checkbox"/> Peer-reviewed Conference Proceeding | <input type="checkbox"/> Non-peer reviewed Conference Proceeding |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |
| | | |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| | | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| Solyms, P., E. Bayne, & J. Schieck. How does subsampling of bird recordings influence species detection? (for submission to a peer-reviewed journal). | | |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| Topic for 2nd publication to be determined at the start of the 2018-19 fiscal year (for submission to a peer-reviewed journal). March 31, 2019 | | |
| <input checked="" type="checkbox"/> Technical Report | <input type="checkbox"/> Book Chapter | <input checked="" type="checkbox"/> Public Dissemination Document |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |
| | | 2016 Human Footprint Inventory |

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| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| Monitoring Activity Report: Lower Athabasca Planning Region 2017 | | Online report "State of the Environment (Land and Biodiversity) in the Oil Sands Region of Alberta": this online report will be made available for distribution to EMSD counterparts for review and establishment of a communications protocol. • |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| | | Public release of 2017 raw field and habitat data |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| A report based: 1. Human footprint a. Finishing mapping of a wall-to-wall Human Footprint (HF) inventory for 2016 conditions and initiating mapping of a wall-to-wall Human Footprint (HF) inventory for 2017 conditions b. Incorporate recovery attributes for seismic lines into 2016 HF inventory 2. Land cover a. Finishing first visit mapping of a sample-based very detailed photo-plot Landcover (LC) dataset to be used for trend analysis | | Updates to the ABMI data portal to disseminate relationships between species abundance and industrial development.; Public release via abmi.ca of geospatial (land cover and land use) data acquired and processed for 2016 conditions at 3x7 km plots as per the attached 2018-19 Monitoring Plan; Public release via abmi.ca of geospatial (land cover and land use) data acquired and processed for the provincial extent. Web-based environmental sensor platform that integrates wildlife camera and acoustic sensor data for the entire OSR region including data collected by the ABMI, communities, researchers, wildlife managers, |
| <input checked="" type="checkbox"/> Conference Presentation(s) | <input checked="" type="checkbox"/> Stakeholder Presentation | <input checked="" type="checkbox"/> Key Engagement/Participation Meeting * |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | | |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | Presentation to AEP planning branch on monitoring results, and key field results from the North Saskatchewan, South Saskatchewan and Lower Athabasca Region as well as land cover monitoring activities. | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | | Results of Multi-stakeholder engagement process and showcase, 2018, Edmonton, end of September - beginning of October, Energy Sector, Forestry, Agriculture, Government of Alberta and Canada, Indigenous group, Municipalities, and Non-government Organizations, ~150 participants. |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| Platform | Platform | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| Alberta Chapter of the Wildlife Society General Meeting.Presentation of ABMI's 2018 monitoring results. | Presentation to COSIA/CAP on resulting OSM monitoring results for 2018 Ecosystem Health and Focal Species change detection program. This will become an annual meeting | COSIA/CAP annual meeting, 2019, TBD, TBD, COSIA and CAP |
| <input type="checkbox"/> EMSD Strategic & Operational Publication | <input checked="" type="checkbox"/> Other Documents | |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | |
| | | |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | |
| | | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | |

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| | Updates to the following standard operating procedures: • Alberta Biodiversity Monitoring Institute. 2016. Tablet data receiving, data verification and cleaning, and data loading. • Alberta Biodiversity Monitoring Institute. 2016. Field Data Quality Assessment and Control. • Alberta Biodiversity Monitoring Institute. 2011. Data Storage, Back-up, and Archiving. | |
| Q4 - Deliverable, Comments | | |
| | Updates to the following standard operating procedures: • Alberta Biodiversity Monitoring Institute. 2014. Post-Season Data Verification for Terrestrial and Wetland Protocols. • Alberta Biodiversity Monitoring Institute. 2013. In-Season Data Verification for Terrestrial and Wetland Protocols. • Alberta Biodiversity Monitoring Institute. 2017. Data Screening for Species of Management Concern. | |
| Proposed Deliverables After 2018/2019 for the project funds received in 2018/2019 | | |
| <input type="checkbox"/> Peer-reviewed Journal Publication | <input type="checkbox"/> Peer-reviewed Conference Proceeding | <input type="checkbox"/> Non-peer reviewed Conference Proceeding |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |
| | | |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| | | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| | | |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| | | |
| <input type="checkbox"/> Technical Report | <input type="checkbox"/> Book Chapter | <input type="checkbox"/> Public Dissemination Document |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |
| | | Dataset of OSR wetland reference condition: available for download on abmi.ca/data by June 30, 2019. Lease-level habitat prioritization tool; Custom reporting platform based on Elasticsearch database: available on abmi.ca/data June 20, 2019. |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| | | Updated datasets for topographic variables, hydrographic variables, and landcover classes: available for download on abmi.ca/data by June 30, 2019 |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| | | |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| | | |
| <input type="checkbox"/> Conference Presentation(s) | <input checked="" type="checkbox"/> Stakeholder Presentation | <input checked="" type="checkbox"/> Key Engagement/Participation Meeting * |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | Q1 - Deliverable, Comments |

