2 December 2016

Alberta Energy Regulator Authorizations Review and Coordination Team Suite 1000, 250 – 5 Street SW Calgary, Alberta T2P 0R4 E-mail: ARCTeam@aer.ca

Re: <u>The Imperial Oil Resources Ventures Limited Tailings Management Plan for the Kearl Oil</u> Sands Mine **OSCA Application** No. 1872083

Dear Authorizations Review and Coordination Team:

I am writing on behalf of the Oilsands Environmental Coalition (OSEC) regarding the Imperial Oil Resources Ventures Limited (Imperial) Tailings Management Plan (TMP) for the Kearl Oil Sands project (hereinafter the 'Modified Project'). The proposed modifications relate to tailings management of the existing Kearl project (hereinafter the "Existing Project"), which includes the north pit mine (operating since 2013), reclamation material storage areas, overburden disposal areas, a reservoir for process water/external tailings area (ETA), oil sands processing, and ancillary facilities. Pursuant to Section 13 of the Oil Sands Conservation Act (OSCA), this letter is submitted as a Statement of Concern from OSEC regarding the Modified Project.

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute. Members of OSEC have a legal interest in recreational lease lands near the Settlement of Fort McKay, in close proximity (approximately 40 kilometers) upstream from the Modified Project operations. The interest consists of a license to occupy lands on the Muskeg and Athabasca Rivers for recreational purposes, such as camping, boating and fishing. Members of OSEC are concerned that Imperial's Modified Project will adversely impact water quality and quantity, wildlife species and terrestrial values, and recreational opportunities available to OSEC members.

OSEC has longstanding concerns about the growing risks that oilsands tailings pose to the environment. We are concerned about the extent to which the Modified Project meets the stated intent and technical requirements of the recently issued *Lower Athabasca Region – Tailings Management Framework for the Mineable Oilsands* (TMF), which comprises a policy direction intended to "manage fluid tailings volumes during and after mine operation in order to manage and decrease liability and environmental risk resulting from the accumulation of fluid tailings on the landscape."¹ The Imperial Kearl Oil Sands Project **OSCA Application No. 1872083** claims to comply with the *Tailings Directive 085: Fluid Tailings Management for Oilsands Mining*

¹ Government of Alberta. 2015. Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF), p.1.

Projects,² which was developed under the *Oilsands Conservation Act* (OSCA) and sets requirements for managing fluid tailings volumes for oilsands mining projects. We have several concerns regarding the sufficiency of this application in meeting the information requirements, fluid tailings management reporting, and surveillance and compliance processes stipulated by the Directive. In this regard, we have prepared a preliminary list of questions and concerns that we would like to bring to the Director's attention.

1. Identify why you believe you may be directly and adversely affected by a decision of the AER on the application(s)

All members of OSEC are directly and adversely affected by a decision of the AER on the application(s) cited herein. OSEC has an interest in lands near Fort McKay and in close proximity to the Modified Project. The interest consists of a license to occupy lands on and near the MacKay and Athabasca Rivers for recreational purposes, such as hiking, bird watching, camping, swimming and boating. Consequently all employees from Pembina and members of FMEA will be directly affected relative to their potential recreation activities on the recreation-leased lands.³

The Modified Project is located in Townships 95 and 96, and 97, and Ranges 6, 7, and 8 west of the 4th Meridian, about 70 kilometers northeast of Fort McMurray, Alberta. Given its close proximity to Fort McMurray and Fort Mackay, individual members of FMEA are directly and adversely affected by the Modified Project. As all members of OSEC have an interest in recreational lands near Fort McKay, they will be affected by environmental impacts in this region resulting from the Modified Project.

While emphasizing that it will first and foremost be directly and adversely affected by a decision of the AER on the Imperial application, OSEC contends that it also meets the requirements for participation as a genuine interest intervener, as set out in the recent changes to intervener status procedures under the auspices of the AER's enhanced participation pilot program for Directive 085 Tailings Management Plan (TMP) applications. As such, **Appendix A** has been included to demonstrate OSEC's supplementary eligibility for genuine interest intervener status, in addition to its primary eligibility to participate as directly and adversely affected.

