



## Sahtu Land and Water Board

### Staff Report

<b>Division:</b> Water Program	<b>File No.</b> S13L1-007
<b>Permit Type:</b> Oil and Gas Production	<b>Licence Type:</b> Industrial
<b>Date Prepared:</b> September 16, 2021	<b>Meeting Date:</b> September 23, 2021
<b>Subject:</b> Imperial Oil Resources Norman Wells Operations Aquatic Effects Monitoring Program version 3.0 and 2019 Annual Water Licence and AEMP Report	

#### 1.0 Purpose/Report Summary

To present the Public Review, Board Staff Analysis, and Hutchinson Environmental Sciences Ltd. (HESL) Technical Review (TR) of Norman Wells Operations Aquatic Effects Monitoring Program<sup>1</sup> - (AEMP) version 3.0 submitted by Imperial Oil Resources (IOR) on December 24, 2019, for Board approval and the 2019 AEMP Annual Report (reporting on years 2017-2019) submitted on March 30, 2020<sup>2</sup> for Board approval.

#### 2.0 Background (See also Table 1)

- IOR's Licence Renewal process in 2013 required the submission of an AEMP within one year of Licence issuance. A Working Group was established by the Board and Imperial to provide a formal mechanism for meeting with representatives of Indigenous governments / organizations, federal or territorial governments, regulatory Boards, and other parties with an interest in the project.
- The Working Group met three times prior to submission of AEMP version 1.0 to the Board for approval. The Board conditionally approved AEMP version 1.0<sup>3</sup> to allow the water quality monitoring component to begin, while Imperial was directed to address 14 recommendations in a revised Final AEMP Design, the key one being the inclusion of fish in the monitoring program.
- On March 5, 2018, Imperial submitted AEMP version 2.0 which was not approved by the Board and who directed Imperial to revise the AEMP to include monitoring of two fish species and increased WQ monitoring frequency and sampling locations<sup>4</sup>.

<sup>1</sup> [AEMP version 3.0](#) was submitted on December 24, 2019

<sup>2</sup> [2017 – 2019 AEMP Report](#) submitted March 30, 2020

<sup>3</sup> [December 17, 2016](#) - staff report for AEMP version 1.0 – [Decision Letter](#) January 5, 2017 outlining revisions required

<sup>4</sup> [May 28, 2018](#) – staff report for AEMP version 2.0 - [Decision Letter](#) May 28, 2018 -AMEP not approved and need to examine small fish, hydrocarbons, increase water sampling frequency, resubmit within 6 months (November 2018)

- Imperial disagreed with the Board’s decision and requested a third-party review of the AEMP, and another workshop be held. The Board supported this review<sup>5</sup> and all parties agreed to retaining Dr. Kelly Munkittrick to complete the review<sup>6</sup>. However, stakeholders were not supportive of attending another workshop referring to their previous comments and Board decisions as being definitive.
- The Munkittrick review<sup>7</sup> was submitted on June 23, 2019, and included recommendations, based on his expert opinion evidence, that supported the Board’s position, based on evidence from the public reviews of AEMP versions 1.0 and 2.0 that fish monitoring should be a component of the AEMP and that the proposed statistical analyses required further elaboration and rationale.
- Imperial agreed to these recommendations and submitted a timeline for submission of a revised AEMP to the Board, for approval.<sup>8</sup>
- Imperial submitted [AEMP version 3.0](#) on December 24, 2019.
- The Board’s public review process for the [AEMP version 3.0](#) began on January 8, 2020, when it was distributed for review through the ORS.
- The SLWB Board hosted community meetings in Fort Good Hope, Norman Wells and Tulita in February 2020 to provide an overview presentation and update on Imperial Oil activities and programs and to answer questions about the AEMP<sup>9</sup>.
- The deadline for review comments was extended several times to allow local Indigenous community organizations sufficient time to consult with members and prepare formal comments for the public review. All review comments and recommendations were submitted by June 10, 2020.
- The public review resulted in 63 additional comments and recommendations for the AEMP Design from 12 review organizations, with representation from six Indigenous organizations (FGH Band, K’asho Got’ine Charter Community, Yamoga Land Corporation, FGHRRC, FNRRC, NWRRC), two Co-management Boards (SRRB, SLWB), one territorial government (GNWT -ENR-EAM) and three federal government (CER, DFO, ECCC.) (Attachment 1).

