

## Hautfenne-Jewer, Celia

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**From:** Tran, Nhan  
**Sent:** April 10, 2025 2:49 PM  
**To:** McAllister, Andrew  
**Cc:** Posada, Lester  
**Subject:** Pol 3 workplan and presentation to SMRLC  
**Attachments:** #7498901-POL\_3\_Workplan\_SMRLC\_Deck\_-\_April\_28\_2025.PPTX.DRF; #7489764-Pol\_3\_Objective\_Workplan.doc.DRF

**Follow Up Flag:** FollowUp  
**Flag Status:** Completed

Hey Andrew,

Attached are the Pol 3 work plan and associated presentation to SMRLC for your review and approval. The workplan has been reviewed by the team and everyone is on board with it; the presentation aligns with the work plan but wasn't shared with the team.

Deadline for submission is April 16 (next Wednesday), so please let us know if you have any comments or feedback for us in the next few days and we'll get those changes made to send it in.

Thanks,  
Nhan

***Nhan Tran***

**Acting Director/Directeur par interim**

**Reconciliation Policy and Public Programs Division/ Division de la politique sur la réconciliation et des programmes publics**

Canadian Nuclear Safety Commission/Commission canadienne de sûreté nucléaire

Cel: (343) 542-9173

[nhan.tran@cnsccsn.gc.ca](mailto:nhan.tran@cnsccsn.gc.ca)

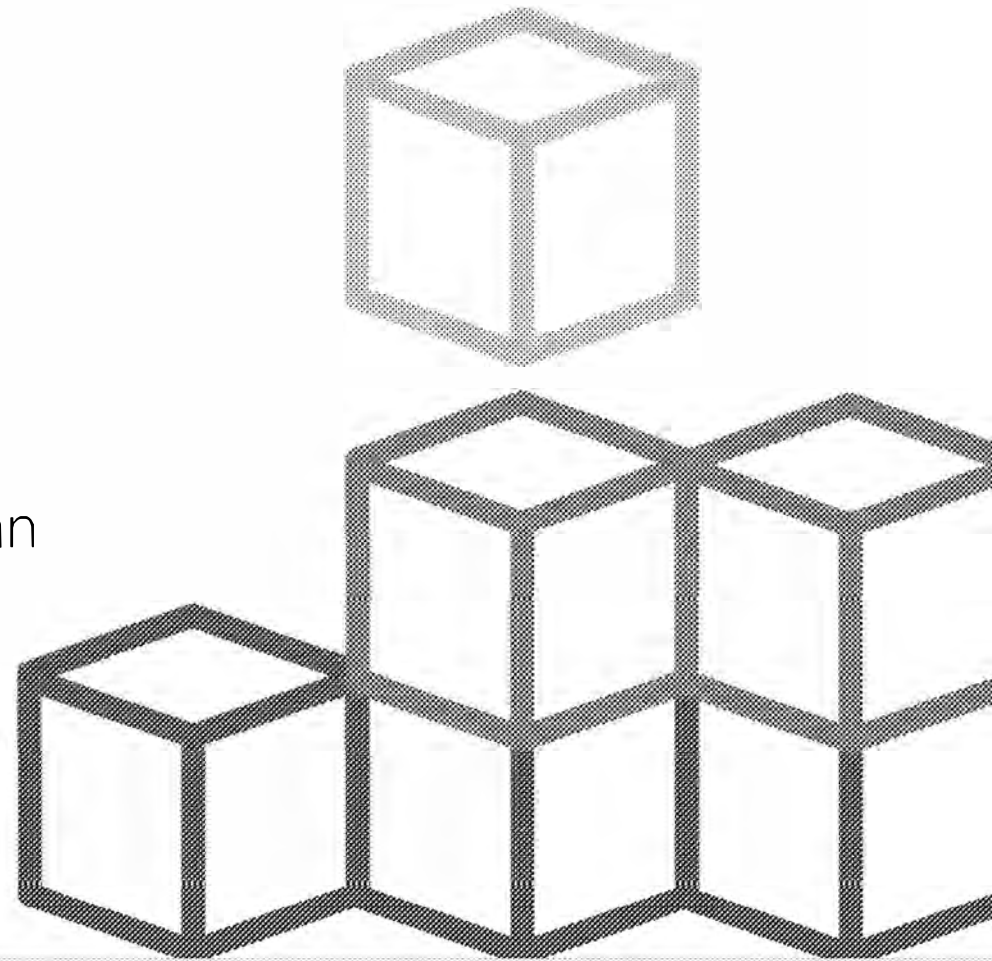
Please don't feel obligated to respond outside of your regular work hours.  
Ne vous sentez pas obligé de répondre en dehors de vos heures de travail habituelles.

# POL.3: Enrichment

SMR Leadership Committee Workplan  
Endorsement

Prepared by: Nhan Tran / Lester Posada

e-Doc 7498901



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

# Purpose

- To provide CNSC management with an overview of the POL.3 workplan including scope, detailed deliverables, assumptions, exclusions, milestones, and overall schedule.
- Provide an avenue for management to provide feedback on the POL.3's workplan.
- **Ultimately, to seek endorsement of the workplan.**

# POL.3 Scope

1. Develop a high-level workplan that includes project milestones/timelines.
2. Support policy analysis and/or development on fuel enrichment in Canada, in collaboration with federal partners.
3. Review CNSC's current requirements and guidance on fuel enrichment. Ensure alignment with #2.
4. Review CNSC staff's current capabilities in conducting reviews of licenses seeking authorization related to fuel enrichment, and for the production and/or use of enriched nuclear fuel; and determine if improvements to regulatory framework, operating experience, training, and guidance on technical assessments is required.
5. Develop and publish an internal report which documents the analysis (based on #3 & #4), identifies all items which require further development and provides recommendations. Leverage existing CNSC processes, as required, to perform the analysis and issue the required information.
6. Ensure CNSC readiness to regulate fuel enrichment by initiating Implementation of the identified recommendations into existing CNSC managed process. This is considered complete when the recommendations are entered into a managed process.

# POL.3 Deliverables

## Deliverable 1.

### **Internal memos and/or reports documenting results of the literature review, including:**

- Key process steps involved with enrichment technologies and applications considered.
- Applicable Canadian legislations, associated regulations and prevailing policies/processes including standards and requirements and any upcoming changes.
- International commitments, prevailing policies/processes, regulations in other countries pursuing enrichment, import/export restrictions (domestic and multilateral) and related challenges.

## Deliverable 2.

### **Internal memos and/or reports documenting results of analysis, including:**

- Legislative, regulatory, policy readiness and any associated gaps/improvements.
- OPEX and gaps related to OPEX dealing with pre-licensing, licensing and compliance verification processes.
- Impact of deployment on staff capacity and training needs.
- Potential impact of deployment related to safeguards/non-proliferation in Canada and any associated changes needed.
- Impact of deployment to consent based processes and outreach.

## Deliverable 3.

### **An internal report which documents the results of objectives, identifying all items which require further development and provide recommendations.**

- Content of the report will be shared with other government agencies to facilitate policy analysis
- Approach towards sharing of results / recommendations developed in consultation with NRCAN

# Assumptions & Exclusions

- While the objective will scan all available fuel enrichment approaches and technologies, the analysis will focus on the most likely proposals/applications for fuel enrichment in the Canadian context.
- Risks related to prioritization of resources to ensure alignment with #2 from the scope (support policy analysis and/or development on fuel enrichment in Canada, in collaboration with federal partners) will be dealt with outside of this project.
- Project team members represent Directorates and will be able to pull in additional resources/expertise as needed to ensure support for project. Any prioritization/additional resource request will be dealt with through the SMR hub.
- Final report will be an internal report.
- No exclusions to note.

# Objective Schedule

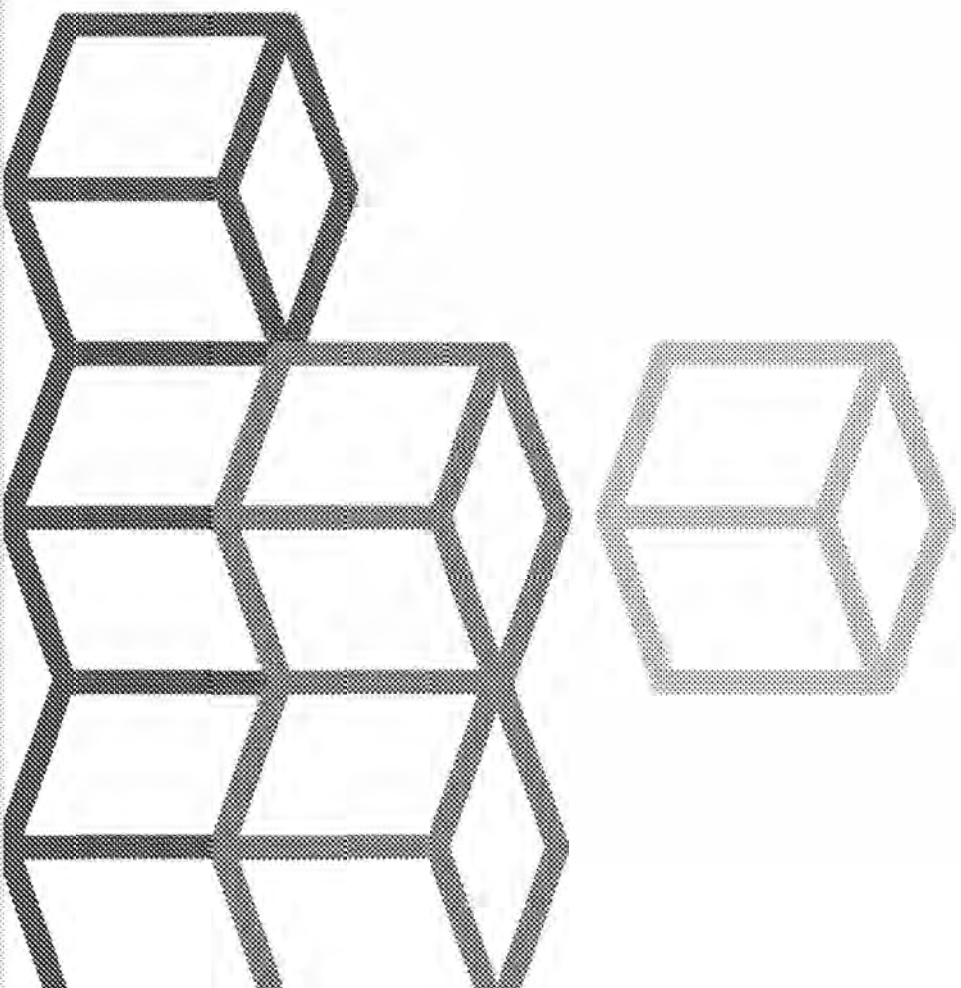
Milestone or Deliverable	Responsible	Completion Target
Reprioritized project kickoff / Restart	N. Tracy / SPAR Hub	March 2025
Work Plan developed	POLJ team	April 2025
Present Work Plan to SMF Leadership Committee for endorsement	POLJ team / SMFGL	April 2025
Complete Deliverable 1	POLJ team	July 2025
50% Complete		
Complete Deliverable 2	POLJ team	September 2025
75% Complete		
Complete Deliverable 3	POLJ team	November 2025
Close out Objective	N. Tracy / SMF Hub	December 2025
100% Complete		



## Objective Team's Request

**SMR Leadership Committee voting members are requested to endorse the workplan.**

# Questions?



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

## Hautfenne-Jewer, Celia

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**From:** Amalraj, Julian  
**Sent:** October 23, 2024 12:56 PM  
**To:** Posada, Lester; Steedman, Gavin; Sivekumar, Dylan; Brunarski, Lee; Cochrane, Chris; Hamlat, Said; Khotylev, Vladimir; Henley, Tessa  
**Cc:** McAllister, Andrew; Tran, Nhan; Tabikh, Tarek  
**Subject:** POL. 4 Reprocessing meeting hohghlights from OCT 23, 2024  
**Attachments:** #7241672-Memo\_-\_Background\_on\_Reprocessing\_Technologies.DOCX.DRF; #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.DOCX.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7270992-POL\_4\_reprocessing\_team\_meeting\_.MSG.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7382690-RE\_POL\_4\_team\_meeting\_highlight\_(June\_18\_2024).MSG.DRF; #7382695-Re\_POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF\_-\_Work\_plan\_contributions\_.MSG.DRF; #7385982-POL\_4\_Objective\_Workplan\_.doc.DRF; #7202556-SMR\_Readiness\_-\_POL\_4\_-\_Reprocessing.ZZZ.DRF

**Importance:** High

Hello Pol.4 team,

Thank you all for attending today's meeting.

Key highlights,

- Restart after prioritization started Oct 16, th. This was a follow up meeting.
- We reviewed a draft work plan (attached herewith). To go for SMRLC endorsement in November.
- Preliminary work on technologies scan and process steps on reprocessing available (attached herewith). Lester and Dylan will be working on this the next two weeks to get them updated.
- Regulatory framework, applicable legislations, policy aspects in each areas to come from individual team members.
- As suggested a good place to start would be REGDOC 1.2.2 and go from there.
- Discussed assumption about focusing on "likely" proposals in the Canadian context. Discussed phase deliverables as memo/mini reports.
- We discussed kickstarting the literature review portion of the project asap while approval for the project is going on in parallel during november.
- Julian to reach out to Vladimir and get DAA on board in terms of resources and support. If any other team members have resource constraints or support needed from your directorate, please advise.
- Will also touch base with Gavin separately.
- Targeting to have literature review done by Jan, 2025.