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| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | Presentation to COSIA/CAP on resulting OSM monitoring results for 2018 Ecosystem Health and Focal Species change detection program. This will become an annual meeting | COSIA/CAP annual meeting, 2019, TBD, TBD, COSIA and CAP |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | Q2 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | Q3 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | | |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | Q4 - Deliverable, Comments |
| Choose one | Choose one | Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. |
| | | |
| <input type="checkbox"/> EMSD Strategic & Operational Publication | <input type="checkbox"/> Other Documents | |
| Q1 - Deliverable, Comments | Q1 - Deliverable, Comments | |
| | | |
| Q2 - Deliverable, Comments | Q2 - Deliverable, Comments | |
| | | |
| Q3 - Deliverable, Comments | Q3 - Deliverable, Comments | |
| | | |
| Q4 - Deliverable, Comments | Q4 - Deliverable, Comments | |
| | | |
| All Completed Products | | if a |
| multi-year project, specify all completed products to date (consistent format for the fields below). Add rows as required. | | |
| Journal Paper | | |
| Required Format: Author (follow APA citation format), Year, Title, Journal, Volume, Page Numbers, Open or Closed and Document Location | | |
| Example: Jacoby, W. G. (1994). Public Attitudes Toward Government Spending. <i>American Journal of Political Science</i> , 38(2), 336-361. | | |
| Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, Insurgency, and Civil War. <i>American Political Science Review</i> , 97(01), 75. doi: 10.1017/S0003055403000534 | | |
| 1) Van Wilgenburg, S. L., Sólymos, P., Kardynal, K. J. & Frey, M. D. (2017). Paired sampling standardizes point count data from humans and acoustic recorders. <i>Avian Conservation and Ecology</i> , 12(1), 13. doi: 10.5751/ACE-00975-120113 | | |
| 2) Nielsen, S., Bayne, E., Schieck, J., Herbers, J., and Boutin, S. 2007. A new method to estimate species and biodiversity intactness using empirically derived reference conditions. <i>Biological Conservation</i> 137:403-414. | | |
| 3) Sólymos, P., Morrison, S.F., Kariyeva, J., Schieck, J., Haughland, D., Azeria, E., Cobb, T., Hinchcliffe, R. Kittison, J., McIntosh, A., Narwani, T., Piersossi, P., Roy, M.-C., Sandybayev, T., Boutin, S., Bayne, E.M. (2015). Data and Information Management for the Monitoring of Biodiversity in Alberta. <i>Wildlife Frontiers in Ecology & the Environment</i> , 11(4), 128-129. doi: 10.1890/13.WB.010 | | |
| 4) Sólymos, P., Burton, C., Herbers, J., Boutin, S., Schieck, J. (2013). Is Accurate Location Information Necessary for Repeatability in Field-based Ecology? <i>DeMars, C.A. and S. Boutin. Nowhere to hide: the impact of linear disturbances on the spatial dynamics of predator and prey in a large mammalian system. Journal of Animal Ecology</i> , in review. | | |
| Dickie, M., Serrouya, R., DeMars, C., Cranston, J., and Boutin, S. Evaluating Functional Recovery of Habitat for Threatened Woodland Caribou. <i>Ecosphere</i> , in review. | | |
| Habib, T., Heckbert, S., Wilson, J., Vandenbroek, A., Cranston, J., Farr, D. Impact of Land-use management on ecosystem services and biodiversity: an agent-based modelling approach. In review. | | |
| Haughland, D. L., Hillman, A. & Azeria, E.T (MS). Re-evaluating <i>Cladonia rei</i> in Alberta: grassland specialist or temperate generalist? In review. | | |
| Hird, J.N., G.J. McDermid, A. Montaghi, A. McIntosh, and J. Kariyeva: Towards the use of UAVs for vegetation/reclamation surveys. <i>Remote Sensing</i> , in review. | | |

McDermid, G.J., A. Montaghi, T. McKeemain, J. Kariyeva, B.J. Moorman, and S.E. Nielsen: The Effect of Atmospheric and Illumination Conditions on Photogrammetric Point Clouds Derived from Stereo UAV Imagery. *IEEE Transactions on Geoscience and Remote Sensing*, in review.

Rahman, M., G.J. McDermid, M. Irvani, Y. He, X. Guo, and J. Kariyeva: Remote sensing of rangeland health in Alberta, Canada: an empirical comparison of satellite- and ground-based observations. *International Journal of Remote Sensing*, in review.

Serrouya, R. Kellner, Pavan, DeMars, Lewis, McLellan. Time versus distance: alternate metrics of animal resource selection provide opposing inference. *Ecosphere*, in review.

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Azeria, E.T. & Rooney, R. C. Interactive effect of disturbance gradient and regional context on cross-taxa congruence of birds, bryophytes, mites and vascular plants. Oral presentation: Ecological Society of America (ESA) 99th Annual Meeting-Sacramento, CA, August 10-15, 2014

Bayne, E., Mahon, L., Sólmos, P., Lankau, H., Ball, J., Tigner, J. (2014): Integrating uncertainty in edge effects in land-use policy (#571). North America Congress for Conservation Biology (NACCB), Missoula, Montana, July 13–16, 2014.

Castilla, G., J.N. Hird, and G.J. McDermid 2014. Visualizing and quantifying landscape change at broad spatio-temporal scales with the CAT Transform. Proceedings, International Geoscience and Remote Sensing Symposium/35th Canadian Symposium on Remote Sensing, Quebec.

Hird, J.N., G. Castilla, and I. Bueno 2014. A New Multi-Temporal Transform for the Broad-Scale Analysis and Visualization of Landscape Dynamics. Spatial Knowledge and Information, Banff, Alberta.

Scarl, J. C., Lambert, J. D., Hart, J., Dettmers, R., Sólmos, P. (2014): Ten years of mountain birdwatch: abundance and trends of Bicknell's Thrush and other high-elevation birds. Northeast/ Southeast Partners in Flight Bird Conservation Conference, 6–9 October 2014, Wyndham Virginia Beach, VA.

Schieck, J., Huggard, D., Sólmos, P. (2014): Biodiversity monitoring to assess cumulative effects: the dichotomy between targeted and surveillance monitoring unraveled (#541). North America Congress for Conservation Biology (NACCB) to be held in Missoula, Montana, July 13-16, 2014.