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<sup>5</sup> [August 24, 2018](#) - Imperial request to the Board for third party review – Board requested that this request be distributed to ORS for more public input; [September 26, 2018](#) – Imperial request for third party review following public review - [Decision Letter](#) September 26, 2018 – review supported

<sup>6</sup> [Board Decision Letter](#) November 21, 2018 - supporting Dr. Munkittrick for the review

<sup>7</sup> [Munkittrick review](#) of AEMP version 2.0 – June 23, 2019

<sup>8</sup> [September 4, 2019](#) – Results of the Munkittrick third party review (review is attached to the staff report) – [Decision letter](#) September 4, 2019 accepting resubmission of revised AEMP by fall of 2019

<sup>9</sup> [AEMP Overview Presentation](#) – March 18, 2020

- On March 30, 2020, Imperial submitted their 2019 AEMP Annual Report as required by Part I Condition 3 of Licence S13L1-007. This Annual Report is subject to Board approval. The report presents three years of data and analysis (2017-2019).
- Public review of 2019 AEMP Annual Report began on April 28, 2020, with comments and recommendations indicating the need for Imperial to modify their sampling locations and frequency, statistical analysis approaches, and data interpretation (Attachment 2).
- Current Board practice is to complete an AEMP Re-evaluation Report in which the overall effectiveness of the AEMP is evaluated every three years following implementation of the AEMP Design Plan and provides supporting evidence for requesting revisions. This is not a condition of Imperial’s current Licence.
- The Board’s review of the Annual AEMP Report must address the following considerations:
  - i. is the data accurately reported?
  - ii. have licence conditions been met?
  - iii. are data interpretation and conclusions appropriate?
- The Board’s review of the AEMP Design Plan must answer how the Licensee will monitor Project-related effects in the **aquatic Receiving Environment**, and how the Licensee will analyze, report, and respond to monitoring results.
- The Board may provide direction to Imperial on how and when to make any recommended changes to the AEMP Design Plan.

## 2.2 Regulatory Process

**Table 1** below presents a timeline for the current Licence AEMP process based on the Licence conditions (column 1), due dates for submissions (column 2), AEMP submissions from Imperial (column 3), Board decisions on AEMP submissions (column 4).

**Table 1: Imperial’s Norman Wells Operation Licence S13L1-007 requirements and timelines for AEMP Design and Implementation submissions**

S13L1-007 Licence Conditions – Part I or Board Direction	Due Date	Imperial Submissions	Board Process and decisions
The requirement for an AEMP and the formation of a Working Group to develop a plan was an outcome of Technical Sessions during the licence renewal process.	March 5, 2015 (issuance)		Facilitated three Working Group meetings to develop [conceptual] AEMP <ul style="list-style-type: none"> <li>• November 20, 2014</li> <li>• September 22, 2015</li> <li>• January 26, 2016</li> </ul>
<b>1. Submit an AEMP Design Plan for Board approval within one year of Licence issuance - follow AANDC AEMP Guidelines</b>	March 5, 2016	AEMP version 1.0 submitted on March 2, 2016	<ul style="list-style-type: none"> <li>• public review period March 8, 2016 to October 14, 2016;</li> <li>• SLWB/HESL peer review</li> <li>• <b>Decision January 5, 2017</b> - AEMP conditionally approved for 18 months to begin collection of WQ data;</li> <li>• a revised AEMP to be submitted within a year.</li> </ul>
January 5, 2017 Board direction: submit revised AEMP Design Plan to address 14 recommendations	January 5, 2018	<p>July 4, 2017 – deferral requests:</p> <p>a) extend revision due date until January 5, 2019;</p> <p>b) defer WQ monitoring until spring 2018</p> <p>November 21, 2017 – request for 2-month extension</p>	<p><b>Decision August 1, 2017</b> – deny a) and approve b)</p> <p><b>Decision on December 5, 2017</b> – approved with new due date</p>
December 5, 2017 Board direction: submit revised AEMP Design Plan to address 14 recommendations	March 5, 2018	<p>AEMP version 2.0 submitted on March 5, 2018</p> <p>(note: AEMP version 1.0 was conditionally approved for 18 months – until July 5, 2018 – with Board direction to continue monitoring as per version 1.0 and with increased frequency. This extends the approval of version 1.0)</p>	<p>public review March 7, 2018 to May 2, 2018</p> <p><b>Decision on May 30, 2018</b> – Not approved</p> <ul style="list-style-type: none"> <li>• Resubmit in 6 months and include 2 fish spp. (slimy sculpin and loche);</li> <li>• increase WQ sampling to min. 6 X / year;</li> <li>• continue to collect WQ data as per AEMP version 1.0 with increased frequency.</li> </ul>