I have attached a working folder for use by team members here. This folder has all the relevant documentation as currently used. Please use this or link it to your working folder so that we may keep al materials in one place with proper access rights.

Weekly meetings going forward (invitations sent out already). Any questions, please ping me.

Thank you all,

Julian

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**From:** Amalraj, Julian

**Sent:** October 16, 2024 9:13 AM

**To:** Posada, Lester <lester.posada@cnsccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnsccsn.gc.ca>; Sivekumar, Dylan <dylan.sivekumar@cnsccsn.gc.ca>; Brunarski, Lee <lee.brunarski@cnsccsn.gc.ca>; Cochrane, Chris <chris.cochrane@cnsccsn.gc.ca>; Hamlat, Said <said.hamlat@cnsccsn.gc.ca>; Khotylev, Vladimir <vladimir.khotylev@cnsccsn.gc.ca>

**Subject:** Attached Files - POL. 4 Reprocessing Kick start

Hello POL. 4 team,

Please see attached review material for today's meeting. As earlier indicated, this will be our kickstart for this project. I expect to get the work plan completed before end of October and have the project run its normal course.

Planning to have weekly meetings. Please come prepared to answer a few questions for me.

- Expected timeframes :
  - o Literature review (Oct-Jan, 2025)
  - o Analysis (Feb, 2025)
  - o Reporting/Review/Consultations (Mar-May, 2025)
  - o Project complete by Jun, 2025.
- Time / support from your Directorate/Divisions to complete the project on time.
- Alternates if you have identified any.
- Dedicated time every week to meet and discuss progress.
- How do we consult/engage other government agencies in our work.

Julian

## Hautfenne-Jewer, Celia

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**From:** Gilbeau, Amanda <amanda.gilbeau@nrcan-rncan.gc.ca> on behalf of Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>  
**Sent:** October 7, 2024 2:47 PM  
**To:** Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; Kim,Duck (ECCC); jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; Elizabeth.White-Senack@ised-ised.gc.ca; Nourallah, Laura (ISED/ISDE; Reinholz, David; Kent, Michael; Henley, Tessa; Amalraj, Julian; Prosser, Kathleen; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; Dalzell, Matthew (PrairiesCan; Ballantyne, Anne (PrairiesCan; Rosaasen, Canute (PrairiesCan)  
**Cc:** Aina, Ifedotun; Anderson, Emma (she, her | elle, la); Boyle, Kellie; Calvert, Tom; Gilbeau, Amanda; Goulding, Liam; Kenney, Jason; Samuel, Aisha; Temnikov, Dimitri; Wesseling, Emily (she, her | elle, elle); Wilkinson, David (he, him | il, lui)  
**Subject:** Enrichment and Reprocessing Working Groups Timeline Updates  
**Attachments:** 1 - Technology Summary.docx; 2 - Supply and Demand for Uranium and the Implications of Different Fuel Cycles.docx; 3 - Environmental Effects (+Waste).docx; 4 - Economic Benefits and Costs.docx; 5 - Domestic Regulatory Environment.docx; 6 - Energy Security and Industrial Development.docx; 7 - Non-Proliferation and Safeguarding, Import and Export Control Considerations.docx; 8 - International and Regional Relations on Reprocessing.docx; 9 - Indigenous and Host Community Considerations.docx

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

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EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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PROTECTED A - PROTÉGÉ A

Dear colleagues,

I hope that this email finds you well. As you may be well aware, with Orano's recent announcement, the priority of the enrichment working group has shifted. This work is still important to NRCan in the long term and as such, we are proposing to proceed with both the enrichment and reprocessing working groups (WG) in parallel, with adjusted timelines, aiming to finalize both by April 2025.

NRCan will soon send out invitations for kickoff meetings for the WG criteria we lead. We encourage the leads of each criteria to schedule their kickoff meetings as well. We hope these criteria meetings will foster thoughtful discussion and collaboration.

For the reprocessing working group, the templates are here. You are encouraged to customize the template as needed. Please note that the templates for the enrichment working group were shared via email on August 27, 2024.

If you have any questions or concerns, please reach out.

Thank you for your patience and flexibility.

Kind regards,  
Pui Wai

## Technology Summary

LEAD DEPARTMENT: Natural Resources Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### PUREX REPROCESSING

### MOLTEN SALT ELECTRO-REFINING

### OXIDE ELECTROWINNING PROCESS

### FLUORIDE VOLATILITY PROCESS

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## Supply And Demand for Uranium and the Implications of Different Fuel Cycles

LEAD DEPARTMENT: Natural Resources Canada  
SUPPORTING DEPARTMENT: Global Affairs Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

Canada is a leader in uranium production, fuel supply (refinement/ conversion/ fabrication), and nuclear energy and technology, and has considerable existing uranium mining and milling capacity.

Canada's nuclear power industry has been self-reliant for decades by virtue of its vertically integrated domestic fuel and technology supply chain. This was most evident during the COVID pandemic and recently following the invasion of Ukraine. Most operating nuclear power reactors in the world and most prospective small modular reactors (SMRs) are/will be fueled by enriched uranium. Canadian CANDU nuclear reactors are an exception as they are fueled by unenriched “natural” uranium.

Globally, there are reactors that utilize reprocessed used nuclear fuel as fuel. These can serve as secondary supplies and offset the demand for fresh fuel – be it natural or enriched uranium products. In general, reprocessing can be beneficial for countries with limited uranium supplies, as they are able to make use of unspent energy in nuclear fuels that have already been used once in nuclear reactors. This can provide security of supply and is generally built into national policy frameworks.

The invasion of Ukraine has raised concerns about the security of the global nuclear fuel supply and put significant upward pressure on prices, which have increased 50% (highest since 2011).

### CANADIAN URANIUM AND FUEL SUPPLY

Canada has historically held ample supply of domestic uranium resources, and so reprocessing was never deemed necessary nor cost-effective as a means of providing fuel for the reactor fleet. In 2021, 10% of the world's uranium was mined in Canada. Canada is the second largest uranium producer in the world, with production worth \$500M (2021). Of the uranium mined in Canada in 2021, 69% was exported for use in foreign nuclear power reactors and 31% used to fuel Canadian nuclear power reactors.<sup>1</sup>

At the current levels of production and price, Canadian uranium deposits will last for another forty years.<sup>2</sup> There are known uranium resources of 694,000 tonnes of U3O8 (588,500 tU), but this is estimated to be higher with continuing exploration.<sup>3</sup> Estimates indicate that Canadian uranium yield rates are 10 to 100 times superior to those in other uranium producing countries.<sup>4</sup>

<sup>1</sup> From Energy Fact Book 2022-2023.

<sup>2</sup> Canadian Energy Security - Canada.ca

<sup>3</sup> Uranium in Canada | Canadian Uranium Production - World Nuclear Association (world-nuclear.org)

<sup>4</sup> Canadian Energy Security - Canada.ca

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Canada can expand uranium mining, but uranium refining and conversion facilities are nearing capacity and require capital investments and lengthy regulatory approvals to expand, with some site-specific limitations.

At this time, all operating uranium mines and mills in Canada are located in northern Saskatchewan. Orano Canada (formerly Areva Resources Canada) and Cameco Corporation are the licensees of the active mining and milling facilities.

The active mining and milling facilities include:<sup>5</sup>

- Cigar Lake Mine
- Key Lake Mill
- McArthur River Mine
- McClean Lake Mill
- Rabbit Lake Mine and Mill

**Table 1. Annual uranium production in Canada (tonnes U)**

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
McArthur River	7744	7356	7354	6928	6193	76	0	0	0	423
Cigar Lake	0	132	4345	6666	6925	6925	6925	3885	4693	6928
McClean Lake	0	43	0	0	0	0	0	0	0	0
Rabbit Lake	1587	1602	1621	428	0	0	0	0	0	0
<b>Total</b>	<b>9331</b>	<b>9134</b>	<b>13,320</b>	<b>14,022</b>	<b>13,116</b>	<b>7001</b>	<b>6925</b>	<b>3885</b>	<b>4693</b>	<b>7351</b>
<b>cf. World</b>	<b>59,331</b>	<b>56,041</b>	<b>60,304</b>	<b>63,207</b>	<b>60,514</b>	<b>54,154</b>	<b>54,742</b>	<b>47,731</b>	<b>48,332</b>	<b>48,888</b>

Source: World Nuclear Association<sup>6</sup>

Proposed uranium mining and milling projects:

- Wheeler River, Denison Mines Corporation
  - Proposing to develop an operation that would produce up to 5,400 tonnes of uranium oxide annually for 20 years.
- Rook I, NexGen Energy Ltd.
  - The proposed Rook I project includes underground and surface facilities to support the mining and processing of uranium ore. The main components include an underground mine, an onsite mill to process an average of 1,400 tonnes of ore per day, surface facilities to support the short- and long-term storage of waste rock and ore, an underground tailings management facility, water-handling infrastructure and an effluent treatment circuit, and additional infrastructure to support mining activities.

Currently, there are 5 licensed uranium processing and fuel fabrication facilities operating in Canada:<sup>7</sup>

- Blind River Uranium Facility (Canada's only refining facility)

<sup>5</sup> [Uranium mines and mills \(cnsccsn.gc.ca\)](https://www.cnsccsn.gc.ca/uranium-mines-and-mills)

<sup>6</sup> [Uranium in Canada | Canadian Uranium Production - World Nuclear Association \(world-nuclear.org\)](https://www.world-nuclear.org/uranium-in-canada/)

<sup>7</sup> [Uranium processing and fuel fabrication \(cnsccsn.gc.ca\)](https://www.cnsccsn.gc.ca/uranium-processing-and-fuel-fabrication/)

Commented [PK3]: add a core summary of current fleet and utilization volumes.

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- Port Hope Conversion Facility (Canada’s only conversion facility)
- Cameco Fuel Manufacturing Inc.
- BWXT Nuclear Energy Canada Inc. - Toronto
- BWXT Nuclear Energy Canada Inc. - Peterborough

CANADIAN URANIUM AND FUEL DEMAND

To date, given Canada’s large high-grade uranium deposits, the low price of uranium, and the high cost of reprocessing spent fuel, the nuclear industry has not deemed it necessary nor cost-effective to reprocess spent fuel for Canada’s reactors.

To better understand future uranium needs, Natural Resources Canada solicited projections from SMR vendors and utilities on their anticipated deployments, and generated data based on planned reactors from others who were not willing to provide projections, based on the IAEA SMR Booklet 2022 with technical specifications.

The projections consider deployments across ON, NB and SK between now and 2040 (Table 2). These projections do not include enriched fuel required for light water reactors should Ontario build any Westinghouse AP-1000s (LEU) or France’s EPR-1200s (LEU), nor possible E-Vinci microreactor deployments (HALEU). Table 3 provides different scenarios for enriched fuel demand (HALEU, LEU+ and LEU) related to different deployment timelines presented by key industry participants, for small reactors for projects across ON, NB, and SK.

Commented [PK4]: add here some information projected future demand WFP - 2028 on 23

Table 2. Reactor deployments that underpin the fuel projections

Province, Reactor type, Location		Operation	Date Fuel Required (estimated)
<b>Ontario</b>			
USNC - GFP-1	Chalk River	2028	2026
BWRX-300	Darlington-1	2028	2026
BWRX-300	Darlington-2	2031	2029
BWRX-300	Darlington-3	2033	2031
BWRX-300	Darlington-4	2034	2032
<b>Saskatchewan</b>			
BWRX-300	Sask-1	2034	2032
BWRX-300	Sask-2	2036	2034
BWRX-300	Sask-3	2038	2036
BWRX-300	Sask-4	2040	2038
<b>New Brunswick</b>			
ARC-100	Point Lepreau	2032	2028
ARC-100	Point Lepreau	2034	2030
<b>Industrial Applications</b>			
USNC-GFP-2	McMaster	2033	2029

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USNC-GFP-3	North Application	2035	2031
USNC-GFP-4	North Application	2036	2032
USNC-GFP-5	North Application	2037	2033
Xe-100	TBD	2032	2028
Xe-100	TBD	2033	2029
Xe-100	TBD	2037	2033

**Table 3. Fuel Composition by Reactor Type, indicating Previously or Currently Used Fuels (o), and Proposed or Theoretical Fuels (x).**

Reactor Type	Natural U	Enriched U*	Reprocessed U**	MOX	Other Fuels†
PWR		o	o	o	
PHWR	o	o	o	x	x
BWR		o	x	x	
HTGR		o		x	o
MSR		o	x	x	o
SFR		o		o	x
GCR/AGR	o	o			
Heat Pipe Microreactor		x			x

\*Enriched uranium: including LEU (Low-Enriched Uranium, up to 5%), LEU+ (Low-Enriched Uranium Plus, between 5 – 10%), and HALEU (High-Assay Low-Enriched Uranium, between 5% and 20%)

\*\*Reprocessed Uranium fuels may include down blended natural uranium equivalents or re-enriched fuels. Reprocessed uranium composition depends on initial enrichment, but frequently has less than 1% U-235. Reprocessed uranium may be contaminated with traces of fission products and transuranics.

† Other fuels describe fuels not included in Natural U, Enriched U, Reprocessed U, or MOX categories, and fuels using non-standard materials, such as thorium-based fuels, composite fuels, metal alloy fuels, etc.

**Pressurized Water Reactor (PWR)** technologies typically make use of uranium dioxide UO<sub>2</sub> powder that is sintered into hard ceramic pellets typically enriched between 3 and 5% U-235. Some reactors can make use of reprocessed uranium or MOX fuels.