Sólmos, P. & MC Roy, "ABMI: Enhancing our Vision of Alberta's Biodiversity", invited talk, 2014 Workshop of the Canadian Society of Environmental Biologists (CSEB), Edmonton AB, October 3, 2014

Sólmos, P., "Data cloning: bridging the Bayesian and frequentist statistical paradigms", guest lecture, Budapest R User Group meetup, Budapest, Hungary, July 16, 2014

Sólmos, P., "Understanding the sources of biases in population size estimates based on roadside surveys in Canada", invited symposium talk, AOJ/COS/SCO Joint Meeting, Estes Park, Colorado, September 23–28, 2014

Sólmos, P., "What to do with messy data: using standardized abundance indices in species distribution modeling", invited talk, Biometry Conference (Hungarian Society for Clinical Biostatistics), Budapest, Hungary, May 16–17, 2014

Sólmos, P., Matsuoka, S., Bayne, E., Lele, S. (2014): Discussing problems vs. finding solutions: an operational framework for dealing with imperfect detection in species distribution modelling. International Statistical Ecology Conference 2014, Montpellier, France, July 1–4, 2014, p. 135.

Steenweg, R., J. Whittington, M. Hebblewhite. 2014. Power to detect trends in the occupancy of large carnivores using remote cameras in the Canadian Rockies. Society for Conservation Biology, 15 July, Missoula, MT.

Steenweg, R., J. Whittington, M. Hebblewhite. 2014. Remote cameras at large spatial scales: Multi-species interactions and carnivore trend monitoring in the Canadian Rockies. Regional Wildlife Research Symposium, 4 November, Bumthang, Bhutan.

Steenweg, R., M. Hebblewhite, J. Whittington. 2014. Using remote cameras to monitor trends in carnivore populations and to understand multi-species interactions. Edmund Mach Foundation, 21 January, San Michele All'adige Trento, Italy.

Stralberg, D., Matsuoka, S., Hamann, A., Bayne, E., Sólmos, P., Schmiegelow, F., Wang, X., Cumming, S., Song, S. (2014): Projecting boreal bird responses to climate change: the signal exceeds the noise (#270). North America Congress for Conservation Biology (NACCB), Missoula, Montana, July

Azeria, E. T. & Caners, R. Identification and modelling of species-groups of bryophytes in the boreal region using co-occurrence based biodiversity reconstruction. Poster Presentation: International Biogeography Society Special Meeting, The Geography of Species Associations, November 15-17, 2013, Banff, Alberta.

Bueno, I., J.N. Hird, G. Castilla, and G.J. McDermid. 2013. Applying a new decadal change product in the monitoring of urban expansion around Calgary, Alberta. Proceedings, 7th International Conference on the Analysis of Multi-temporal Remote Sensing Images, Banff, Alberta.

Hird, J.N., I. Bueno, R. Iwamoto, G. Castilla, and G.J. McDermid. 2013. A new MODIS product for visualizing multi-temporal regional change on a decadal scale. Proceedings, 7th International Conference on the Analysis of Multi-temporal Remote Sensing Images, Banff, Alberta.

McInnes, W., B. Smith, and G.J. McDermid. 2013. Separating herbaceous land cover in three prairie natural subregions with multi-temporal MODIS imagery. Proceedings, 7th International Conference on the Analysis of Multi-temporal Remote Sensing Images, Banff, Alberta.

Smith, B. and G.J. McDermid. 2013. Examination of fire-related plant succession within the dry mixedgrass subregion of Alberta using MODIS and LandSat imagery. Proceedings, 7th International Conference on the Analysis of Multi-temporal Remote Sensing Images, Banff, Alberta.

Sólmos, P. (2013): Statistical assumptions in the distance decay relationship and their implications for biodiversity conservation. Special Meeting of the International Biogeography Society: The Geography of Species Associations, Montréal Québec, Canada, November 15–17, 2013, p. 30.

Sólmos, P., "Complex models in ecology: challenges and solutions", invited talk, "Recent advances in R packages", session organizer: D. Murdoch, Annual Meeting of the Statistical Society of Canada, May 26–29, 2013

Sólmos, P., "Parallel computing with R", guest lecture, Edmonton R User Group meetup, Edmonton, Alberta, April 26, 2013

Steenweg, R. 2013. Carnivores and focal species in the Canadian Rockies: how remote cameras can improve their conservation. Bow Valley Naturalists Meeting, 22 January, Banff, AB.

Steenweg, R. 2013. Examining trends in carnivore populations and their prey using remote cameras. Wild Jasper Speaker Series, 21 March, Jasper, AB.

Steenweg, R. 2013. On Improving Multi-Species Occupancy Modeling Using Remote Cameras at Large Spatial Scales. Alberta Chapter and Canadian Section of The Wildlife Society, 9 March, Canmore, AB.

Steenweg, R. 2013. Using remote cameras to improve focal-species conservation. Alberta Grizzly Bear Science Advisory Committee, 30 January, Edmonton, AB.

Bayne, E., Sólmos, P., Matsuoka, S., Stralberg, D., Fontaine, T., Cumming, S., Schmiegelow, F. & Song, S. (2012): Estimating population sizes of landbirds from non-standardized point-count surveys in North America's boreal forest: making the most of a potentially messy situation. Abstract Book, 5th North American Congress for Conservation Biology, Oakland, California, July 15–18, 2012, p. 31.

Burton, C., Huggard, D., Schieck, J., Sólmos, P., Bayne, E. & Boutin, S. (2012): A framework for monitoring the cumulative effects of human footprint on biodiversity. Congress Abstracts, The Inaugural SCB North American Congress for Conservation Biology, Oakland, California, July 15–18, 2012, p. 31.

Castilla, G., A. Hernando, D. Mazumdar, and G.J. McDermid, 2012. An integrated framework for assessing the accuracy of GEOBIA land cover products. GEOBIA 2012, Rio de Janeiro, Brazil.