S13L1-007 Licence Conditions – Part I or Board Direction	Due Date	Imperial Submissions	Board Process and decisions
May 30, 2018 Board direction: submit revised AEMP Design Plan to include fish monitoring and increased sampling frequency and locations	November 30, 2018	July 31, 2018 – request for third party review of AEMP and additional workshop	<p><b>Decision on August 24, 2018</b> – send the request to the ORS for full public review</p> <p>Public review August 28, 2018 to September 20, 2018</p> <p><b>Decision on September 26, 2018</b> – approve a third-party review process that would be subject to full public review; extend the due date for resubmission of the AEMP Design Report</p>
September 26, 2018 Board direction: approve a third-party review process	? TBD	<p>October 31, 2018 recommends Dr. Kelly Munkittrick for the third-party review</p> <p>January 14, 2019 Imperial seeks dates for a workshop facilitated by Dr. Munkittrick</p> <p>June 23, 2019 - Munkittrick Review of AEMP version 2.0 submitted; letter charting a path forward and timelines for revisions to the AEMP</p>	<p><b>Decision on November 21, 2018</b> – approval (Dr. Kathy Racher provided opinion)</p> <p>January 24, 2019 – SLWB staff could not summon any positive responses from stakeholders to attend a fourth workshop to discuss the inclusion of fish in AEMP</p> <p><b>Decision September 4, 2019</b> – agreement with fall 2019 submission of revised AEMP incorporating Dr. Munkittrick recommendations</p>
September 26, 2019 Board direction: Imperial proposed date for submission of AEMP version 3.0 accepted	October - November 2019	December 24, 2019 AEMP version 3.0 submitted	<p>public review January 8, 2020 to October 5, 2020:</p> <ul style="list-style-type: none"> <li>• Imperial AEMP version 3.0;</li> <li>• Munkittrick review; HESL Technical Review</li> <li>• SLWB concordance table of changes</li> </ul>
3. Submit AEMP Annual Report to the Board for approval	April 30, 2017, 2018, 2019	March 30, 2020 submission of (first) 2019 Annual AEMP Report (reporting on WQ data collected between June to October in the years 2017, 2018, 2019)	public review on April 28, 2020 to August 19, 2020
3. Annually review the Plan and make any revisions to reflect operational changes, or as directed by the Board.	??		SWLB began to prepare the AEMP Re-evaluation Report in November 2020.