**Pressurized Heavy Water Reactors (PHWR)** of the CANDU type (large-scale nuclear currently deployed in Canada) typically use natural uranium (0.7% U-235) based sintered pellets. Studies have demonstrated that CANDU type reactors could use reprocessed U from LWRs or slightly enriched U (e.g., low-void reactivity fuel, LVRF). MOX-type fuel has been tested in research reactors. The design for the AWHR-300 in India is proposed to use thorium-based fuels, such as Th/U and Th/Pu MOX-type.

**Boiling Water Reactor (BWR)** technologies use fuels similar to PWRs, with fuels typically enriched to near 2.4% U-235.

**High Temperature Gas Reactors (HTGR)** are currently expected to use uranium-based oxides or carbides with HALEU at <20% U-235, but could make use of other alternative and recycled fuels, including U-Pu, Pu, MOX, and U-Th.

**Molten Salt Reactors (MSR)** can use a wide range of fuels, although the reference fuel salt is typically a molten mixture of lithium and beryllium fluoride (FLiBe) with dissolved low-enriched uranium (U-235)

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fluoride (UF4). MSRs may make use of spent fuel from other reactors, mixed uranium/plutonium oxide fuels, or other fuels including Th and U-233.

**Sodium Fast Reactors (SFR)** are currently expected to use uranium-based fuels, either in a mixed oxide form (MOX), U fuels with U-235 between 5 – 20%, or mixed metal alloys. Operational SFR in Russia have used enriched U or reprocessed U in their fuels.

**Gas Cooled Reactors (GCR)** can use UO<sub>2</sub> fuel with U-235 typically between 2.5% – 3.5%. The Magnox reactors (UK) used natural uranium.

**Heat Pipe Microreactors (HPR)** are microreactor designs which could use HALEU up to 19.75% U-235 in some designs, or Ceramic metal composite (CERMET) fuel with dispersed UOX, UN, or UC kernels dispersed, e.g., W-UC CERMET fuel.

**Table 4. Projected Canadian Demand for Enriched Fuel**

TIMELINE	ENRICHED FUEL* (in tonnes)		
	HALEU	LEU+	LEU
Until 2030	34 to 51	2 to 36	≈ 120
Until 2035	64 to 81	2 to 36	≈ 495

\*HALEU: High-Assay Low-Enriched Uranium, enriched between 5% and 20%.  
 LEU+: Low-Enriched Uranium Plus, enriched between 5 – 10 %.  
 LEU: Low-Enriched Uranium, enriched up to 5%.

GLOBAL URANIUM SUPPLY AND DEMAND

Currently, some 60,000 tonnes of uranium are required annually to fuel the world's 410 operating nuclear power reactors. However, with countries increasingly expected to turn to nuclear power to address climate change, energy security and sustainable development, demand could be as high as 100,000 tonnes of uranium per year by 2040. That would require a near doubling of uranium mining and processing from current levels.<sup>8</sup>

Mines in 2021 supplied some 56,961 tonnes of uranium oxide concentrate (U3O8) containing 48,303 tU, 77% of the utilities' annual requirements. The balance is made up from secondary sources including stockpiled uranium held by utilities, and in the last few years of low prices those civil stockpiles have been built up again following their depletion over 1990-2005. Nuclear fuel supply may be from secondary sources including recycled uranium and plutonium from used fuel, as mixed oxide (MOX) fuel.<sup>9</sup>

In December 2023, at the 28th Conference of the Parties (COP28) to the United Nations Framework Convention in Dubai, 22 countries, including Canada, agreed to triple global nuclear power capacity by 2050 to help reach global net-zero emissions.

<sup>8</sup> IAEA Symposium Examines Uranium Production Cycle for Sustainable Nuclear Power | IAEA  
<sup>9</sup> Uranium Markets: World Nuclear Association - World Nuclear Association (world-nuclear.org)

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*Russian Impacts*

Close allies, including the U.S., U.K., E.U., and France, rely on nuclear to power their economies, and view nuclear as key to advancing their climate plans. Considering Russian aggression, energy security and nuclear fuel supply chains have taken on greater geopolitical importance.

European countries have also indicated they will extend or increase the use of nuclear power to reduce reliance on Russian coal and natural gas for generating electricity.

**Table 5. Global nuclear supply and Russian supply**

	<i>% of electricity supplied by nuclear power</i>	<i>% of nuclear fuel supplied by Russia</i>
<i>E.U.</i>	25%	~25%
<i>U.S.</i>	20%	~20%
<i>France</i>	69%	~20%
<i>U.K.</i>	15%	?
<i>Canada</i>	15%	0%

## GLOBAL REPROCESSING

Used nuclear fuel has long been reprocessed to extract fissile materials for recycling and to reduce the volume of high-level wastes. Several European countries, Russia, China and Japan have policies to reprocess used nuclear fuel, although government policies in many other countries do not see used fuel as a resource but rather a waste.<sup>10</sup>

**Table 6. Key commercial reprocessing facilities globally**

<b>Facility</b>	<b>Country</b>	<b>Company</b>	<b>Method</b>	<b>Reprocessing Capacity (tonnes/year)</b>
La Hague	France	Orano	PUREX	1600
RT-1 (Mayak)	Russia	Rosatom	PUREX	400
PREFRE (Tarapur)	India	NPCIL	PUREX	200
Kalpakkam	India	NPCIL	PUREX	100
Rokkasho	Japan	JNFL	PUREX	800

<sup>10</sup> [Processing of Used Nuclear Fuel - World Nuclear Association \(world-nuclear.org\)](https://www.world-nuclear.org/information-library/industrial-and-transportation/nuclear-fuel-cycle/processing-of-used-nuclear-fuel.aspx)

## Environmental Effects (+Waste)

LEAD DEPARTMENTS: Environment and Climate Change Canada, The Canadian Nuclear Safety Commission

SUPPORTING DEPARTMENTS: Natural Resources Canada, Health Canada (pending the inclusion of human health)

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

#### REPROCESSING TECHNOLOGY WASTE STREAMS

- What are the unique waste streams with reprocessing technologies:
  - (1) PUREX reprocessing
  - (2) molten salt electro-refining
  - (3) oxide electrowinning process
  - (4) fluoride volatility process

#### WASTE STREAM SOLUTIONS

- What solutions does Canada have in place for these waste streams?

#### ENVIRONMENTAL IMPACTS

- What novel environmental impacts would we expect from a reprocessing facility (vs. existing fuel cycle facilities)?
  - High level liquid waste in large volumes for example, would be problematic under current framework [NWMO DGR for CANDU bundles]
- Do we currently have [proposed] solutions in place for any of the waste forms?
  - Impacts of a closed, domestic, fuel cycle vs:
    - Once through
    - Closed
  - What are international examples?

## SUSTAINABLE DEVELOPMENT GOALS

- How would reprocessing of used fuel contribute to sustainable development goals (open vs. closed cycles)?
  - What amount of waste would be generated/diverted?
  - What amount of uranium would be diverted?

DRAFT

## Economic Benefits and Costs

LEAD DEPARTMENT: Natural Resources Canada

SUPPORTING DEPARTMENTS: Environment and Climate Change Canada, Innovation, Science and Economic Development Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### ECONOMIC BENEFITS

- Cost savings from not disposing of used nuclear fuel
- Jobs, economic benefits
- Fuel security
- Sale price of material
- Domestic and export markets

### COSTS

- Labour force requirements
- CapEx and OpEx (benchmark with international examples where possible)
- Taxation
- IP payments as necessary
- Opportunity costs (alternatives, e.g. enrichment, others?)
- Regulatory resources cost

Commented [W61]: Dave: Given other papers address environmental, regulatory, indigenous considerations, etc., I think we can the focus of this one on economic/financial benefits and costs. A Drafted "Cost-Benefit Analysis" would actually take everything into account and I don't think that's what we want to do here. Perhaps at a later stage, if needed. Therefore, suggest sections and subsections more similar to as follows:

Economic Benefits:  
 - Cost savings from not disposing  
 - Jobs, economic benefits  
 - Export opportunity  
 - Fuel security

Costs:  
 - Labour force requirements  
 - CapEx and OpEx (benchmark...)  
 - Taxation  
 - IP payments as necessary  
 - Opportunity costs (alternatives, e.g. enrichment/ others?)  
 - Regulatory resources cost

May fit it up that this paper overlaps with others, but this is ok.

POTENTIAL GOVERNMENT ROLE

- What assurances do investors need from the GOC to consider funding to the needed level to develop the technology?
- Do the needs of the nuclear industry require/suggest that there exists a demand for these government assurances? Is there a reason the government should consider providing incentives to investors of such a project?

Commented [WD2]: Suggest changing title to Potential Government Role

DRAFT

## Domestic Regulatory Environment

LEAD DEPARTMENT: Canadian Nuclear Safety Commission

SUPPORTING DEPARTMENT: Natural Resources Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### CURRENT REGULATORY FRAMEWORK

- Does the CNSC already have the expertise to regulate?
  - What additional capacity would the CNSC need?
    - NRCAN?
    - GAC?
    - IAAC?
- What parts of the current regulatory framework impact reprocessing?
  - NSCA
  - IAA
  - Reg docs
  - CSAs

### KEY REGULATORY FRAMEWORK GAPS

- Key gaps in Canada's regulatory frameworks for reprocessing.

### ADDITIONAL REQUIRED SUPPORT

- What additional capacity would we anticipate being needed at implicated departments and agencies to support this technology in Canada?

## Energy Security and Industrial Development

LEAD DEPARTMENT: Natural Resources Canada

SUPPORTING DEPARTMENT: Global Affairs Canada, Innovation, Science, Economic Development Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

#### CANADA'S NUCLEAR ENERGY AND TECHNOLOGY INDUSTRIAL STRATEGY

- How would reprocessing fit/contribute to Canada's overall objectives for its nuclear sector?

#### ENERGY SECURITY

- Future energy needs
- Non-emitting energy needs
  - How do these interface with nuclear deployment?
  - What gaps identified in the supply and demand section can be addressed?

#### REACTOR TYPES THAT WOULD SUPPORT THE USE OF RepU

- Identify scenarios in the long term where we might expect reprocessing to be beneficial to Canada (how many reactor deployments domestically/internationally)

## Non-Proliferation and Safeguarding, Import and Export Control Considerations

LEAD DEPARTMENTS: Global Affairs Canada, Canadian Nuclear Safety Commission

SUPPORTING DEPARTMENT: Natural Resources Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### POTENTIAL CHANGES TO CANADA'S SAFEGUARDING AND NON-PROLIFERATION PROGRAMS

- What would the deployment of reprocessing change for Canada's safeguarding and non-proliferation programs

### COSTS

- Costs of inspections and associated costs to the sector

### IMPORT AND EXPORT REGIME

- Canada's import and export regime, and what would it take to import or export material and/or technologies?

### IMPLICATIONS FOR THE LIST OF NUCLEAR DUAL USE ITEMS

## International and Regional Relations on Reprocessing

LEAD DEPARTMENTS: Natural Resources Canada, Global Affairs Canada

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### PROVINCIAL UPTAKE

- What provinces would consider this and for what reasons?
  - What do the provinces want/need from the GOC?

### INTERNATIONAL COMMITMENTS

- Implications for the Canada's international commitments – including non-proliferation
  - Implications for the joint convention
  - Implications within the broader G7 community
    - Japan's contracts with the UK to reprocess fuel in the UK have been terminated
    - Japan's plant is not yet running
    - UK has stopped reprocessing
    - France still has active contracts

### OTHER INTERNATIONAL IMPORTANCE

- Impact on other areas of international importance

## Indigenous and Host Community Considerations

LEAD DEPARTMENTS: Environment and Climate Change Canada, Natural Resources Canada

SUPPORTING DEPARTMENT: Health Canada

CONSULTED: Canadian Nuclear Safety Commission

Commented [701]: "Consulted" is the final way of saying

### SUMMARY

[key highlights and considerations for policy makers – max half a page]

### BACKGROUND

### COMMUNITY NEEDS

- What would the needs of a host community and local Indigenous community be should this technology be deployed?

### CURRENT DEMAND

- Are any communities seeking the deployment of this technology?

### ANTICIPATED CHALLENGES

- What challenges would we anticipate from the wider public?

## Hautfenne-Jewer, Celia

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**Subject:** POL.4 reprocessing team meeting  
**Location:** Microsoft Teams Meeting

**Start:** Fri 2024-04-26 3:00 PM  
**End:** Fri 2024-04-26 4:00 PM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Organizer:** Amalraj, Julian  
**Required Attendees:** Henley, Tessa; Cochrane, Chris; Reinholz, David; Kent, Michael; Brunarski, Lee; Lester Posada (CNSC/CCSN); Steedman, Gavin; Khotylev, Vladimir; Hamlat, Said; Sivekumar, Dylan; Prosser, Kathleen

Hi everybody,

Blocking time for our next meeting.

Comments on the POL. 4 OIF is due by this meeting. Please send me your proposed changes if any.

More on agenda will be sent later.