2. Identify the nature of your objection to the application(s)

Imperial's Tailings Management Plan (TMP) for the Modified Project is submitted in accordance to *Directive 085: Fluid Tailings Management for Oil Sands Mining Projects* (Directive 085). With this submission, Imperial seeks approval for the updated life of mine TMP for the Modified Project, which includes proposed Ready To Reclaim Criteria, Fluid Tailings (FT) profiles, and end-of-mine life (EML) FT volume targets. This application also seeks approval for an amendment to Approval No. 10829F.

² AER. 2016. Directive 085: Fluid Tailings Management for Oilsands Mining Projects.

³ These lands are legally described as:

a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;

b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;

c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and

d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

OSEC has concerns regarding the Modified Project's proposed fluid tailings profiles, proposed tailings treatment technologies, proposed reclamation timelines and outcomes, and lack of adequate contingency planning. Moreover, OSEC has concerns regarding AER procedures for ensuring industry-wide best practices in tailings management in alignment with Directive 085 and the TMF.

These concerns are described in more detail below.

I. Proposed Fluid Tailings Profiles

OSEC is concerned about Imperial's proposed fluid tailings profiles. The stated objective of the TMF, as indicated in Sections 3.4 and 5.0 is:

[To minimize] fluid tailings accumulation by ensuring that fluid tailings are treated and reclaimed progressively during the life of the project and all fluid tailings associated with a project are ready-to-reclaim within 10 years of the end of mine life of the project. The objective will be achieved while balancing environmental, social, and economic needs.

Imperial states a commitment to this objective in order to "minimize the accumulation of FT to ensure timeline progress to closure" (Section 2.1). However, Imperial's FT profile maximizes tailings accumulation allowances prescribed by the TMF. Imperial's proposed FT profile includes accumulation for precisely 10 years following D085 implementation, stabilization at 180Mm³ for 27 years, and decline until 5 years of FT volume remains at EML. This trajectory does indeed comply with the guideline prescribed within Section 5.2.1 of the TMF for "Phase I – Early Production," as well as the guideline prescribed for "End-Of-Mine Life." However, OSEC is concerned that the proposed profile for the Modified Project demonstrates an insufficient effort to encourage aggressive FT treatment, as the selected profile simply meets the minimum requirements of the TMF.

Section 5.2.1 of the TMF also provides a guideline for "Phase II – Design Operation," which states an expectation that growth of fluid tailings will closely match the rate of treatment so that, on average, fines can be managed to a treated state as they are produced. However, the proposed FT profile for the Modified Project assumes the approval of a proposed expansion scheduled for 2025-27 (Appendix A-2). As stated in Imperial's TMP, "[t]he basis for this application is the AER-approved throughput of 345,000 barrels per calendar day. To achieve this approved level, the life of mine tailings plan includes anticipated company funding and timing of potential future mine and plant expansions" (p.1). As such, the FT profile proposed by Imperial assumes the highest possible production levels and, correspondingly, the highest possible level of total FT accumulation. OSEC contends that this approach is unreasonable, and that any approvals for this project should be granted based on current actual production rates (220kbd), with amendments for future production changes implemented as necessary.

Furthermore, Requirement 8(d) in Section 4.4 of Directive 085 reads as follows:

The application [must contain] a justification for the proposed legacy and new volume profiles, including:

i. justification for volume at end-of-mine-life;

- ii. justification for rate and magnitude of new tailings after 2015; and
- iii. justification for deviation from *Tailings Management Framework* inventory profile guidelines.

However, Imperial does not provide adequate justification for the accumulation of FT until 2025 (Section 2.7.2). OSEC requests that this deficiency be addressed, and seeks clarification regarding what factors are delaying FT stabilization until 2025, as well as what factors are expected to cause the FT inventory to stabilize at this particular time.