Castilla, G., A. Hernando, D. Mazumdar, C. Zhang, and G.J. McDermid. 2012. An integrated framework for assessing the accuracy of landcover polygon layers. Proceedings, 33rd Canadian Symposium on Remote Sensing, Ottawa, Ontario.

Castilla, G., C. Zhang, G. Pendray, D. Mazumdar, and G.J. McDermid, 2012: The impact of scale on the accuracy of land-cover maps. Proceedings, American Society for Photogrammetry and Remote Sensing (ASPRS) Annual Conference, Sacramento, California.

Lele, S. & Sólmos, P. (2012): Data cloning based estimability diagnostics and model selection for composite likelihood methods: Theory with application in modeling ecological communities. BIRS Meeting, Banff, AB

Mahon, C. L., Bayne, E. M., Sólmos, P., Matsuoka, S. M., Carlson, M. & Dzus, E. (2012): Does expected future habitat condition support proposed population objectives for boreal landbirds in Bird Conservation Region 6 — Boreal Taiga Plains. ESA 97th Annual Meeting, Portland, Oregon, August

McDermid, G.J., G. Castilla, A. Hernando, C. Zhang, D. Mazumdar, W. McInnes, and B. Smith, 2012. Full-coverage mapping and updating of habitat characteristics for regional biodiversity monitoring and integrated landscape management. GeoAlberta Conference, Calgary, Alberta.

Smith, B. and G.J. McDermid. 2012. Range health assessment of Dry Mixedgrass prairie using multitemporal MODIS imagery. Proceedings, 33rd Canadian Symposium on Remote Sensing, Ottawa, Ontario.

Stralberg, D., Bayne, E., Schmiegelow, F., Sólmos, P., Cumming, S., Matsuoka, S., Fontaine, T., & Song, S. (2012): Forest passerine distribution models and climate change projections for boreal North America: addressing challenges and uncertainties. Abstract Book, 5th North American Ornithological Congress, Vancouver, British Columbia, Canada, July 15–18, 2012, p. 135.

Zhang, C., G. Castilla, and G.J. McDermid. 2012. A GIS workflow for the accuracy of GEOBIA landcover products. Proceedings, 33rd Canadian Symposium on Remote Sensing, Ottawa, Ontario.

Castilla, G. and G.J. McDermid, 2011: Semi-automated generalization and updating of the EOSD land cover map in Alberta. Proceedings, 32nd Canadian Remote Sensing Symposium, Sherbrooke, Quebec.

Castilla, G., J. Hird, and G.J. McDermid, 2011: Semi-automated generalization and updating of the EOSD land cover map in Alberta. Proceedings, Canadian Association of Geographers 2011 Annual Conference, Calgary, Alberta.

Hird, J., G. Castilla, and G.J. McDermid, 2011: Geospatial technology for biodiversity monitoring in Alberta, Canada. Proceedings, Canadian Association of Geographers 2011 Annual Conference, Calgary, Alberta.

Hird, J.N., A. J. McLane, J. Linke, G. Castilla, and G.J. McDermid, 2010: Monitoring human footprint for biodiversity monitoring - the impact of sampling intensity and extent. Proceedings, American Society for Photogrammetry and Remote Sensing (ASPRS) Annual Conference, San Diego, California.

Hird, J.N., A. J. McLane, J. Linke, G. Castilla, and G.J. McDermid, 2010: Monitoring human footprint for biodiversity monitoring - the impact of sampling intensity and extent. Proceedings, American Society for Photogrammetry and Remote Sensing (ASPRS) Annual Conference, San Diego, California.

Hird, J., G. Castilla, A.J. McLane, J. Linke, and G.J. McDermid, 2010: Is a sampling approach sufficient to monitor the human footprint in the Boreal Forest? Proceedings, 24th International Congress for Conservation Biology (Society for Conservation Biology), Edmonton, Alberta.

Hird, J., G. Castilla, A.J. McLane, J. Linke, and G.J. McDermid, 2010: Is a sampling approach sufficient to monitor the human footprint in the Boreal Forest? Proceedings, 24th International Congress for Conservation Biology (Society for Conservation Biology), Edmonton, Alberta.

Linke, J., G. Castilla, A.J. McLane, and G.J. McDermid, 2009: Effect of photo plot displacement on landscape pattern analysis: implications for biodiversity monitoring in Alberta. Proceedings, 30th Canadian Symposium on Remote Sensing, Lethbridge, Alberta.

Stakeholder Presentation

Required Format: Presenter, Date, Location, Title, Platform or Poster, Name of Meeting

- 1)
- 2)
- 3)
- 4)
- 5)

Key Engagement/Participation Meeting

Required Format: Meeting Host, Date, Location

- 1)
- 2)
- 3)
- 4)
- 5)

Human Resources / Staffing Plan (roles and responsibilities)