Julian

---

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## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** April 15, 2024 11:03 AM  
**To:** Henley, Tessa; Cochrane, Chris; Reinholz, David; Kent, Michael; Brunarski, Lee; Lester Posada (CNSC/CCSN); Steedman, Gavin; Khotylev, Vladimir; Hamlat, Said; Sivekumar, Dylan  
**Cc:** Prosser, Kathleen; McAllister, Andrew  
**Subject:** RE: POL.4 reprocessing team meeting (April 15, 2024)  
**Attachments:** #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.DOCX.DRF

Dear POL.4 team members,

Today at our team meeting:

- We discussed initiation of POL.4 as well as some timelines/next steps.
- New team members include Dylan and Said. Meetings will have the Working group members as well to ensure alignment.
- Will target Late May / Early June for workplan and approval by SMRLC. Coordinated with NRCAN timelines
- Task code for use will be \*89NNN-OBJ.
- We reviewed the OIF objectives as well as the extended criteria presentation from NRCAN on the Working group for reprocessing
- Provided comments on the presentation as feedback to NRCAN.

Actions from the meeting:

- Julian to set up next meeting in a week's time.
- Team members, please provide any comments you may have on the OIF initiation form and its contents by next meeting.
- Tessa to provide summary of comments to be sent to NRCAN.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

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Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
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-----Original Appointment-----

**From:** Amalraj, Julian  
**Sent:** Friday, April 5, 2024 10:09 AM  
**To:** Amalraj, Julian; Henley, Tessa; Cochrane, Chris; Reinholz, David; Kent, Michael; Brunarski, Lee; Lester Posada (CNSC/CCSN); Janzen, Emily; Steedman, Gavin; Khotylev, Vladimir; Hamlat, Said  
**Cc:** Sivekumar, Dylan; Prosser, Kathleen  
**Subject:** POL.4 reprocessing team meeting  
**When:** April 15, 2024 9:30 AM-10:30 AM (UTC-05:00) Eastern Time (US & Canada).  
**Where:** Microsoft Teams Meeting

Sending a new time / date as a lot of you are not able to make it this week . . . lets try early Monday morning. Please review the OIF and NRCAN objectives, I will also send a updated OIF with instructions for developing a workplan on individual topics . . .

Julian

---

New time and date . . . Trying to see if we can meet this week so that we can have a quick discussion on the OIFs and its alignment to NRCAN objectives . . .

---

Hello Pol.4 team members,

I am sorry I am bit late in calling this meeting (due to inspection and subsequent covid related absences). I notice that NRCAN has sent some of the information we requested on reprocessing, as well, as discussed earlier, I am sending you the OIF for your review and updates. Myself and Lee also met with NRCAN last week to get consensus on how CNSC will approach the deliverables for this effort.

With that in mind, at this meeting we can discuss next steps. Agenda includes:

- to discuss NRCAN's updated proposals,
- Update team on discussions with NRCAN and CNSC management direction on executing this work.
- Discuss updating OIF to support mandate set by the working group on reprocessing.
- Update and finalize the OIF for management approval and initiate developing a workplan.
- Discuss resource commitments.

See you all there.

Julian

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## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** October 23, 2024 12:56 PM  
**To:** Posada, Lester; Steedman, Gavin; Sivekumar, Dylan; Brunarski, Lee; Cochrane, Chris; Hamlat, Said; Khotylev, Vladimir; Henley, Tessa  
**Cc:** McAllister, Andrew; Tran, Nhan; Tabikh, Tarek  
**Subject:** POL. 4 Reprocessing meeting hohghlights from OCT 23, 2024  
**Attachments:** #7241672-Memo\_-\_Background\_on\_Reprocessing\_Technologies.DOCX.DRF; #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.DOCX.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7270992-POL\_4\_reprocessing\_team\_meeting\_.MSG.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7382690-RE\_POL\_4\_team\_meeting\_highlight\_(June\_18\_2024).MSG.DRF; #7382695-Re\_POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF\_-\_Work\_plan\_contributions\_.MSG.DRF; #7385982-POL\_4\_Objective\_Workplan\_.doc.DRF; #7202556-SMR\_Readiness\_-\_POL\_4\_-\_Reprocessing.ZZZ.DRF

**Importance:** High

Hello Pol.4 team,

Thank you all for attending today's meeting.

Key highlights,

- Restart after prioritization started Oct 16, th. This was a follow up meeting.
- We reviewed a draft work plan (attached herewith). To go for SMRLC endorsement in November.
- Preliminary work on technologies scan and process steps on reprocessing available (attached herewith). Lester and Dylan will be working on this the next two weeks to get them updated.
- Regulatory framework, applicable legislations, policy aspects in each areas to come from individual team members.
- As suggested a good place to start would be REGDOC 1.2.2 and go from there.
- Discussed assumption about focusing on "likely" proposals in the Canadian context. Discussed phase deliverables as memo/mini reports.
- We discussed kickstarting the literature review portion of the project asap while approval for the project is going on in parallel during november.
- Julian to reach out to Vladimir and get DAA on board in terms of resources and support. If any other team members have resource constraints or support needed from your directorate, please advise.
- Will also touch base with Gavin separately.
- Targeting to have literature review done by Jan, 2025.

I have attached a working folder for use by team members here. This folder has all the relevant documentation as currently used. Please use this or link it to your working folder so that we may keep al materials in one place with proper access rights.

Weekly meetings going forward (invitations sent out already). Any questions, please ping me.

Thank you all,

Julian

---

**From:** Amalraj, Julian

**Sent:** October 16, 2024 9:13 AM

**To:** Posada, Lester <lester.posada@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Sivekumar, Dylan <dylan.sivekumar@cnscccsn.gc.ca>; Brunarski, Lee <lee.brunarski@cnscccsn.gc.ca>; Cochrane, Chris <chris.cochrane@cnscccsn.gc.ca>; Hamlat, Said <said.hamlat@cnscccsn.gc.ca>; Khotylev, Vladimir <vladimir.khotylev@cnscccsn.gc.ca>

**Subject:** Attached Files - POL. 4 Reprocessing Kick start

Hello POL. 4 team,

Please see attached review material for today's meeting. As earlier indicated, this will be our kickstart for this project. I expect to get the work plan completed before end of October and have the project run its normal course.

Planning to have weekly meetings. Please come prepared to answer a few questions for me.

- Expected timeframes :
  - o Literature review (Oct-Jan, 2025)
  - o Analysis (Feb, 2025)
  - o Reporting/Review/Consultations (Mar-May, 2025)
  - o Project complete by Jun, 2025.
- Time / support from your Directorate/Divisions to complete the project on time.
- Alternates if you have identified any.
- Dedicated time every week to meet and discuss progress.
- How do we consult/engage other government agencies in our work.

Julian

## Hautfenne-Jewer, Celia

---

**From:** Steedman, Gavin  
**Sent:** August 8, 2024 2:39 PM  
**To:** Amalraj, Julian  
**Subject:** Re: POL.4. Fuel reprocessing, recycling, and waste OIF - Work plan contributions

Hello Julian,

Please see the workplan I have developed from my contribution to POL.4 for waste management.

1. Literature review,
  - Understanding the input/output streams of various reprocessing technologies
  - Review OPEX from reprocessing plants around the world, particularly for the generation and management of radioactive waste streams
  - Review the characteristics of radioactive waste produced by reprocessing
2. Analysis
  - Results from literature review will inform a waste-centric analysis of reprocessing.
  - Discussion about how the CNSC regulatory framework could be applied to the various waste streams produced by reprocessing facility.
  - Focus on the novel challenges posed by reprocessing waste and how/if this waste can fit within the constraints of Canada's nuclear waste strategy
3. Document/record results of analysis/documentation.
  - Document results from literature review and analysis
  - Share findings and results with colleagues

Thanks,

Gavin

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Wednesday, August 7, 2024 11:39 AM  
**To:** Hamlat, Said <Said.Hamlat@cnscccsn.gc.ca>; Khotylev, Vladimir <Vladimir.Khotylev@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Sivekumar, Dylan <Dylan.Sivekumar@cnscccsn.gc.ca>  
**Subject:** POL.4. Fuel reprocessing, recycling, and waste OIF - Work plan contributions

Hi Vlad/ Said / Gavin,

Please send to me your work plan contributions. I have attached herewith samples from DSS and IGAD. Dylan from DART will be the primary integrator of the final report and the literature survey.

Please send to me your contribution by August 12<sup>th</sup> latest as I would like to get the draft to you all by end of that week.

Julian

'''

POL.4 work package details: (from our last team meeting)

- Preliminary literature review on reprocessing technologies / processes summary complete ( draft writeup attached herewith).
  - Three major subprocesses identified
    - 1. Spent fuel handling/staging;
    - 2. Extraction of fissionable material and waste separation;
    - 3. Two paths identified 3a) Fissionable material handling/fuel manufacturing and 3b) Waste handling and disposal.
- Work plan in development key steps (in individual members area of expertise) identified include
  - Literature review, (Applicable legislation, regulations, regdocs, IAEA standards, CSA standards, NSG guidelines etc etc) – Look at Regulatory framework, OPEX/Training of staff/expertise and any Licensing issues).
  - Analysis (Identify any gaps, elucidate path forward, make conclusions and recommendations
  - and Document/record results of analysis/documentation. Team has agreed that this will be an internal report.

Action to team members:

- Please provide a brief write up scope of work under your purview, and some brief timelines in terms of completing above work packages. Please send this by email to me by July 12<sup>th</sup>, 2024.
- Julian to provide a template for the workplan. Please see attached herewith the workplan template. Member inputs will be integrated and the draft workplan will be sent for team members to review before approval.

''''

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

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## Hautfenne-Jewer, Celia

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**Subject:** POL.3 / POL.4 update: Team meeting  
**Location:** Microsoft Teams Meeting

**Start:** Mon 2023-11-20 2:00 PM  
**End:** Mon 2023-11-20 3:00 PM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Organizer:** Amalraj, Julian  
**Required Attendees:** Amalraj, Julian; Janzen, Emily; Posada, Lester; Miller, Douglass; Khotylev, Vladimir; Kanasewich, Elaine; Cochrane, Chris; Brunarski, Lee  
**Optional Attendees:** McAllister, Andrew; Henley, Tessa

Hello, everybody,

Setting this meeting up to provide /get an update on where things are.

Current status of these two Objectives are that they are on HOLD. Primarily due to the need to align with NRCAN and other stakeholder priorities as well recent resource constraints.

POL.3 is expected to be on hold and POL.4 may be started in Q1 of next year.

Status so far:

POL.3:\_

- Literature review on Enrichment technologies in progress (nearing completion with project was put on hold) some writeup completed.
- Questionnaire for targeted stakeholders in works related to enriched fuel supply and supply chain . Data may be available with DART already. May want to send this to specific applicants/stakeholders. NRCAN suggest nothing public.
- Workplan and review /approval by SMRLC to be done. Awaiting restart.
- Project status reported as delayed with less than 25% completed.

POL.4:

- Not yet initiated. Awaiting go ahead from Management and resource allocation.
- To develop a draft OIF for review/approval .

There is a stakeholders (NGO) meeting on Nov 17 that Elaine and Andrew are planning to attend. This meeting is to get an update and review next steps.

---

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## Hautfenne-Jewer, Celia

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**From:** Amalraj, Julian  
**Sent:** February 28, 2024 10:04 AM  
**To:** McAllister, Andrew; Sigouin, Luc; Bourassa, Pascale; Kanasewich, Elaine; Boudrias, Geneviève; Dagher, Elias; Campbell, Kimberley; Broeders, Mark; Tabikh, Tarek; Moroz, David  
**Cc:** Reinholz, David; Kent, Michael; Henley, Tessa; Steedman, Gavin; Miller, Douglass; Khotylev, Vladimir; Janzen, Emily; Brunarski, Lee; Posada, Lester; Cochrane, Chris  
**Subject:** FW: Reprocessing Working Group - CNSC internal coordination  
**Attachments:** #7227769-Reprocessing\_Working\_Group\_Kick-Off\_Meeting\_-\_CNSC\_Summary\_(February\_23\_\_2024).DOCX.DRF; #6769354-POL\_4\_\_Fuel\_reprocessing\_\_recycling\_\_and\_waste\_OIF.DOCX.DRF  
**Importance:** High

Hello there,

Please see attached the meeting summary from the kick off meeting for NRCAN led Working Group on Reprocessing. As you are aware, under the SMR Readiness Initiative, the CNSC has one of its OIF (POL.4 – Reprocessing) with a mandate to support this work including regulatory readiness. Based on the kick off for this working group, we plan to shortly initiate this POL.4 OIF with a updated scope and timeline aligning with the priorities as discussed in this working group.

We still have a few questions in scoping the OIF, internal deliverables and monitoring/reporting. I will reach out individually on this and as well discuss/revalidate resource commitments.

Currently we continue to keep POL.3 – Enrichment on hold but depending on the scope of POL.4, we expect to restart POL.3 as well in the near future based on resource commitments.

I have attached the POL.4 draft OIF for your consideration in case you need more details.

Julian

p.s. Thank you Tessa for a detailed summary.