Finally, Section 4.4 of Directive 085 stipulates that the EML targets must be equivalent to 5 years or less of FT accumulation. Imperial's TMP anticipates 125Mm³ at EML, assuming the maximum possible full FT production of 25Mm³/year. However, OSEC's independent calculations of average FT produced throughout the life of the project is approximately 18Mm³/year, which renders 125Mm³ equivalent to 6.9 years of full FT production.⁴ OSEC seeks clarification regarding this apparent discrepancy.

II. Fluid Tailings Treatment Technologies

OSEC is concerned by Imperial's selections in fluid tailings treatment technologies, in particular the plan's primary reliance on Thickened Tailings (TT) deep deposits. Requirement 10 in Section 4.6 of Directive 085 reads as follows:

The application [must justify] the technologies proposed and provide details including:

- a) map of proposed treatment areas;
- b) description of the technology, including robustness, practicality and stage of development;
- c) timing and milestones for each technology;
- d) process flow diagram;
- e) chemical and physical properties of treated tailings and recovered water; and
- f) management of off-spec materials.

Imperial's TMP for the modified project proposes 60m deep TT deposits, a technology with which a high degree of performance uncertainty is associated. Imperial states that their plans are based on previously conducted "beach and lab scale testing and modelling to understand the expected performance of the thickeners, secondary chemical treatment, and the TT deposit" (Section 3.1.4). As such, it is apparent that Imperial has not yet applied this technology at commercial scale. OSEC is concerned that this lack of commercial experience undermines confidence that the treatment technology and tailings plan will perform as expected. This concern is compounded by the minimal flexibility provided by TT technology to increase throughput, since TT is tied to production via flotation tailings (Section 6.2.1).

Due to the high degree of uncertainty with TT deep deposit performance, Imperial has proposed highly flexible closure and reclamation outcomes. As Imperial states in Section 6.2.2, the high degree of uncertainty with the proposed technology generates "a corresponding uncertainty around the eventual design of the closure landscape." As such, Imperial advises that "the design

⁴ *Calculation used*: (Year(x) FT – Year (x-1) FT + Year (x) RTR FT)

of the closure landscape is flexible, and a different option may be selected if future understanding of the TT deposit suggests a more suitable alternative" (6.2.2). OSEC is concerned by this high degree of uncertainty, particularly because other treatment technologies have already been demonstrated to be more satisfactorily reliable and effective on a commercial scale.

Finally, Section 4.1 of Directive 085 stipulates that applications must show commitment to innovation and continuous improvement. Table 7-1 of Imperial's application illustrates changes made to the TMP since Directive 074 was rescinded. OSEC contends that this Table demonstrates a significant degree of both regression and failure to meet expectations with Imperial's selected treatment technologies. For instance, thickeners start-up was delayed by nearly a year, TSRU thickener has been disbanded, and the volume of FT designated for treatment via water-capping in the End-Pit-Lake (EPL) has now increased from 65Mm3 to 125Mm3. OSEC seeks more comprehensive justifications for these changes, and how they contribute to ongoing technological innovation and improvement.

III. Reclamation Outcomes

OSEC is concerned by Imperial's proposed reclamation timelines and outcomes. Firstly, Section 3.3 of the TMF stipulates that applications must ensure a stable landscape and a diverse, locally common, and self-sustaining ecosystem will be in place after reclamation. Table 4-1 of Imperial's TMP illustrates settlement of approximately 10cm/year for the 20 years following capping. OSEC contends that this settlement timeline is quite long, and seeks further clarification regarding the rationale for why it will be necessary. Notably, OSEC prioritizes final landscape performance as more critically important than timelines, but asserts that there should be clearer justifications made regarding this trade-off for the proponent's case-specific application.

Secondly, Section 3.3 of the TMF stipulates that end landscape objectives must be considered during the planning and operation phases. Imperial anticipates final landscapes to be more firmly defined in its 2017 EPEA application, however OSEC is concerned that at this juncture end landscape objectives are highly flexible and largely contingent on the performance of TT deposit performance. Requirement 13(e) in Section 4.7 of Directive 085 requires that applications justify how the proposed performance indicators and criteria align with targeted landforms. In Section 6.2.2 of its TMP, Imperial states "the design of the closure landscape is flexible, and a different option may be selected if future understanding of the TT deposit suggests a more suitable alternative." OSEC contends that this approach controverts Requirement 13(e) by rendering final landscapes as reliant on deposit performance rather than the inverse. Further, Imperial states that a sheer strength of 2kpa is considered adequate for capping (Section 4.1.2). As Directive 074 mandated a sheer strength of 5kpa, OSEC seeks clarification regarding the risks associated with this weaker requirement and a justification for their acceptability.