| Name & Role | Organization | Responsibilities |
|-------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Director | ABMI, Science Centre | Manages Science Centre staff |
| Mathematician | ABMI, Science Centre | Conducts analyses for reports, products and publications |
| Ecologist | ABMI, Science Centre | Conducts analyses for reports, products and publications |
| Statistician | ABMI, Science Centre | Conducts analyses for reports, products and publications |
| Wetland Ecologist | ABMI, Science Centre | Conducts analyses for reports, products and publications |
| GIS Expert | ABMI, Science Centre | Conducts analyses for reports, products and publications |
| Quality Controller | ABMI, Science Centre | Ensure analyses and products align with key deliverables and stakeholder needs |
| Director | ABMI, Geospatial Centre | Manages Geospatial Centre staff |
| Geospatial Analyst | ABMI, Geospatial Centre | Conducts spatial analyses for reports, products and publications |
| Human Footprint Lead | ABMI, Geospatial Centre | Conducts and coordinates human footprint analyses for reports, products and publications |
| Human Footprint Technicians | ABMI, Geospatial Centre | Conducts human footprint related analyses for report, products, and publications |
| Remote Sensing Analyst | ABMI, Geospatial Centre | Conducts spatial analyses for reports, products and publications |
| Air photo Interpreters | ABMI, Geospatial Centre | Interprets air photos for 3 x 7s and landcover mapping |
| GIS Analyst | ABMI, Geospatial Centre | Conducts spatial analyses for reports, products and publications |
| Laboratory Coordinator | ABMI, Processing Centre | Coordinates lab related task including sample receiving, and sample processing |
| Aquatic Invertebrates | ABMI, Processing Centre | Coordinates the identifications of all aquatic invertebrate specimens, and conducts quality assessment |
| Acarologist | ABMI, Processing Centre | Coordinates the identifications of all acarologist specimens, and conducts quality assessment |
| Lichenologist | ABMI, Processing Centre | Coordinates the identifications of all lichen specimens, and conducts quality assessment |
| Vascular Plant Specialist | ABMI, Processing Centre | Coordinates the identifications of all vascular plant specimens, and conducts quality assessment |
| Bryologist | ABMI, Processing Centre | Coordinates the identifications of all bryophyte specimens, and conducts quality assessment |
| Laboratory Techs | ABMI, Processing Centre | Assist in the identification of aquatic invertebrates, lichen, bryophytes, mites, and vascular plants |
| Director | ABMI, Monitoring Centre | Manages Monitoring Centre staff |
| Team Lead Field Operations | ABMI, Monitoring Centre | Coordinates all field related activities, and field data collection |
| Field Coordinators | ABMI, Monitoring Centre | Oversees seasonal staff, and conduct field data collection |
| Field Technicians | ABMI, Monitoring Centre | Assist the coordinators, and conducts field data collection |
| Data Entry Coordinator | ABMI, Monitoring Centre | Coordinates the transfer of field samples and data |
| Seasonal Staff | ABMI, Monitoring Centre | Collect field data |
| Executive Director | ABMI, Management & Administration | Oversees the ABMI program |
| Program Manager | ABMI, Management & Administration | Manages the ABMI program |
| Finance Assistance | ABMI, Management & Administration | Manages the ABMI's budgets and finances |
| Accountant | ABMI, Management & Administration | Conducts the books and accounting for ABMI |
| Operations Director | ABMI, Management & Administration | Oversees and leads ABMI's daily operations |
| Regulatory Efficiencies Coordinator | ABMI, Management & Administration | |
| Access Manager | ABMI, Information Centre - Data Management | Manages and coordinates access to sites by Monitoring Centre staff |
| Access Support | ABMI, Information Centre - Data Management | Assists the Access Manager in gaining access to sites for data collection |
| Director (part) | ABMI, Information Centre - Data Management | Manages Information Centre staff |
| Website Applications | ABMI, Information Centre - Data Management | Manages ABMI websites |
| Database Manager | ABMI, Information Centre - Data Management | Manages ABMI's databases |
| Database Programmer | ABMI, Information Centre - Data Management | Assists the database manager in overseeing the ABMI's databases |
| Information Coordinator | ABMI, Information Centre - Data Management | Manages ABMI's data, coordinating data QA for public release |
| Digital Data Coordinator | ABMI, Information Centre - Data Management | Manages ABMI's camera and ARU data, coordinating QA for public release |
| Director (part) | ABMI, Information Centre - Communications | Manages Information Centre staff |
| Communication Specialist | ABMI, Information Centre - Communications | Coordinates ABMI communication material and documents |
| Communication Coordinator | ABMI, Information Centre - Communications | Coordinates ABMI communication material and documents |
| Reporting Analytics Coordinator | ABMI, Information Centre - Communications | Coordinates ABMI communication material and documents |

AEP ONLY: Additional Human Resources Required from EMSD

| Name & Role | Branch - Section | Estimated time (% of annual FTE) | Estimated Salary Range |
|-------------|------------------|----------------------------------|------------------------|
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |
| | | | Choose one |

Financial Details and Budget Request

Source of Funding Requested Year 1 - 2018/19

| | AEP ONLY: EMSD | OSM |
|----------------------------------------|----------------|-----|
| Salaries and Benefits - AEP Chargeback | | 0 |

| | | |
|----------------------------------------------------|----------|-----------------------|
| Salaries and Benefits - New OSM Staff | | 0 |
| Salaries and Benefits - non AEP | | \$3,093,075.63 |
| Operations and Maintenance | | \$1,696,655.03 |
| Consumable materials and supplies | | \$82,447.62 |
| Conferences and meetings travel | | \$24,815.00 |
| Field work travel | | \$453,282.46 |
| Project-related travel | | \$0.00 |
| Engagement | | \$58,000.00 |
| Reporting | | \$126,000.00 |
| External Contracts - Organization/Vendor/Suppliers | | \$0.00 |
| Overhead | | \$75,724.26 |
| Grants | | \$0.00 |
| Capital | | \$0.00 |
| Total budget request for the year | 0 | \$5,610,000.00 |
| Total budget approved | | |

Source of Funding Requested Year 2 - 2019/20

| | AEP ONLY: EMSD | OSM |
|----------------------------------------------------|----------------|-----------------------|
| Salaries and Benefits - AEP Chargeback | | 0 |
| Salaries and Benefits - New OSM Staff | | 0 |
| Salaries and Benefits - non AEP | | \$3,124,006.39 |
| Operations and Maintenance | | \$1,713,621.58 |
| Consumable materials and supplies | | \$83,272.10 |
| Conferences and meetings travel | | \$25,063.15 |
| Field work travel | | \$457,815.29 |
| Project-related travel | | \$0.00 |
| Engagement | | \$58,580.00 |
| Reporting | | \$127,260.00 |
| External Contracts - Organization/Vendor/Suppliers | | \$0.00 |
| Overhead | | \$76,481.50 |
| Grants | | \$0.00 |
| Capital | | \$0.00 |
| Total budget request for the year | 0 | \$5,666,100.00 |
| Total budget approved | | |

Did not review beyond year 1.