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
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**Pages 3818 to / à 3824  
are withheld pursuant to section  
sont retenues en vertu de l'article**

**21(1)(a)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

**POL.3. Objective Initiation Form (OIF)**

**Objective ID:** POL.3.

**Objective:** *Policy for Canadian Enrichment (in partnership with others)*

**Team:**

- *Julian Amalraj, Senior Project Officer, DNCFR (Objective Lead)*
- *Lester Posada, Project Officer, DNCFR*
- *Emily Janzen, Project Officer, DART*
- *Douglass Miller, Lead Technical Advisor, DART*
- *Elaine Kanasewich, Senior Advisor, Nuclear Non-Proliferation, DSS*
- *Vladimir Khotylev, Technical Specialist, DAA*
- *Lee Brunarski, Senior Policy Officer, SPD*

**Target Completion Date:** *June 30, 2025*

**Expected Deliverables:**

*The purpose of this objective is to ensure that the CNSC is prepared to regulate the production and use of enriched fuel in Canada. The following shall be considered in scope:*

1. *Review CNSC's current regulatory requirements and guidance concerning the enrichment of nuclear fuels and the management of its products and byproducts as well as the use of associated technologies in compliance with Canada's international commitments.*
2. *Review CNSC's current requirements and guidance on the manufacturing of enriched nuclear fuels for use in emerging technologies, such as Small Modular Reactors (SMR). Determine if optimization is required.*
3. *Review CNSC staff's current capabilities in conducting reviews of licenses seeking authorization for the production and/or use of enriched nuclear fuel; and determine if additional operating experience, training, and guidance on technical assessments is required.*
4. *Based on the results of Deliverables #1, 2 & 3, develop a report which identifies all items which require future development and provide recommendations. Leverage existing CNSC processes, as required, to perform the analysis and report on the required information. This deliverable will be considered complete when the report is submitted.*
5. *When or if solicited by policy owners, and in collaboration with Federal partners, support policy development by providing technical advice on the enrichment of nuclear fuels in Canada.*

**Reporting Requirements:**

- *Provide bi-weekly status updates to the appropriate DSPOC on the objective's progress.*
- *At the completion of Deliverable #1, 2 & 3, present to the SMR Leadership Committee the proposed path forward for Deliverable #4.*

**Project Interfaces:**

- POL.4. Fuel reprocessing, recycling, and waste (ex. WATTs) (in partnership with other Federal partners)
- POL.6. Establish and Foster Domestic Partnerships
- REP.13 Undertake a strategic review of the CNSC's Regulatory Framework of regulations and REGDOCs
- CAC.27. General training plan for staff

Ensure the leads of these objectives are kept informed of the outcomes of this objective.

**Approval:**

Please see original signed OIF & PCF



E-DOCS-#6769335-v  
7-POL.3 - Policy for C









E-DOCS-#7341021  
Bulk PCF - SMR Repri

Name	Position	Signature and Date
<u>Julian Amalraj</u>	Objective Lead	<p style="text-align: center;"><b>X</b></p> <hr/> <p>Julian Amalraj Senior Project Officer</p>
<u>Andrew McAllister</u>	Objective Lead Director	<p style="text-align: center;"><b>X</b></p> <hr/> <p>Andrew McAllister Director, NPF</p>
<u>Tiffany MacLellan</u>	SMR Readiness Project Manager	<p style="text-align: center;"><b>X</b></p> <hr/> <p>Tiffany MacLellan Senior Project Officer, ARLD</p>
<u>Sarah Eaton</u>	SMR Readiness Hub Director	<p style="text-align: center;"><b>X</b></p> <hr/> <p>Sarah Eaton Director, ARLD</p>

DART SMR Readiness Project Plan

*Note: Refer to Section 7 of the DART Project Plan for changes to the OIF form.*

**Project Change Form (PCF)**

<b>Initiator:</b> <u>T. Tabikh</u>		<b>Request ID:</b> <u>2024-ALL-01</u>												
<b>Type of Change:</b> <input checked="" type="checkbox"/> Scope → <input type="checkbox"/> Addition <input type="checkbox"/> Deletion <input checked="" type="checkbox"/> Change <input checked="" type="checkbox"/> Schedule → <input type="checkbox"/> Addition <input type="checkbox"/> Deletion <input checked="" type="checkbox"/> Change <input checked="" type="checkbox"/> Project → <input checked="" type="checkbox"/> Other														
<b>Objective ID:</b> Many Objective I.D.s, please refer to eDoc#7340148.														
<b>Objective:</b> <p style="text-align: center;">Many Objectives please refer to eDoc#7340148.</p>														
<b>Schedule:</b> <p style="text-align: center;">Many Objective timelines impacted, please refer to eDoc#7340148.</p>														
<b>Proposed Change:</b> <p>As part of the SMR Readiness reprioritization review, the team consulted with all impacted directorates to confirm scope and schedule priority. This resulted in the schedule change of several objectives, removal of a few objectives, and the proposal for addition of a couple objectives. The summary of the proposed changes is captured in eDoc#7340148. This PCF is</p>														
<b>Impact to Project or Objective:</b> <p>The impact of the changes is confirmed to be acceptable based on the consultation and discussions with directorates. Resource impacts is manageable as timelines were normally extended provided less resource pressure to directorates. Two additional objectives are proposed which represent minor increase in FTE usage; this was flagged to impacted</p>														
<b>PMO Review:</b> PMO recommends SMRLC endorsement.														
<b>Approvals:</b> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 33%;">Name</th> <th style="width: 33%;">Position</th> <th style="width: 33%;">Signature and Date</th> </tr> </thead> <tbody> <tr> <td>Tarek Tabikh</td> <td>Objective Lead</td> <td style="text-align: center;">             Tabikh, Tarek           <div style="font-size: 8px; margin-top: 5px;">             Digitally signed by Tabikh, Tarek              DN: c=CA, o=GC, ou=CNSC-CCSN, cn=""              Tabikh, Tarek              Reason: I am the author of this document              Location:              Date: 2024.09.06 09:33:02-0400              Foxit PDF Editor Version: 13.0.1           </div> </td> </tr> <tr> <td>Beth Vary/Mark Broeders (SMRLC Chairs)</td> <td>Objective Lead Director</td> <td></td> </tr> <tr> <td>Tarek Tabikh</td> <td>SMR Readiness Project Manager</td> <td style="text-align: center;">             Tabikh, Tarek           <div style="font-size: 8px; margin-top: 5px;">             Digitally signed by Tabikh, Tarek              DN: c=CA, o=GC, ou=CNSCCSN,              CN=""              Tabikh, Tarek              Reason: I am the aut hor of t hi document              Location:              Date: 2024.09.06 09:36:11-0400              Foxit PDF Editor Version: 13.0.1           </div> </td> </tr> </tbody> </table>			Name	Position	Signature and Date	Tarek Tabikh	Objective Lead	 Tabikh, Tarek <div style="font-size: 8px; margin-top: 5px;">             Digitally signed by Tabikh, Tarek              DN: c=CA, o=GC, ou=CNSC-CCSN, cn=""              Tabikh, Tarek              Reason: I am the author of this document              Location:              Date: 2024.09.06 09:33:02-0400              Foxit PDF Editor Version: 13.0.1           </div>	Beth Vary/Mark Broeders (SMRLC Chairs)	Objective Lead Director		Tarek Tabikh	SMR Readiness Project Manager	 Tabikh, Tarek <div style="font-size: 8px; margin-top: 5px;">             Digitally signed by Tabikh, Tarek              DN: c=CA, o=GC, ou=CNSCCSN,              CN=""              Tabikh, Tarek              Reason: I am the aut hor of t hi document              Location:              Date: 2024.09.06 09:36:11-0400              Foxit PDF Editor Version: 13.0.1           </div>
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<b>SMRLC:</b>														

**Date Taken to SMRLC:** August 28, 2024

**Decision:**  Approved       Rejected       Bring Back

**Change Implemented:** SMRLC endorsed the summary of changes with 100% agreement (results in eDoc#7358874). This includes escalation of artificial intelligence related work to

## Hautfenne-Jewer, Celia

---

**From:** Steedman, Gavin  
**Sent:** August 8, 2024 2:39 PM  
**To:** Amalraj, Julian  
**Subject:** Re: POL.4. Fuel reprocessing, recycling, and waste OIF - Work plan contributions

Hello Julian,

Please see the workplan I have developed from my contribution to POL.4 for waste management.

1. Literature review,
  - Understanding the input/output streams of various reprocessing technologies
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  - Review the characteristics of radioactive waste produced by reprocessing
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  - Discussion about how the CNSC regulatory framework could be applied to the various waste streams produced by reprocessing facility.
  - Focus on the novel challenges posed by reprocessing waste and how/if this waste can fit within the constraints of Canada's nuclear waste strategy
3. Document/record results of analysis/documentation.
  - Document results from literature review and analysis
  - Share findings and results with colleagues

Thanks,

Gavin

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**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Wednesday, August 7, 2024 11:39 AM  
**To:** Hamlat, Said <Said.Hamlat@cnscccsn.gc.ca>; Khotylev, Vladimir <Vladimir.Khotylev@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Sivekumar, Dylan <Dylan.Sivekumar@cnscccsn.gc.ca>  
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Julian

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Action to team members:

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- Julian to provide a template for the workplan. Please see attached herewith the workplan template. Member inputs will be integrated and the draft workplan will be sent for team members to review before approval.

''''

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** Henley, Tessa  
**Sent:** July 15, 2024 3:22 PM  
**To:** Amalraj, Julian  
**Cc:** Gratton, Wayne  
**Subject:** RE: POL. 4 team meeting highlight (June 18, 2024)

Hi Julian,

Here's a brief description of work I can contribute to POL.4 (and that has been approved by my team lead):

- **Phase 1: Literature review:** conduct and compile research (to be supplemented by SMEs) on:
  - applicable legislation and associated policies
  - comparative cases abroad vs. key parameters for the Canadian proposal (Moltex)
  - available technology and key considerations, particularly around optics and consent-based process
  - regulatory considerations
  - environmental considerations (current standard of care)
  - staffing and resource considerations
- **Phase 2: Analysis:**
  - Perform gap analysis for reprocessing legislative and policy coverage, outreach and consent-based processes
- **Phase 3: Final Report:**
  - Support collation of final report

For the first two phases of this work, I think I can safely allocate 6-8 hours a week on average, and I can do 2-3 hours a week to support collation of the final support.

Best,  
Tessa

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Sent:** Wednesday, June 19, 2024 1:48 PM  
**To:** Henley, Tessa <[tessa.henley@cnscccsn.gc.ca](mailto:tessa.henley@cnscccsn.gc.ca)>; Posada, Lester <[lester.posada@cnscccsn.gc.ca](mailto:lester.posada@cnscccsn.gc.ca)>; Cochrane, Chris <[chris.cochrane@cnscccsn.gc.ca](mailto:chris.cochrane@cnscccsn.gc.ca)>; Khotylev, Vladimir <[Vladimir.Khotylev@cnscccsn.gc.ca](mailto:Vladimir.Khotylev@cnscccsn.gc.ca)>; Sivekumar, Dylan <[Dylan.Sivekumar@cnscccsn.gc.ca](mailto:Dylan.Sivekumar@cnscccsn.gc.ca)>; Hamlat, Said <[Said.Hamlat@cnscccsn.gc.ca](mailto:Said.Hamlat@cnscccsn.gc.ca)>; Steedman, Gavin <[gavin.steedman@cnscccsn.gc.ca](mailto:gavin.steedman@cnscccsn.gc.ca)>; Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Miller, Douglass <[Douglass.Miller@cnscccsn.gc.ca](mailto:Douglass.Miller@cnscccsn.gc.ca)>  
**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>  
**Subject:** POL. 4 team meeting highlight (June 18, 2024)  
**Importance:** High

Hello POL.4 team members,

Please see attached highlights from our team meeting and key requests to tea members.

I provided an update on the status of the two Objectives POL. 3 & POL.4. This meeting primarily is related to POL.4 but the two objectives have some dependencies in terms of resources and stakeholder priorities.

Status so far:

POL.3: Objective is on HOLD at present. Expected to be restarted in August once resource commitments are confirmed.

- NRCAN / GAC have indicated that they are priority is changing from reprocessing to enrichment going forward. More clarity on how this change will be implemented in the next two weeks.
- SMR hub has requested a Project Change form to formally request change to schedule. In progress.
- 
- Project work on Literature review related to Enrichment technologies was in progress when the project was put on hold) some writeup completed.
- Information / Questionnaire related to enriched fuel supply and supply chain in progress. Data may be available with DART already. May want to send this to specific applicants/stakeholders.
- Project status reported as delayed (on HOLD) with less than 25% completed.

POL.4: Objective was kick started in Mid- May. Initial scoping and workplan discussion have happened. Team member contributions to work plan in progress.

- Change in priority yet to be fully scoped/planned. For now team working on developing a work plan.

POL.4 work package details:

- Preliminary literature review on reprocessing technologies / processes summary complete ( draft writeup attached herewith).
  - Three major subprocesses identified
    - 1. Spent fuel handling/staging;
    - 2. Extraction of fissionable material and waste separation;
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Action to team members:

- Please provide a brief write up scope of work under your purview, and some brief timelines in terms of completing above work packages. Please send this by email to me by July 12<sup>th</sup>, 2024.
- Julian to provide a template for the workplan. Please see attached herewith the workplan template. Member inputs will be integrated and the draft workplan will be sent for team members to review before approval.

Any questions, please do not hesitate to reach out to me. I will be available by email (from Vienna next week).

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** Cochrane, Chris  
**Sent:** July 31, 2024 1:27 PM  
**To:** Amalraj, Julian  
**Subject:** RE: POL.4 Work plan contributions

Hey Julian,

Sorry for the delay. I had a lot of difficulty thinking about how to present this, so let me know if you need more or different details. I've got a document going with some preliminary resources and additional thoughts, so I might already have what you need.

### **Phase 1 - Literature review:**

Conduct and compile research (supplemented by relevant divisional SMEs as needed) on:

1. Safeguards concerns and approaches at reprocessing facilities (incl. spent fuel handling, fissile material extraction, and waste stream),
2. Nuclear security requirements for reprocessing facilities (incl. impact of new NSRs),
3. Import/export regulations for reprocessing facility components/technology (domestic and multilateral),

This will include assessment of approaches to regulation in countries with or pursuing reprocessing facilities (e.g. France, Japan, South Korea).