### 3.0 Board Staff Comments

- The Board was troubled by the degree of outstanding public concern relating to the AEMP and comments about the relationship that Imperial has with the communities who represent the people at the greatest risk to effects from Imperial Oil Norman Wells Operation.
- The Board felt that it was necessary to complete a comprehensive review of all evidence related to Imperial’s Aquatic Effects Monitoring Programs from the time of the facility expansion in the 1980s until present. Board staff review began with the 1981 Report of the Environmental Assessment (EA) Panel for the Norman Wells Oilfield Development and Pipeline Project and all documents related to AEMP, including Public Hearing Transcripts, from the files S99L1-003, S03L1-001, and S13L1-007 on the SLWB Public Registry, and all comments received during the public review process for AMEP version 3.0.
- Board staff review of previous studies and reviews, public hearing transcripts, and other documents related to AEMP identified gaps where additional studies could be completed to confirm or verify preliminary or inconclusive results and support community concerns, and questions for verification and more detailed expert technical review.
- Board staff organized comments and concerns into **six key Themes (Table 2)**:
  1. Regulatory Process
  2. Community Concerns
  3. AEMP Design Plan
  4. Stressors
  5. Fish Studies
  6. Water Quality Monitoring Program – 2020/2021 AEMP Annual Reports.
- These six themes were then organized into:
  - A. Regulatory Process concerns and issues,
  - B. Technical and Scientific concerns and issues, and
  - C. Traditional Knowledge and Community Engagement concerns and issues.
- In February of 2021 the SLWB retained Hutchinson Environmental Sciences Ltd. (HESL) to address the Technical and Scientific concerns and issues. Specifically, they asked that HESL:
  - \* Review all public review materials to confirm, clarify or provide additional technical rationale, scientific evidence, and/or analytical methods to inform a revised AEMP design;
  - \* Complete a more comprehensive analysis of technical problems identified in the public review of the AEMP submissions;
  - \* Review reference data and reports and technical literature and provide expert opinion supporting technical rationale; and,
  - \* Identify any additional gaps from their own review, provide rationale and make recommendations that are technically sound and defensible to address them.

- The Final HESL Technical Review was submitted to the Board on August 16, 2021 (Attachment 3).

**Table 2: Themes, Sub-themes and Task Breakdown for the AEMP Re-evaluation Report**

Key Themes	Sub-themes	Responsible to Address
<b>REGULATORY PROCESS</b>		
1. Regulatory Process		BOARD
<b>TRADITIONAL KNOWLEDGE / COMMUNITY ENGAGEMENT and TECHNICAL AND SCIENTIFIC</b>		
2. Community Concerns	a) Cumulative Impact Assessment b) Traditional Knowledge c) Information Sharing / Relationships d) Healing Closure for Imperial Norman Wells Operation	HESL Major BOARD w. input from KR BOARD w. input from KR BOARD w. input from KR
<b>TECHNICAL AND SCIENTIFIC and TRADITIONAL KNOWLEDGE / COMMUNITY ENGAGEMENT</b>		
3. AEMP Design Plan	a) Scope b) EEM versus AEMP Approaches c) Including Previous Studies / Baseline Data / Historic Data d) Focus on Pathways (Water) e) Ask the Right Questions f) Refine Objectives g) Action Level Responses	HESL Major – purpose and whole site AEMP – all stressors HESL Major – add EEM elements to AEMP HESL Major – review old studies HESL Major - interpretation based on all reviews BOARD w. input from KR HESL Minor – review questions and AEMP interpretation BOARD w. input from KR HESL Major – scope /w. input from KR HESL Major – recommendations on what the AEMP should contain / w. input from KR
<b>TECHNICAL AND SCIENTIFIC</b>		
4. Stressors	a) Flowlines b) Chemicals c) Seeps	HESL – minor – is the evidence there? HESL – minor – is the evidence there? HESL Major – seep locations and how to monitor
<b>TECHNICAL AND SCIENTIFIC and TRADITIONAL KNOWLEDGE / COMMUNITY ENGAGEMENT</b>		
5. Fish Studies	a) Inclusion of Fish in the AEMP b) Fish Sampling Design Considerations	HESL Major Major – fish sampling design considerations
<b>TECHNICAL AND SCIENTIFIC</b>		
6. Water Quality Monitoring Program – 2020/2021 AEMP Annual Reports.	a) AEMP v. 1.0 Water Quality Sampling Design – Pathway Focus and use of SPMDs b) Sampling Frequency and Location c) Under-ice Sampling d) Data Analysis and Interpretation e) Reporting	HESL Major HESL Major – AEMP Design HESL Minor – elaborate why? HESL – is this feasible? – enough data? HESL – minor – elaborate why?