We are focusing only on 2018-2019 at the moment.

Source of Funding Requested Year 3 - 2020/21

| | AEP ONLY: EMSD | OSM |
|----------------------------------------------------|----------------|-----------------------|
| Salaries and Benefits - AEP Chargeback | | 0 |
| Salaries and Benefits - New OSM Staff | | 0 |
| Salaries and Benefits - non AEP | | \$3,155,246.45 |
| Operations and Maintenance | | \$1,730,757.79 |
| Consumable materials and supplies | | \$84,104.82 |
| Conferences and meetings travel | | \$25,313.78 |
| Field work travel | | \$462,393.44 |
| Project-related travel | | \$0.00 |
| Engagement | | \$59,165.80 |
| Reporting | | \$128,532.60 |
| External Contracts - Organization/Vendor/Suppliers | | \$0.00 |
| Overhead | | \$77,246.31 |
| Grants | | \$0.00 |
| Capital | | \$0.00 |
| Total budget request for the year | 0 | \$5,722,761.00 |
| Total budget approved | | |

Source of Funding Requested Year 4 - 2021/22

| | AEP ONLY: EMSD | OSM |
|----------------------------------------------------|----------------|-----------------------|
| Salaries and Benefits - AEP Chargeback | | 0 |
| Salaries and Benefits - New OSM Staff | | 0 |
| Salaries and Benefits - non AEP | | \$3,186,798.92 |
| Operations and Maintenance | | \$1,748,065.37 |
| Consumable materials and supplies | | \$84,945.86 |
| Conferences and meetings travel | | \$25,566.92 |
| Field work travel | | \$467,017.37 |
| Project-related travel | | \$0.00 |
| Engagement | | \$59,757.46 |
| Reporting | | \$129,817.93 |
| External Contracts - Organization/Vendor/Suppliers | | \$0.00 |
| Overhead | | \$78,018.78 |
| Grants | | \$0.00 |
| Capital | | \$0.00 |
| Total budget request for the year | 0 | \$5,779,988.61 |
| Total budget approved | | |

| | | |
|----------------------------------------------|----------|-------------------|
| Budget Request for the Entire Project | 0 | 22,778,850 |
|----------------------------------------------|----------|-------------------|

Project Approval(s)

Proposal Submitted by

| | | |
|-----------|------------|--------------|
| Surname | Given Name | Organization |
| | | |
| Signature | Date | |
| | | |

| Proposal for OSM Reviewed by | | |
|----------------------------------------------------------------------------------------------------------|---------------|---------------|
| EMSD Executive Director | Signature | Date |
| | | |
| AEP Administrator/Coordinator - Review | Signature | Date |
| | | |
| ECCC Administrator/Coordinator - Review | Signature | Date |
| | | |
| OSM Project Approved by | | |
| AEP Co-Lead for OSM | Signature | Date |
| | | |
| ECCC Co-Lead for OSM | Signature | Date |
| | | |
| AEP ONLY: Proposal for EMSD Reviewed by | | |
| EMSD Director | Signature | Date |
| | | |
| AEP ONLY: EMSD Project Approved by | | |
| EMSD Executive Director | Signature | Date |
| | | |
| EMSD Chief Scientist | Signature | Date |
| | | |
| OSM / EMSD Project Has Not Been Approved | | |
| Project Status | Date Notified | Date Required |
| The project is conditionally approved. The following conditions are required before approval is granted. | | |
| List the Condition(s) | | |
| Condition(s) Addressed / Approval Granted | | |
| Choose one | | |
| OSM / EMSD Approval Post Removal of Condition(s) | | |
| Name & Title | Signature | Date |
| | | |