### **Phase 2 – Analysis:**

4. Impact of deployment on DSS human resources needs (e.g., required training, staffing level).
5. Potential knock-on impacts of deployment on areas under CNSC mandate (e.g. IAEA safeguards implementation in Canada),

### **Phase 3 – Reporting:**

6. Compile results from Phases 1 and 2, and
7. Support review and revision of final report.

I will be on leave the month of September, but have received offers of support from colleagues so this work can probably continue in my absence if the timeline requires.

Thanks,  
Chris

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Wednesday, July 31, 2024 11:30 AM  
**To:** Cochrane, Chris <chris.cochrane@cnscccsn.gc.ca>  
**Subject:** POL.4 Work plan contributions

Hi Chris,

Following up to see if you have something for me. I am just starting the Work plan draft and would really appreciate your contributions.


Julian


*Julian Amalraj M.Sc, P.Eng, PMP*

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## Hautfenne-Jewer, Celia

---

**From:** Hamlat, Said  
**Sent:** August 7, 2024 2:23 PM  
**To:** Amalraj, Julian  
**Cc:** Lam, Jeffrey  
**Subject:** RE: POL.4. Fuel reprocessing, recycling, and waste OIF - Work plan contributions  
**Attachments:** WorkPlan\_Pol4.docx

Hi Julian,

Thank you for the reminder and attached is the work plan drafted by Jeffrey and Said.

We remain available for any further questions,

Thank you,  
Said

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Wednesday, August 7, 2024 11:39 AM  
**To:** Hamlat, Said <Said.Hamlat@cnscccsn.gc.ca>; Khotylev, Vladimir <Vladimir.Khotylev@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Sivekumar, Dylan <Dylan.Sivekumar@cnscccsn.gc.ca>  
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## Project: SMR Readiness

**Objective (ID POL.4):** Fuel reprocessing, recycling, and waste

**Collaborating Team:** HSECD and ERAD

**Note:** RP aspects are recommended to be added/captured in the analysis phase.

### Work Plan

#### Phase 1: Literature Review

Literature review (Applicable legislation, regulations, regdocs, IAEA standards, CSA standards, NSG guidelines etc etc) – Look at Regulatory framework, OPEX/Training of staff/expertise and any Licensing issues).

##### 1.1- Regulatory Framework

- Legislation: NSCA,
- Regulations: GNSCR, UMMR, RP
- Regdocs: EP, WM, RP
- CSA: N288 (EP) and N292 (WM) Series
- IAEA: safety series and TECDOCx WM and fuel cycle),

Timeline: Nov. 2024

##### 1.2-OPEX/Training

- Review experiences in Environmental management related to pre-licensing, licensing and post licensing associated to nuclear fuel cycle.
- Review staff capacity in environmental control safety areas.
- Identify gaps/(needs applicable to reprocessing aspects

Timeline: Dec. 2024

##### 1.3-Licensing: Review and adapt

- Env. Monitoring
- Eff and Em. Monitoring
- Environmental Risk Assessment
- Release Limits
- Public Dose

Timeline: Dec. 2024

#### Phase 2: Analysis

**2.1-Analysis:** Identify any gaps, elucidate path forward, make conclusions and recommendations)

**2.2-Reporting:** Document/record results of analysis/documentation.

Timeline: Feb. 2025

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** October 16, 2024 9:13 AM  
**To:** Posada, Lester; Steedman, Gavin; Sivekumar, Dylan; Brunarski, Lee; Cochrane, Chris; Hamlat, Said; Khotylev, Vladimir  
**Subject:** Attached Files - POL. 4 Reprocessing Kick start  
**Attachments:** #7241672-Memo\_-\_Background\_on\_Reprocessing\_Technologies.DOCX.DRF; #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.DOCX.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7270992-POL\_4\_reprocessing\_team\_meeting\_.MSG.DRF; #7382667-Enrichment\_and\_Reprocessing\_Working\_Groups\_Timeline\_Updates.MSG.DRF; #7382690-RE\_POL\_4\_team\_meeting\_highlight\_(June\_18\_2024).MSG.DRF; #7382695-Re\_POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF\_-\_Work\_plan\_contributions\_.MSG.DRF

Hello POL. 4 team,

Please see attached review material for today's meeting. As earlier indicated, this will be our kickstart for this project. I expect to get the work plan completed before end of October and have the project run its normal course.

Planning to have weekly meetings. Please come prepared to answer a few questions for me.

- Expected timeframes :
  - o Literature review (Oct-Jan, 2025)
  - o Analysis (Feb, 2025)
  - o Reporting/Review/Consultations (Mar-May, 2025)
  - o Project complete by Jun, 2025.
- Time / support from your Directorate/Divisions to complete the project on time.
- Alternates if you have identified any.
- Dedicated time every week to meet and discuss progress.
- How do we consult/engage other government agencies in our work.

Julian

## Hautfenne-Jewer, Celia

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[UNPROTECTED]


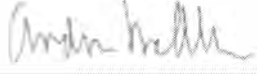
# SMR Readiness Objective Workplan

## POL.3: ENRICHMENT

<<SHAREPOINT LINK>>

## DOCUMENT APPROVAL

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NAME AND TITLE	ROLE	SIGNATURE
Julian Amalraj	Objective Lead	
Andrew McAllister	Objective Lead Director	

## DOCUMENT HISTORY

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The following table shows the revision history for this document:

REVISION #	REASON FOR REVISION	APPROVAL SIGNATURE	DATE
001	Initial release		

## TABLE OF CONTENTS

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<b>1.0</b>	<b>Scope.....</b>	<b>3</b>
1.1	Overall Scope.....	3
1.2	Assumptions.....	3
1.3	Exclusions.....	3
<b>2.0</b>	<b>Deliverables and milestones.....</b>	<b>4</b>
2.1	Deliverables.....	4
2.2	Milestones.....	4
2.3	Risk.....	5
2.4	Communication / Meetings.....	5
<b>3.0</b>	<b>Objective Team.....</b>	<b>6</b>

## 1.0 SCOPE

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### 1.1 Overall Scope

The purpose of this objective is to ensure CNSC readiness to regulate enrichment should it arise. The following shall be considered in scope:

1. Develop a high-level workplan that includes project milestones/timelines.
2. Support policy analysis and/or development on fuel enrichment in Canada, in collaboration with federal partners.
3. Review CNSC's current requirements and guidance on fuel enrichment. Ensure alignment with #2.
4. Review CNSC staff's current capabilities in conducting reviews of licenses seeking authorization related to fuel enrichment, and for the production and/or use of enriched nuclear fuel; and determine if improvements to regulatory framework, operating experience, training, and guidance on technical assessments is required.
5. Develop and publish an internal report which documents the analysis (based on #3 & #4), identifies all items which require further development and provides recommendations. Leverage existing CNSC processes, as required, to perform the analysis and issue the required information.
6. Ensure CNSC readiness to regulate fuel reprocessing by initiating Implementation of the identified recommendations into existing CNSC managed process. This is considered complete when the recommendations are entered into a managed process.

### 1.2 Assumptions

- While the objective will scan all available reprocessing approaches and technologies, the analysis will focus on the most likely proposals/applications for reprocessing in the Canadian context.
- Risks related to prioritization of resources to ensure alignment with #2 above will be dealt with outside of this project.
- Project team members represent Directorates and will be able to pull in additional resources / expertise as needed to ensure support for project. Any prioritization/ additional resource request will be dealt with through the SMR hub.
- Final report will be an internal report.

### 1.3 Exclusions

None.

## 2.0 DELIVERABLES AND MILESTONES

### 2.1 Deliverables

1. Internal memos and/or reports documenting results of the literature review that lists:
  - Key steps involved with reprocessing technologies considered, associated approaches and applications.
  - Applicable Canadian legislations, associated regulations and prevailing policies/processes including standards and requirements and any upcoming changes.
  - International commitments, prevailing policies/processes, regulations in other countries pursuing reprocessing, import/export restrictions (domestic and multilateral) and related challenges.
  
2. Internal memos and/or reports documenting results of analysis that lists:
  - Legislative, regulatory, policy readiness and any associated gaps/improvements.
  - OPEX and gaps related to OPEX dealing with pre-licensing, licensing and compliance verification processes.
  - Impact of deployment on staff capacity and training needs.
  - Potential impact of deployment related to safeguards/non-proliferation in Canada and any associated changes needed.
  - Impact of deployment to consent based processes and outreach.
  
3. Publish an internal report which documents the results of objectives, identifying all items which require further development and provide recommendations.

### 2.2 Milestones

Milestone or Deliverable	Responsible	Completion Target	Actual Completion
Reprioritized project Kickoff / Restart	J. Amalraj / SMR Hub	October, 2024	16 October 2024
Work Plan developed	POL-4 team	October, 2024	October, 2024
Present Work Plan to SMR Leadership Committee for endorsement	NPFD / SMRLC	November, 2024	
25% Complete			
Complete Deliverable#1	POL-4 team	February, 2025	
50% Complete			
Complete Deliverable#2	POL-4 team	March, 2025	
75% Complete			

Milestone or Deliverable	Responsible	Completion Target	Actual Completion
Complete Deliverable#3	POL-4 team	May, 2025	
Close out Objective	J. Amalraj / SMR Hub	June, 2025	
100% Complete			

## 2.3 Risk

Identified project risks include:

- Risk to schedule / milestones from delay in execution of deliverables due to lack of available resources / reprioritization. This will be communicated to SMRLC and updated through submission of a project change form.
- Risk to schedule / milestones from delay in publishing of the final report due to changes in external information and/or new information related to assumptions. This will be communicated to SMRLC and updated through submission of a project change form.

## 2.4 Communication / Meetings

Project stakeholders include CNSC (through SMRLC), other government agencies (identified by NRCAN as part of its working group) and Industry.

- Project team will meet bi-weekly to discuss progress and co-ordinate execution of the project.
- Bi-weekly status updates are provided internally with monthly updates to SMRLC.
- Team members have representation in the NRCAN led working group on reprocessing which include other government agencies for coordination and consultation. Project team will coordinate deliverables and consultations with other government agencies through IGAD.
- No consultations are planned with the industry and currently CNSC has been advised by NRCAN to keep deliverables related to the project for internal purposes only.

### 3.0 OBJECTIVE TEAM

---

Identify the team makeup, their positions, and their responsibilities (latter being optional).

1. Julian Amalraj, Senior Project Officer, DNCFR (Objective Lead)
2. Lester Posada, Project Officer, DNCFR
3. Gavin Steedman, Project Officer, DNCFR
4. Dylan Sivekumar, Project Officer, DART
5. Tessa Henley, Project Officer, DART
5. Lee Brunarski, Senior Policy Officer, SPD
6. Chris Cochrane, Technical Advisor, DSS
7. Said Hamlat, Environmental Risk Specialist, DERPA
8. Vladimir Khotylev, Technical Specialist, RPTD, DAA
9. Ruxandra Dranga, Technical Specialist, RPTD (backup), DAA

Canada's Nuclear  
Regulator



# CNSC SMR Readiness Project: Policy 4 - Fuel Reprocessing, Recycling, and Waste



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

**Table of contents**

**Commented [LP1]:** Add/Remove headings as needed for writeups

**Executive summary ..... 1**

**1 Introduction ..... 2**

**2 Methodology..... 2**

**3 Fuel Reprocessing ..... 3**

**4 Regulatory Approach in Canada..... 4**

4.1 The Nuclear Safety and Control Act ..... 4

4.2 Regulations ..... 4

4.3 Licences ..... 4

4.4 Regulatory Documents ..... 4

4.5 CSA Documents ..... 4

**5 Findings and Analysis ..... 4**

5.1 Legislative, Regulatory and Policy Readiness ..... 4

5.2 Licensing and Compliance Verification ..... 5

5.3 Safeguards and Non-Proliferation ..... 5

5.4 Waste Management ..... 5

5.5 Consultation and Engagement ..... 5

5.6 Internal CNSC Capacity and Training ..... 5

**6 Conclusions and Recommendations ..... 5**

**References ..... 6**

**Acronyms and abbreviations..... 7**

**Glossary ..... 10**

**A. Literature Review Summary ..... 11**

**B. Reprocessing Technologies..... 12**

B.1 Water and organic solvents: PUREX ..... 12

B.2 Electrometallurgy: Pyroprocessing ..... 12

B.3 Electrometallurgy: Oxide Electrowinning..... 13

B.4 Dry Process: Fluoride Volatility ..... 14

## **Executive summary**

*Insert text here*



## 1 Introduction

Through the application of the *Nuclear Safety and Control Act* (NSCA) [1], and its associated regulations, the Canadian Nuclear Safety Commission (CNSC) regulates the use of nuclear energy and materials to protect health, safety, security and the environment; to implement Canada's international commitments on the peaceful use of nuclear energy; and to disseminate objective scientific, technical and regulatory information to the public.

This report has been compiled to support the CNSC's Small Modular Reactor (SMR) Readiness Project under Objective ID Policy 4 – Fuel Reprocessing, Recycling and Waste [x]. The purpose of this report is to review and evaluate the CNSC's current capabilities in conducting reviews of applicants seeking authorization related to fuel reprocessing, and for the production and/or use of reprocessed nuclear fuel. This report provides an analysis on the existing regulatory framework and current practices and processes associated with licensing and compliance verification. This report also identifies recommendations for improvements associated with providing staff training, guidance on technical assessments, and gaining operating experience for potential fuel reprocessing applicants.