Thirdly, Requirement 13(f) in Section 4.7 of Directive 085 stipulates that applications must identify critical milestones for each deposit including deposit preparation, start of fluid tailings placement, capping, and start of further reclamation activities. In Table 3-2, Imperial states "[s]olids contents of 65% or greater are expected to be achieved in the uppermost (final) layers of the deposit (see sections 4.1.1 and 4.1.2). This is expected to enable placement of the initial sand cap shortly after deposition is complete." OSEC contends that the term 'shortly' is unreasonably vague, and seeks a more precise quantification here. Similarly, OSEC seeks quantitative clarification regarding the frequent use of the term 'rapidly' in Section 4.1.1. Moreover, Figure 4-1 illustrates that consolidation will continue after capping occurs. OSEC

seeks clarification regarding when this consolidation will end, and whether adequate consolidation can be achieved in a circumstance wherein the SFR is <1.

Finally, Requirement 13(g) in Section 4.7 of Directive 085 stipulates that applications must identify uncertainties (nature and magnitude) associated with deposit performance and design features that mitigate deposit effects to the surrounding environment. OSEC is concerned by the high degree of uncertainty with TT deep deposit performance (particularly concerning timing), and contends that Imperial's TMP does not adequately meet Requirement 13(g) in addressing this. Imperial states in Section 3.1.5 that "[t]he time required to place reclamation materials and to ultimately achieve closure will be based on the expected residual settlement and/or observed settlement rates after placement." However, no tangible options are offered to mitigate against this high degree of uncertainty other than promoting adaptive management and an observational approach, with a flexible closure landscape.

IV. Lack of Contingency Planning

OSEC is concerned by the inadequacy of Imperial's contingency planning in its TMP for the Modified Project. Firstly, Requirement 11 of Section 4.6 in Directive 085 stipulates that applications must describe uncertainties, mitigation measures and contingency plans for unproven technologies. Imperial correspondingly presents its prioritization of an "Adaptive Management or Observational Approach" in Section 6. However, OSEC contends this approach maintains an unreasonably high degree of uncertainty with insufficient mitigation. In Table 6-1 some mitigative measures are offered, but there is no comprehensive discussion of contingency planning for a circumstance wherein the TT approach is consistently underperforming. OSEC contends that tangible and viable alternative technology options must be proposed with a comprehensive mitigative implementation plan to address this potential outcome.

Secondly, Requirement 12 in Section 4.6 of Directive 085 requires that where water-capped tailings technology is proposed, applications must identify an alternative treatment technology. Table 7-1 illustrates that the Modified Project will have 125 Mm³ of water-capped FT in the EPL, relative to 65 Mm³ as in the previously submitted TMP. Despite this significant increase, Imperial states that "[n]o alternative treatment technologies to an EPL are included in this application... [and a] decision confirming water-capped FT in an EPL or proposing an alternate treatment technology will be submitted to the AER no later than 2031" (Section 2.5.5). OSEC contends that this is not acceptable, and fails to meet the stated requirements of Directive 085.

The rationale provided by Imperial for not submitting a contingency plan for water capping is as follows:

Given the early stage of production at Kearl and the projected mine life to 2056, selecting a technology based on current research might exclude future, more effective treatment technologies. Imperial will keep abreast of research into alternative tailings treatment technologies. Such technologies, when their results become available to Imperial, will be evaluated for applicability to the Kearl tailings management plan. (Section 2.5.5)

OSEC contends that this is unacceptable, and that it is imperative that proponents submit alternative viable treatment options to water-capping as per the explicit requirements of the Directive. This is particularly concerning for Imperial's application, as unlike other proponents no treatment prior to placing the FT in the EPL is proposed (Section 2.7.2).