| Add All Monitoring Site Locations and Coordinates (insert more rows if required) | | |
|----------------------------------------------------------------------------------|-----------------|-----------------------|
| Site Identifier * | Location Name * | Long/Lat * |
| 7 | Fort Chipewyan | -110.375534/59.820942 |
| 8 | Fort Chipewyan | -110.100601/59.741611 |
| 19 | Fort Chipewyan | -110.419456/59.607685 |
| 20 | Fort Chipewyan | -110.124588/59.61467 |
| 38 | Fort Chipewyan | -110.522453/59.464947 |
| 39 | Fort Chipewyan | -110.222572/59.395153 |
| 213 | Fort Chipewyan | -110.057426/58.28754 |
| 237 | Fort Chipewyan | -112.116707/58.346821 |
| 238 | Fort Chipewyan | -111.740158/58.276688 |
| 239 | Fort Chipewyan | -111.373962/58.281979 |
| 267 | Fort Chipewyan | -112.180862/58.177471 |
| 268 | Fort Chipewyan | -111.783432/58.141891 |
| 269 | Fort Chipewyan | -111.46656/58.078594 |
| 297 | Fort Chipewyan | -112.23436/57.949032 |
| 298 | Fort Chipewyan | -111.857712/57.974468 |
| 299 | Fort Chipewyan | -111.740158/58.276688 |
| 317 | John D'Or F | -114.909676/58.072975 |
| 319 | Fox Lake | -114.65097/58.031906 |
| 320 | Fox Lake | -114.32572/58.015667 |
| 321 | Fox Lake | -113.92694/57.989101 |
| 322 | Fox Lake | -113.57841/57.923573 |
| 346 | La Crête | -115.38159/57.92984 |
| 347 | John D'Or F | -114.98516/57.86446 |
| 348 | Fox Lake | -114.61531/57.822563 |
| 349 | Fox Lake | -114.34835/57.859009 |
| 350 | Fox Lake | -113.95290/57.797657 |
| 351 | Fox Lake | -113.74185/57.773716 |
| 376 | La Crête | -115.40654/57.746975 |
| 377 | John D'Or F | -115.01925/57.717964 |
| 378 | Fox Lake | -114.75285/57.655117 |
| 379 | Chipewyan Lake | -114.36303/57.620968 |
| 380 | Chipewyan Lake | -114.06384/57.635994 |
| 381 | Chipewyan Lake | -113.78333/57.584751 |
| 403 | La Crête | -116.42513/57.633827 |
| 404 | La Crête | -116.11931/57.590031 |
| 405 | La Crête | -115.82228/57.566681 |
| 418 | Fort MacK | -111.56298/57.196716 |
| 419 | Fort MacK | -111.22211/57.150703 |
| 420 | Fort MacK | -110.87493/57.12814 |
| 433 | La Crête | -116.41834/57.472519 |
| 434 | La Crête | -116.18395/57.42553 |
| 435 | La Crête | -115.82354/57.372704 |
| 448 | Fort MacK | -111.50598/57.004749 |
| 449 | Fort McMu | -111.28054/56.976021 |
| 450 | Fort McMu | -110.96353/56.909969 |
| 463 | Manning | -116.48435/57.295532 |
| 464 | Cadotte Lal | -116.16090/57.233665 |
| 478 | Fort McMu | -111.66748/56.848339 |
| 479 | Fort McMu | -111.32263/56.755344 |
| 480 | Fort McMu | -110.99318/56.739231 |
| 503 | Chipewyan | -113.63465/56.834305 |
| 504 | Chipewyan | -113.27545/56.801697 |
| 505 | Chipewyan | -112.99664/56.769127 |
| 534 | Chipewyan | -113.69039/56.689857 |
| 535 | Chipewyan | -113.33480/56.636044 |
| 536 | Chipewyan | -113.01401/56.627918 |
| 563 | Trout Lake | -113.75806/56.469864 |
| 566 | Chipewyan | -113.39067/56.437115 |
| 567 | Chipewyan | -113.10587/56.459156 |
| 590 | Loon Lake | -115.73555/56.49427 |
| 592 | Loon Lake | -115.10647/56.468533 |
| 605 | Conklin | -110.94726/56.004623 |
| 606 | Conklin | -110.63362/55.985703 |
| 607 | Conklin | -110.31548/55.953419 |
| 622 | Loon Lake | -115.82080/56.321774 |
| 623 | Loon Lake | -115.46196/56.253788 |
| 624 | Loon Lake | -115.14173/56.258976 |
| 637 | Conklin | -111.00402/55.811905 |
| 638 | Conklin | -110.72961/55.781212 |
| 639 | Conklin | -110.40328/55.747368 |
| 669 | Conklin | -111.12805/55.636261 |
| 670 | Conklin | -110.72843/55.620747 |
| 671 | Conklin | -110.4412/55.588326 |
| 679 | Berwyn | -117.76007/56.119915 |
| 680 | Grimshaw | -117.44725/56.062008 |
| 681 | Nampa | -117.07121/56.056721 |
| 694 | Calling Lakt | -113.04023/55.672577 |
| 695 | Calling Lakt | -112.73426/55.677059 |
| 696 | Calling Lakt | -112.42339/55.653831 |
| 710 | Tangent | -117.79676/55.934803 |
| 711 | Girouxville | -117.45108/55.872986 |
| 712 | Falher | -117.15542/55.855705 |