Commented [LP2]: This should be reworded better.

## 2 Methodology

*Insert text here*

*Methodology – review of the current regulatory framework (Act, Regulations, Regulatory Documents, CSA Standards), open literature sources, discussions with technical experts, OPEX gleaned from countries that currently reprocess fuel (US, France, Japan)*

- **Purpose:**

*The methodology section explains the "how" and "why" of your research, demonstrating the validity and rigor of your study.*

- **Key Elements:**

- **Research Design:** Describe the type of research (e.g., experimental, observational, qualitative, quantitative) and why you chose it.
- **Data Collection:** Explain how you gathered data (e.g., surveys, interviews, experiments) and the instruments used (e.g., questionnaires, specific equipment).
- **Data Analysis:** Describe the methods used to analyze the data (e.g., statistical tests, qualitative analysis techniques).
- **Ethical Considerations:** Address any ethical issues or approvals obtained for the study.

- **Sample Selection:** Explain how you selected your participants or subjects, including the sample size and criteria.

- **Example:**

- "This study employed a mixed-methods approach, combining quantitative surveys with qualitative interviews to explore..."
- "Data was collected through a structured questionnaire administered to a sample of 100 participants, selected randomly from..."
- "Statistical analysis was performed using t-tests and ANOVA to compare the results..."

- **Why it's important:**

A well-written methodology section allows readers to:

- Assess the validity and reliability of your research
- Understand how your research was conducted.
- Reproduce your study or build upon it.

- **Tips for writing:**

- Be clear and concise.
- Use appropriate terminology.
- Justify your choices.
- Organize the information logically.

### 3 Fuel Reprocessing

The nuclear fuel cycle begins with uranium being extracted from the ground and ends with its disposal following its use in the generation of electricity. The “front end” of the nuclear fuel cycle includes nuclear facilities involved in mining, refining, conversion, enrichment, and fuel fabrication. After the nuclear fuel has been used in a reactor, it becomes spent fuel and may undergo further steps in the “back end” of the nuclear fuel cycle which includes temporary storage, reprocessing, and recycling before eventual disposal as waste. If the spent fuel is not reprocessed, the fuel cycle is referred to as an “open” or “once-through” fuel cycle; if spent fuel is reprocessed, and partly reused, it is referred to as a ‘closed’ nuclear fuel cycle.

As a commercial nuclear reactor operates, the fissile uranium in the fuel is partially consumed by fission and absorption reactions. The fission reactions create energy, more neutrons to continue the fission chain reactions and fission products, while the absorption reactions generate transuranic (TRU) elements, primarily isotopes of plutonium, neptunium, americium, and curium. Fission products also absorb neutrons. The enrichment level of the uranium fuel compensates for neutron losses and absorption, and the enrichment decreases as uranium-235 is consumed. Ultimately, the decrease in enrichment and

accumulation of fission products and TRU reach a point at which the fission reactions cannot be sustained for the enrichment level, and the reactor has to be refueled. At this point, the used fuel is said to be “spent” and must be replaced. However, the accumulated fission products and TRU isotopes continue to emit very high levels of radiation and heat and pose difficulties in management and disposal.

Reprocessing is the term given to the separation and recovery of the spent nuclear fuel (SNF) that has remaining potential energy and value. This is accomplished in heavily-shielded, remotely operated and maintained facilities. Historically, the uranium and plutonium are recycled to reactors (such as in Mixed Oxide (MOX) fuel) while the other constituents, primarily fission products and some transuranics, are treated as waste, usually by vitrification. This serves to reduce the volume of material to be disposed of as high-level waste. The recovered uranium and plutonium have relatively low radiation fields and can usually be contact-handled (i.e., unshielded gloveboxes) for fuel fabrication or storage.

## **4 Regulatory Approach in Canada**

*Insert text here*

### **4.1 The Nuclear Safety and Control Act**

*Insert text here*

### **4.2 Regulations**

*Insert text here*

### **4.3 Licences**

*Insert text here*

### **4.4 Regulatory Documents**

*Insert text here*

### **4.5 CSA Documents**

*Insert text here*

## **5 Findings and Analysis**

Insert Findings and Analysis

### **5.1 Legislative, Regulatory and Policy Readiness**

*Insert text here*

## **5.2 Licensing and Compliance Verification**

*Insert text here*

The CNSC performs regulatory oversight of licensed facilities to verify compliance with the requirements of the NSCA and associated regulations made under the NSCA, each site’s licence and licence conditions, and any other applicable standards and regulatory documents.

CNSC staff use the safety and control area (SCA) framework to assess, evaluate, review, verify and report on licensee performance. The SCA framework includes 14 SCAs, each subdivided into specific areas that define its key components. For further information on the [SCA framework](#) can be found on the CNSC’s website.

## **5.3 Safeguards and Non-Proliferation**

*Insert text here*

## **5.4 Waste Management**

*Insert text here*

## **5.5 Consultation and Engagement**

*Insert text here*

As an agent of the Crown and as Canada’s nuclear regulator, the CNSC recognizes and understands the importance of consulting and building relationships with Indigenous peoples in Canada. CNSC staff are committed to building long-term relationships with Indigenous groups who have interest in CNSC-regulated facilities within their traditional and/or treaty territories. By pursuing informative and collaborative ongoing interactions, the CNSC’s goal is to build relationships and trust. The CNSC’s Indigenous engagement practices – which include information sharing and funding support (through the CNSC’s Participant Funding Program (PFP)) to assist Indigenous peoples in meaningfully participating in Commission proceedings and ongoing regulatory activities – are consistent with the principles of upholding the honour of the Crown and reconciliation.

## **5.6 Internal CNSC Capacity and Training**

*Insert text here*

## **6 Conclusions and Recommendations**

*Insert text here*

## References

Commented [LP3]: Update

- [1] *Nuclear Safety and Control Act*, S.C. 1997, c. 9.
- [2] CSA Group, CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*, 2012.
- [3] *Radiation Protection Regulations* (2000), SOR/2000-203.
- [4] *General Nuclear Safety and Control Regulations* (2000), SOR/2000-202.
- [5] *Canada Labour Code*, R.S.C., 1985, c. L-2.
- [6] CNSC, *REGDOC-3.1.2: Reporting Requirements for Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*, Ottawa, Canada, 2018.
- [7] CNSC, *REGDOC-3.2.1. Public Information and Disclosure*, Ottawa, Canada, 2018.
- [8] CNSC, *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2018*, CNSC staff presentation on the subject report to the Commission, Ottawa, Canada, 2019.
- [9] CNSC, *REGDOC-3.6, Glossary of CNSC Terminology*, Ottawa, Canada, 2019.
- [10] CSA Group, CSA N288.1-14, *Guidelines for Calculating Derived Release Limits for Radioactive Materials in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities*, 2019.
- [11] Ministry of the Environment, Conservation and Parks, *Ontario's Ambient Air Quality Criteria*, 2019.
- [12] Health Canada, *Guidelines for Canadian Drinking Water Quality*, 2017.
- [13] Canadian Council of Ministers of the Environment, *Canadian Water Quality Guidelines for the Protection of Aquatic Life*, 1999.
- [14] Canadian Council of Ministers of the Environment, *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health*, 1999.
- [15] CSA Group, CSA N288.7, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, 2015.

**Acronyms and abbreviations**

Commented [LP4]: Update

<b>AANTC</b>	Algonquin Anishinabeg Nation Tribal Council
<b>ALARA</b>	as low as reasonably achievable, taking into account social and economic factors
<b>AFN</b>	Alderville First Nation
<b>AOO</b>	Algonquins of Ontario
<b>APFN</b>	Algonquins of Pikwàkanagàn First Nation
<b>BE</b>	below expectations
<b>Bq</b>	becquerel
<b>BRR</b>	Blind River Refinery
<b>BTL</b>	Best Theratronics Ltd.
<b>BWXT</b>	BWXT Nuclear Energy Canada Inc.
<b>CAD</b>	Canadian dollar
<b>Cameco</b>	Cameco Corporation
<b>CANDU</b>	Canada Deuterium Uranium
<b>CBFN</b>	Chippewas of Beausoleil First Nation
<b>CCME</b>	Canadian Council of Ministers of the Environment
<b>CFM</b>	Cameco Fuel Manufacturing Inc.
<b>CGIFN</b>	Chippewas of Georgina Island First Nation
<b>CLFN</b>	Curve Lake First Nation
<b>cm</b>	centimetre
<b>CMD</b>	Commission member document
<b>CNL</b>	Canadian Nuclear Laboratories
<b>CNSC</b>	Canadian Nuclear Safety Commission
<b>Co-60</b>	cobalt-60
<b>CRFN</b>	Chippewas of Rama First Nation
<b>CSA</b>	Canadian Standards Association (now CSA Group)
<b>DRL</b>	derived release limit
<b>EMS</b>	environmental management system
<b>ERA</b>	environmental risk assessment
<b>ERT</b>	Emergency Response Team
<b>ESDC</b>	Employment and Social Development Canada
<b>FFOL</b>	fuel facility operating licence
<b>FS</b>	fully satisfactory
<b>g</b>	gram

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<b>GBq</b>	gigabecquerel
<b>GCDWQ</b>	Guidelines for Canadian Drinking Water Quality
<b>GEH-C</b>	GE Hitachi Nuclear Energy Canada Inc.
<b>GTLS</b>	gaseous tritium light source
<b>h</b>	hour
<b>HF</b>	hydrogen fluoride
<b>HFN</b>	Hiawatha First Nation
<b>HT</b>	tritium gas
<b>HTO</b>	hydrogenated tritium oxide or tritiated water
<b>HNO<sub>3</sub></b>	nitric acid
<b>IAEA</b>	International Atomic Energy Agency
<b>IEMP</b>	Independent Environmental Monitoring Program
<b>kg</b>	kilogram
<b>km</b>	kilometre
<b>L</b>	litre
<b>LCH</b>	licence conditions handbook
<b>LTI</b>	lost-time injury
<b>m<sup>3</sup></b>	cubic metres
<b>MBq</b>	megabecquerel
<b>MeV</b>	megaelectronvolt
<b>mg</b>	milligram
<b>mg/L</b>	milligram per litre
<b>MBQ</b>	Mohawks of the Bay of Quinte
<b>MCFN</b>	Mississaugas of the Credit First Nation
<b>MFN</b>	Mississauga First Nation
<b>MECP</b>	Ontario Ministry of the Environment, Conservation and Parks
<b>MNO</b>	Métis Nation of Ontario
<b>MSIFN</b>	Mississaugas of Scugog Island First Nation
<b>mSv</b>	millisievert
<b>N</b>	nitrogen
<b>NEW</b>	nuclear energy worker
<b>NO<sub>x</sub></b>	nitrogen oxides
<b>NO<sub>2</sub></b>	nitrogen dioxide
<b>Nordion</b>	Nordion (Canada) Inc.

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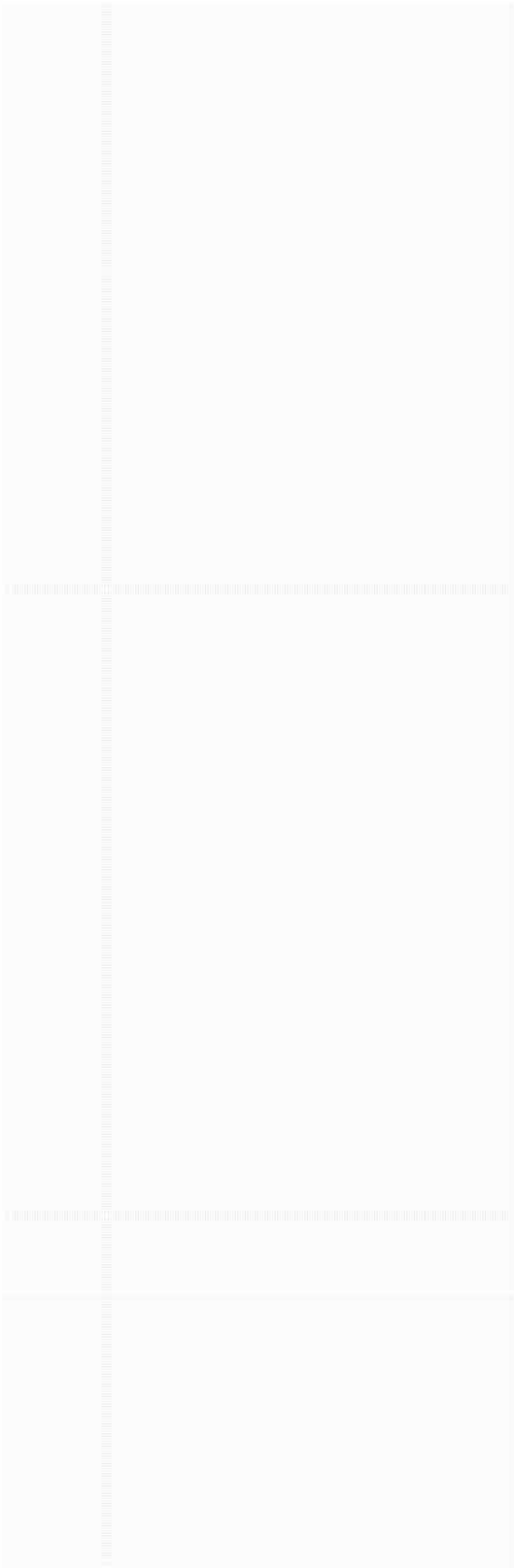
<b>NSCA</b>	<i>Nuclear Safety and Control Act</i>
<b>NSPFOL</b>	nuclear substance processing facility operating licence
<b>OPG</b>	Ontario Power Generation
<b>PF</b>	Participant Funding Program
<b>PHCF</b>	Port Hope Conversion Facility
<b>PPE</b>	personal protective equipment
<b>ppm</b>	parts per million
<b>ROR</b>	regulatory oversight report
<b>RP</b>	radiation protection
<b>SA</b>	satisfactory
<b>SAN</b>	Sagamok Anishnawbek Nation
<b>SCA</b>	safety and control area
<b>SRBT</b>	SRB Technologies (Canada) Inc.
<b>SRFN</b>	Serpent River First Nation
<b>T<sub>2</sub></b>	tritiated gas
<b>TBq</b>	terabecquerel
<b>TFN</b>	Thessalon First Nation
<b>UA</b>	unacceptable
<b>µg</b>	microgram
<b>µSv</b>	microsievert
<b>UF<sub>6</sub></b>	uranium hexafluoride
<b>UO<sub>2</sub></b>	uranium dioxide
<b>UO<sub>3</sub></b>	uranium trioxide
<b>VIM</b>	Vision in Motion
<b>WSC</b>	workplace safety committee
<b>WTFN</b>	Williams Treaties First Nations

## Glossary

For definitions of terms used in this document, see REGDOC-3.6, *Glossary of CNSC Terminology* [9], which includes terms and definitions used in the *Nuclear Safety and Control Act* [1] and the regulations made under it, and in CNSC regulatory documents and other publications. REGDOC-3.6 is provided for reference and information.