- Traditional Knowledge and Community Engagement concerns and issues will be addressed by the Board (in near future) through an investigation completed by conducting face-to-face focus group interviews of 5 – 10 people in each of the five Sahtu communities and potentially one-on-one interviews. Participants will be selected based on their knowledge of and interest in Imperial Oil issues (i.e former employees, or past witnesses in public hearings).
- The objective is to gather information and knowledge by asking open-ended questions related to issues and concerns that have been raised during the AEMP review process and to verify and/or corroborate oral evidence from previous public hearing transcripts.
- The goal is to help inform and provide direction to Imperial / ESSO on the path forward to address/redress long-standing community concerns over ESSO's 100-year operation in Norman Wells.
- This information will be shared with Imperial.

#### 4.0 Other Agency Comments

Attachments 1 and 2 present the Review Comment Table for AEMP version 3.0 (1) and the Review Comment Table for 2019 AEMP Annual Report (2). The Board's responses to each of the recommendations based on the evidence is provided in the final column.

#### 5.0 Conclusion and Recommendation

Board staff do not support the approval of AEMP version 3.0 because it does not fulfill the core objective of AEMP which is to detect impacts on aquatic organisms and determine if they are related to operations.

Board staff have drafted a Letter of Direction to IOR identifying shortcomings in Norman Wells Operations AEMP version 3.0 with eight (8) specific instructions to improve the AEMP Design and one direction (Attachment 4).

Board staff recommend that the Board:

**NOT APPROVE** Norman Wells Operations Aquatic Effects Monitoring Plan version 3.0, and **DIRECT** Imperial to submit a response to the recommendations contained in the HESL 2021 TR within 90 days from the date of this letter, outlining a proposed process and timeline for submission of a revised AEMP version 4.0 to the Board, for approval, and a response and action for each of the following eight identified shortcomings.

These include, briefly:

- (A) Immediately complete and submit to the Board for approval, the Special Effects Study required by **Licence S13L1-007 Part I, Condition 1 and Schedule 6, Items 1 and 2.**



- (B) Immediately complete the first step of the small fish study which is to identify and confirm the species, the sampling sites, and the sampling methods to be used in the AEMP.
- (C) Revise the AEMP design to identify the key Contaminant of Potential Concern (COPC) for the AEMP is hydrocarbon and related products. The AEMP must be capable of distinguishing natural sources of hydrocarbons from any facility related inputs.
- (D) Revise the key question for the AEMP to the following as recommended by HESL 2021 TR: *Has the IORL Norman Wells Operation resulted in changes to the accumulated environmental state of the aquatic environment?*
- (E) Revise the AEMP from a “stressor based” to an “effects based” design and include natural stressors (hydrocarbon seeps above and adjacent to the site, seepage of groundwater from the site) to represent a cumulative effect framework.
- (F) The Board supports the following specific recommendations from the HESL 2021 TR:
- a. The AEMP must sample under the ice to sample low flow periods.
  - b. The surface water sampling program is not effective and there is little point in continuing it in the present form.
  - c. Sediment sampling is not recommended as a necessary component of the AEMP because the dynamic sedimentation and erosional processes in the river do not create a stable depositional environment for depositional records.
- (G) The Board supports the recommendation of HESL 2021 TR that a community study of burbot (loche) should be included as part of the AEMP. The Board commits to undertake the appropriate discussions with the Sahtu communities and Imperial to develop a design that will be useful and acceptable to all parties. This Special Large Fish Study (LFS) will be prepared and implemented as a separate study or addendum to the AEMP.
- (H) **SUBMIT** to the Board, for approval, an updated and revised AEMP version 4.0 for Imperial’s Norman Wells Operation, following Board approval of A) and B), and following Board approval of Imperial’s proposed process and timeline for undertaking these additional studies and revisions.

## 6.0 Reference Material

- 6.1 Attachment 1 – Review Comment Table for AEMP version 3.0
- 6.2 Attachment 2 – Review Comment Table for 2019 AEMP Annual Report
- 6.3 [MVLWB/GNWT Guidelines for Aquatic Effects Monitoring Programs](#)
- 6.4 Attachment 3 – Hutchinson Environmental Science Ltd. AEMP Technical Review
- 6.5 Attachment 4 – Draft Letter of Direction

Respectfully submitted,

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