Corrina

59.820942 -110.375534

59.741611 -110.100601 -110.100601/59.741611

59.607685 -110.419456 -110.419456/59.607685

59.61467 -110.124588 -110.124588/59.61467

59.464947 -110.522453 -110.522453/59.464947

Site 6 39 Fort Chipew -110.222572 59.395153 -110.222572/59.395153

Site 7 213 Fort Chipew -110.057426 58.28754 -110.057426/58.28754

Site 8 237 Fort Chipew -112.116707 58.346821 -112.116707/58.346821

Site 9 238 Fort Chipew -111.740158 58.276688 -111.740158/58.276688

Site 10 239 Fort Chipew -111.373962 58.281979 -111.373962/58.281979

Site 11 267 Fort Chipew -112.180862 58.177471 -112.180862/58.177471

Site 12 268 Fort Chipew -111.783432 58.141891 -111.783432/58.141891

Site 13 269 Fort Chipew -111.46656 58.078594 -111.46656/58.078594

Site 14 297 Fort MacK -112.23436 57.949032 -112.23436/57.949032

Site 15 298 Fort MacK -111.857712 57.974468 -111.857712/57.974468

Site 16 299 Fort MacK -111.740158 58.276688 -111.740158/58.276688

Site 17 317 John D'Or F -115.23689 58.089836 -115.23689/58.089836

Site 18 318 John D'Or F -114.909676 58.072975 -114.909676/58.072975

Site 19 319 Fox Lake -114.65097 58.031906 -114.65097/58.031906

Site 20 320 Fox Lake -114.32572 58.015667 -114.32572/58.015667

Site 21 321 Fox Lake -113.92694 57.989101 -113.92694/57.989101

Site 22 322 Fox Lake -113.57841 57.923573 -113.57841/57.923573

Site 23 346 La Crête -115.38159 57.92984 -115.38159/57.92984

Site 24 347 John D'Or F -114.98516 57.86446 -114.98516/57.86446

Site 25 348 Fox Lake -114.61531 57.822563 -114.61531/57.822563

Site 26 349 Fox Lake -114.34835 57.859009 -114.34835/57.859009

Site 27 350 Fox Lake -113.95290 57.797657 -113.95290/57.797657

Site 28 351 Fox Lake -113.74185 57.773716 -113.74185/57.773716

Site 29 376 La Crête -115.40654 57.746975 -115.40654/57.746975

Site 30 377 John D'Or F -115.01925 57.717964 -115.01925/57.717964

Site 31 378 Fox Lake -114.75285 57.655117 -114.75285/57.655117

Site 32 379 Chipewyan -114.36303 57.620968 -114.36303/57.620968

Site 33 380 Chipewyan -114.06384 57.635994 -114.06384/57.635994

Site 34 381 Chipewyan -113.78333 57.584751 -113.78333/57.584751

Site 35 403 La Crête -116.42513 57.633827 -116.42513/57.633827

Site 36 404 La Crête -116.11931 57.590031 -116.11931/57.590031

Site 37 405 La Crête -115.82228 57.566681 -115.82228/57.566681

Site 38 418 Fort MacK -111.56298 57.196716 -111.56298/57.196716

Site 39 419 Fort MacK -111.22211 57.150703 -111.22211/57.150703

Site 40 420 Fort MacK -110.87493 57.12814 -110.87493/57.12814

Site 41 433 La Crête -116.41834 57.472519 -116.41834/57.472519

Site 42 434 La Crête -116.18395 57.42553 -116.18395/57.42553

Site 43 435 La Crête -115.82354 57.372704 -115.82354/57.372704

Site 44 448 Fort MacK -111.50598 57.004749 -111.50598/57.004749

Site 45 449 Fort McMu -111.28054 56.976021 -111.28054/56.976021

Site 46 450 Fort McMu -110.96353 56.909969 -110.96353/56.909969

Site 47 463 Manning -116.48435 57.295532 -116.48435/57.295532

Site 48 464 Cadotte Lal -116.16090 57.233665 -116.16090/57.233665

Site 49 478 Fort McMu -111.66748 56.848339 -111.66748/56.848339

Site 50 479 Fort McMu -111.32263 56.755344 -111.32263/56.755344

Site 51 480 Fort McMu -110.99318 56.739231 -110.99318/56.739231

Site 52 503 Chipewyan -113.63465 56.834305 -113.63465/56.834305

Site 53 504 Chipewyan -113.27545 56.801697 -113.27545/56.801697

Site 54 505 Chipewyan -112.99664 56.769127 -112.99664/56.769127

Site 55 534 Chipewyan -113.69039 56.689857 -113.69039/56.689857

Site 56 535 Chipewyan -113.33480 56.636044 -113.33480/56.636044

Site 57 536 Chipewyan -113.01401 56.627918 -113.01401/56.627918

Site 58 563 Trout Lake -113.75806 56.469864 -113.75806/56.469864

Site 59 566 Chipewyan -113.39067 56.437115 -113.39067/56.437115

Site 60 567 Chipewyan -113.10587 56.459156 -113.10587/56.459156

Site 61 590 Loon Lake -115.73555 56.49427 -115.73555/56.49427

Site 62 592 Loon Lake -115.10647 56.468533 -115.10647/56.468533

Site 63 605 Conklin -110.94726 56.004623 -110.94726/56.004623

Site 64 606 Conklin -110.63362 55.985703 -110.63362/55.985703

Site 65 607 Conklin -110.31548 55.953419 -110.31548/55.953419

Site 66 622 Loon Lake -115.82080 56.321774 -115.82080/56.321774

Site 67 623 Loon Lake -115.46196 56.253788 -115.46196/56.253788

Site 68 624 Loon Lake -115.14173 56.258976 -115.14173/56.258976

Site 69 637 Conklin -111.00402 55.811905 -111.00402/55.811905

Site 70 638 Conklin -110.72961 55.781212 -110.72961/55.781212

Site 71 639 Conklin -110.40328 55.747368 -110.40328/55.747368

Site 72 669 Conklin -111.12805 55.636261 -111.12805/55.636261

Site 73 670 Conklin -110.72843 55.620747 -110.72843/55.620747

Site 74 671 Conklin -110.4412 55.588326 -110.4412/55.588326

Site 75 679 Berwyn -117.76007 56.119915 -117.76007/56.119915

Site 76 680 Grimshaw -117.44725 56.062008 -117.44725/56.062008

Site 77 681 Nampa -117.07121 56.056721 -117.07121/56.056721

Site 78 694 Calling Lakt -113.04023 55.672577 -113.04023/55.672577

Site 79 695 Calling Lakt -112.73426 55.677059 -112.73426/55.677059

Site 80 696 Calling Lakt -112.42339 55.653831 -112.42339/55.653831

Site 81 710 Tangent -117.79676 55.934803 -117.79676/55.934803

Site 82 711 Girouxville -117.45108 55.872986 -117.45108/55.872986

Site 83 712 Falher -117.15542 55.855705 -117.15542/55.855705

Site 84

| | | |
|----------|---------------|-----------------------|
| 888 | Kikino | -112.165871/54.470558 |
| Site 100 | | |
| 889 | Kikino | -111.914276/54.434608 |
| Site 101 | | |
| 920 | Kikino | -112.469894/54.35503 |
| Site 102 | | |
| 921 | Kikino | -112.183655/54.30624 |
| Site 103 | | |
| 922 | Goodfish Lake | -111.918694/54.284721 |
| Site 104 | | |
| 953 | Smoky Lake | -112.577133/54.191296 |
| Site 105 | | |
| 954 | Smoky Lake | -112.3311/54.135212 |
| Site 106 | | |
| 955 | Vilna | -111.966194/54.127819 |