Finally, Requirement 14 in Section 4.8 of Directive 085 reads as follows:

The application must describe (nature and magnitude) the environmental effects and risks of environmental effects of the proposed management option, including for each fluid tailings pond, treatment area, and treated tailings deposit. In addition, describe

- a. how they will be managed or mitigated during operations, reclamation, and closure;
- b. changes to or additional pollution prevention and mitigation measures necessary to reduce environment effects of the proposed option; and
- c. changes in local circumstances, policies, or regional initiatives that need to be addressed.

In Sections 2.8 and 4.2.2 Imperial lists the following potential environmental effects and risks for the proposed management option: ground water, surface water, stability, minimizing FT accumulation, progressive reclamation, and minimizing land footprint. OSEC contends that these sections are not sufficiently comprehensive, particularly when reviewed in comparison to the other applications. More detailed information regarding environmental effects and risks of proposed management options and associated prevention and mitigative measures is requested.

V. Ensuring Best Practices in Tailings Management

OSEC is interested in ensuring that all companies are using best practices in addressing tailings management and that operators will be held to similar standards. Notably, Pembina is currently conducting an industry-wide analysis of all Directive 085 applications. The results of this analysis to date have demonstrated that cumulative tailings inventories are not consistent with the expectations presented in the TMF. OSEC correspondingly continues to seek clarification regarding how the AER will consolidate and critically analyze all proponents' trajectories, and delineate which projects are underperforming at the expense of industry-wide expectations.

The TMF graphically outlines the expected cumulative trajectory of all fluid tailings on the landscape including a peak date for tailings accumulation, a rate of decline, and the point at which tailings cumulative tailings volumes will actually decline (**Figure 1**). OSEC has amalgamated the projected tailings volumes from all Directive 085 applications submitted to date, and compared it with the aforementioned TMF trajectory (**Figure 2**). This analysis has demonstrated a general trend wherein cumulative tailings volumes are peaking roughly ten years later than the TMF anticipated.

OSEC and the AER's ability to determine the adequacy of Imperial's plans are correspondingly dependent on an assessment that the sum of the approved tailings plans are consistent with the TMF's objectives. As such, it is essential for regulators and stakeholders to compare all tailings plans in conjunction to ensure responsible regulatory decisions are made. We thereby strongly recommend that no applications be approved until all proponent plans have been comprehensively reviewed.



Figure 1: Expected Cumulative Tailings Under the TMF⁵

Figure 2: Cumulative Tailings Volumes of All Directive 085 Applications



(Original Figure)

⁵ Government of Alberta. 2015. Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF), p.18.

3. Identify the outcome of the application you advocate

At this time, OSEC submits that Imperial's TMP application for Directive 085 is incomplete. OSEC correspondingly requests that Imperial provide the aforementioned additional evidence and amendments to increase confidence regarding the Modified Projects' compliance with the TMF. In order to fulfill its mandate to ensure safe, efficient and responsible development of Alberta's natural resources, the Alberta Energy Regulator should request additional information from the proponent before proceeding to a hearing. OSEC wishes to work with Imperial and the AER to comprehensively address the deficiencies and impacts outlined above and review the cumulative tailings trajectory expected from approval of this and other applications.

4. Identify the location of your land, residence, or activity in relation to the location of the energy resource that is the subject of the proposed application; and your contact information including your name, address in Alberta, telephone number, e-mail address or, if you do not have an email address, your fax number.

The Pembina Institute and the Fort McMurray Environmental Association have signed an agreement with Fort McKay Metis Local #63. The lands in the agreement are partially adjacent to the McKay River and are legally described as:

- a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;
- b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;
- c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and
- d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

The contract lands are approximately 40 kilometers upstream from the Modified Project. The recreational agreement provides that OSEC members may access the contract lands to recreate (i.e hiking, camping, swimming) providing one week's prior notice is offered to Fort McKay Metis #63.

The Oilsands Environmental Coalition (OSEC) is an unincorporated coalition of Alberta public interest groups and individuals with a long-standing interest in the Athabasca Oilsands area. OSEC was formed to facilitate more efficient participation in the regulatory approvals processes for oilsands applications. Its current members include the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Fort McMurray Environmental Association (FMEA) 260 Grandview Crescent Fort McMurray, Alberta T9H 4X8 Attention: Ann Dort-MacLean girlsinc@telus.net

FMEA consists of residents living in and around Fort McMurray who are concerned about the effects of oilsands development on human health, the ecosystem and the socio-economic quality of life in the municipality of Wood Buffalo. As of 2012, FMEA had 37 members.

The Pembina Institute 219 19 Street NW Calgary, AB T2N 2H9

The Pembina Institute is a non-profit environmental research organization founded in Alberta in 1985. One of its objectives is to minimize the environmental impacts associated with fossil fuel development in Alberta. It has monitored the health and environmental implications of oilsands development since the mid-1980's and has been particularly active in the assessment and management of long term, chronic, and cumulative impacts.

Conclusion

This Statement of Concern should be considered preliminary rather than final and conclusive. OSEC retains the right, upon further analysis of the project proponent's regulatory filings, to bring new issues to bear in a regulatory setting. OSEC is interested in working with Imperial to attempt to resolve these important issues and we seek a formal ADR process and forum to support this assessment.

Sincerely,

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Jodi McNeill Analyst, Responsible Fossil Fuels Pembina Institute On behalf of the Oil Sands Environmental Coalition

cc Imperial Oil Resources Ventures Limited 505 Quarry Park Boulevard SE Calgary, Alberta T2C 5N1 Attention: Jennifer Haverhals Telephone: 587-476-2555 Email: jennifer.r.haverhals@esso.ca

Appendix A

OSEC should be permitted to participate in the process because it is directly and adversely affected by the application, as set out in the preceding Statement of Concern. In the alternative, OSEC should be permitted to participate because it also meets the requirements for participation as a genuine interest intervener, as set out herein.

The following three sub-sections provide an overview of how OSEC meets the requirements of participation as a genuine interest intervener, in addition to being directly and aversely affected.

1) Provide a concise explanation of how your participation will materially assist the AER in making a decision on the application (e.g., you can provide project-specific, detailed technical information).

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Since the Public Notice of Application in late September, OSEC has been actively reviewing the proposed Imperial tailings management plan. The Pembina Institute's review of the Modified Project have included both detailed technical analyses of the proposed TMP and comparative analyses from an industry-wide tailings management perspective. The products of both analyses are expected to contribute meaningfully in assisting the AER's decision making process for this application. The preceeding Statement of Concern provides an overview of the nature of OSEC's research, analysis, and perspectives on this file.

2) Provide a concise explanation of how you have a tangible interest in the subject matter of the review (e.g., you participate on committees or are involved in other activities related to oil sands tailings).

For over 30 years members of OSEC have demonstrated a genuine interest in promoting sustainable development in Northern Alberta, overseeing responsible oilsands exploration and development, and managing the cumulative environmental impacts of oilsands mining.

In particular, the Pembina Institute's experience in researching and reporting on Alberta oilsands tailings includes: five major technical research publications on tailings management from 2008-2013; leadership in designing and facilitating multi-stakeholder initiatives intended to manage cumulative impacts of tailings; participation in numerous government consultation processes, including processes specific to tailings; membership in the AER's 2015-16 Technical Advisory Committee for Tailings Regulatory Management; and participation in the 2016 Water Management Working Group hosted by the Government of Alberta.

3) Provide a concise explanation of how your participation will not unnecessarily delay the review.

OSEC has earned a reputation for providing substantive and well-researched perspectives that add value to regulatory processes. Members of OSEC are routinely contacted by media, industry,

and governments both in Canada and abroad for comments and insights that are highly credible, well-researched, and fair.

The principle objective of OSEC for participating in the review of this application is to ensure that concerns are addressed in the most comprehensive and efficient manner possible. Correspondingly, OSEC is currently in bilateral discussions with the AER to promote the adoption of ADR processes and forums at an industry-wide level, in order to prevent unnecessary interferences with the regulator's concurrent review of all D085 applications.