## **A. Literature Review Summary**

*Insert text here*



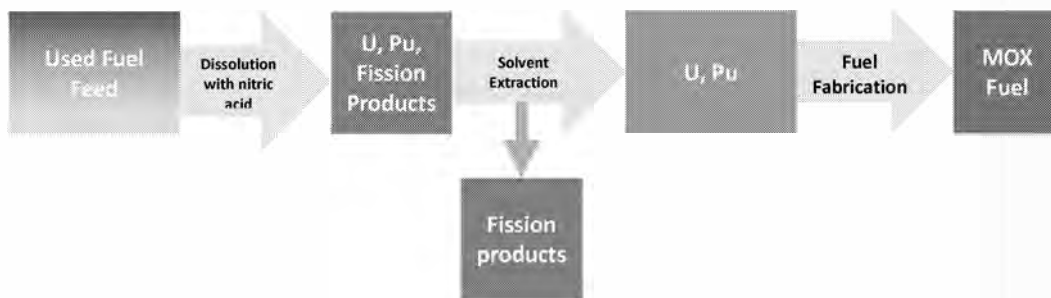
## B. Reprocessing Technologies

This section provides an overview of various reprocessing technologies. This information is summarized from open literature sources.

### B.1 WATER AND ORGANIC SOLVENTS: PUREX

All commercial reprocessing plants worldwide, currently use the hydrometallurgical PUREX (plutonium uranium extraction) process, which separates uranium and plutonium [2]. Figure 1 provides a visual of the PUREX process. This involves dissolving the fuel elements in concentrated nitric acid. Chemical separation of uranium and plutonium is then undertaken by solvent extraction steps using an organic solvent. The Pu and U can be returned to the input side of the fuel cycle – the uranium to the conversion plant prior to re-enrichment and the plutonium straight to MOX fuel fabrication. The remaining material can then be solidified and packaged as waste, either through vitrification or cementation depending on its level of radioactivity. Variations on the PUREX process exist by utilizing different solvents or extracting agents or adding additional chemicals to selectively extract the desired materials.

Figure 1 Simplified Purex Process [3]



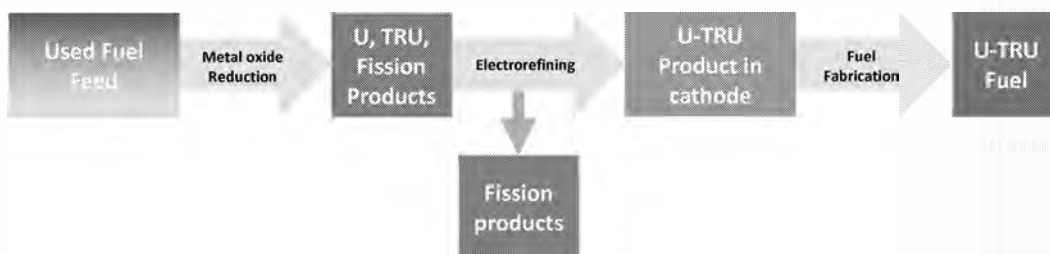
### B.2 ELECTROMETALLURGY: PYROPROCESSING

Electrometallurgical processing techniques ('pyroprocessing') utilize high-temperature processes to separate nuclides from the radioactive waste stream. These processes have been under development in the US Department of Energy laboratories, notably Argonne, as well as by the Korea Atomic Energy Research Institute (KAERI) [4]. Figure 2 provides a visual of the pyroprocessing process. It involves a smaller plant than hydrometallurgical/aqueous processes, so are well suited to closing the fuel cycle at reactor sites, with the need to store only a small volume of actual fission products

as waste. Integral fast reactor and molten salt reactor (MSR) fuel cycles are based on on-site pyroprocessing. Separating all actinides together for recycle gives a very radioactive fuel which is thus self-protecting.

Pyroprocessing involves several stages. First, any oxide fuels need to be reduced to metal. The metal now as anode can then be electro-refined in molten LiCl salt to deposit uranium and actinides (including Pu) together onto a liquid cadmium cathode, leaving fission products behind. Two types of cathode may be used together, for uranium deposition, and for a U-TRU product. A cathode processor then cleans up the cathode materials (removing salt and cadmium) at about 1200°C ready for fuel fabrication for a fast reactor. Fission products are recovered from the salt by ion exchange in zeolite columns and encapsulated into a durable vitreous wasteform.

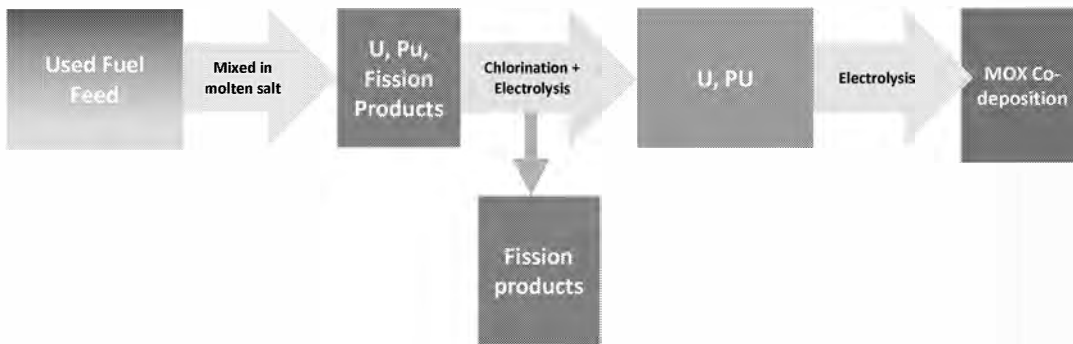
**Figure 2 Simplified Pyroprocessing Process**



### B.3 ELECTROMETALLURGY: OXIDE ELECTROWINNING

Oxide electrowinning process is an experimental process derived from a modified pyroprocessing process developed by Research Institute of Atomic Reactor (RIAR) in Russia [5]. Research into this process has been under development by the Japan Nuclear Cycle Development Institute [6]. Figure 3 provides a visual of the oxide electrowinning process. Spent nuclear fuel is placed in a molten salt solution and is simultaneously electro-chemically dissolved and recovered by electrolysis. Next, the residual spent fuel is dissolved into the salt by chlorine gas and further separated by electrolysis. Afterwards, the molten salt is electrolyzed to recover U and Pu as a MOX co-deposit.

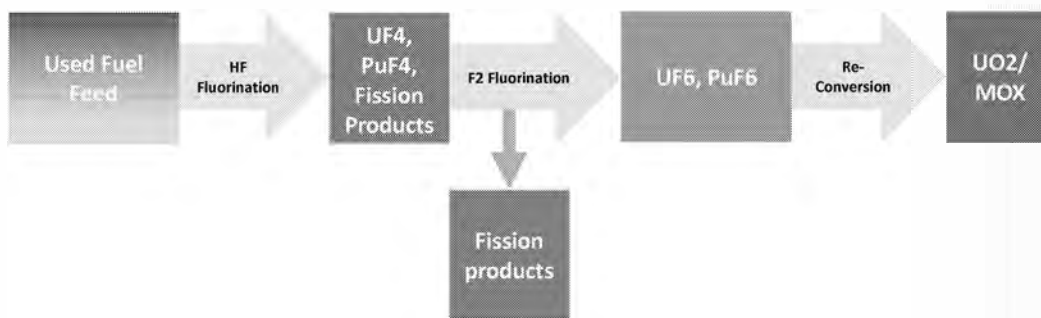
**Figure 3 Simplified Oxide Electrowinning Process**



#### B.4 DRY PROCESS: FLUORIDE VOLATILITY

Fluoride volatility process is a dry method for reprocessing spent nuclear fuel [7]. Research into this process has been under development by the Japan Nuclear Cycle Development Institute. Figure 4 provides a visual of the fluoride volatility process. Spent nuclear fuel is reacted with hydrogen fluoride gas to create uranium tetrafluoride (UF<sub>4</sub>) and plutonium tetrafluoride (PuF<sub>4</sub>). Next, the UF<sub>4</sub> and PuF<sub>4</sub> are further fluorinated with fluorine gas to create (UF<sub>6</sub>) and (PuF<sub>6</sub>). The UF<sub>6</sub> and PuF<sub>6</sub> can now be re-converted back into its oxide form (UO<sub>2</sub>/PuO<sub>2</sub>) and fabricated into fuel.

**Figure 4 Simplified Fluoride Volatility Process**



## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** June 19, 2024 1:48 PM  
**To:** Henley, Tessa; Posada, Lester; Cochrane, Chris; Khotylev, Vladimir; Sivekumar, Dylan; Hamlat, Said; Steedman, Gavin; Kent, Michael; Miller, Douglass  
**Cc:** McAllister, Andrew  
**Subject:** POL. 4 team meeting highlight (June 18, 2024)  
**Attachments:** For review: Reprocessing Working Group Meeting Takeaways; #6769354-POL\_4\_\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.docx.DRF; Reprocessing Working Group Kick-Off - Elaborated criteria.pptx; #7241672-Memo\_-\_Background\_on\_Reprocessing\_Technologies.DOCX.DRF; #7012784-Objective\_Workplan\_Template\_\_SMR\_Readiness.doc.DRF

**Importance:** High

Hello POL.4 team members,

Please see attached highlights from our team meeting and key requests to team members.

I provided an update on the status of the two Objectives POL. 3 & POL.4. This meeting primarily is related to POL.4 but the two objectives have some dependencies in terms of resources and stakeholder priorities.

Status so far:

POL.3: Objective is on HOLD at present. Expected to be restarted in August once resource commitments are confirmed.

- NRCAN / GAC have indicated that their priority is changing from reprocessing to enrichment going forward. More clarity on how this change will be implemented in the next two weeks.
- SMR hub has requested a Project Change form to formally request change to schedule. In progress.
- 
- Project work on Literature review related to Enrichment technologies was in progress when the project was put on hold) some writeup completed.
- Information / Questionnaire related to enriched fuel supply and supply chain in progress. Data may be available with DART already. May want to send this to specific applicants/stakeholders.
- Project status reported as delayed (on HOLD) with less than 25% completed.

POL.4: Objective was kick started in Mid- May. Initial scoping and workplan discussion have happened. Team member contributions to work plan in progress.

- Change in priority yet to be fully scoped/planned. For now team working on developing a work plan.

POL.4 work package details:

- Preliminary literature review on reprocessing technologies / processes summary complete ( draft writeup attached herewith).
  - o Three major subprocesses identified
    - 1. Spent fuel handling/staging;
    - 2. Extraction of fissionable material and waste separation;
    - 3. Two paths identified 3a) Fissionable material handling/fuel manufacturing and 3b) Waste handling and disposal.

- Work plan in development key steps (in individual members area of expertise) identified include
  - o Literature review, (Applicable legislation, regulations, regdocs, IAEA standards, CSA standards, NSG guidelines etc etc) – Look at Regulatory framework, OPEX/Training of staff/expertise and any Licensing issues).
  - o Analysis (Identify any gaps, elucidate path forward, make conclusions and recommendations
  - o and Document/record results of analysis/documentation. Team has agreed that this will be an internal report.

Action to team members:

- Please provide a brief write up scope of work under your purview, and some brief timelines in terms of completing above work packages. Please send this by email to me by July 12<sup>th</sup>, 2024.
  
- Julian to provide a template for the workplan. Please see attached herewith the workplan template. Member inputs will be integrated and the draft workplan will be sent for team members to review before approval.

Any questions, please do not hesitate to reach out to me. I will be available by email (from Vienna next week).

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** Henley, Tessa  
**Sent:** June 14, 2024 11:21 AM  
**To:** Amalraj, Julian; Reinholz, David  
**Subject:** For review: Reprocessing Working Group Meeting Takeaways

Hi Julian and David,

Please find below key takeaways from today's reprocessing working group meeting – please let me know if you think there's anything missing/a better way to characterize any of the key highlights before we share with management and relevant CNSC staff.

Thanks,  
Tessa

\*\*\*

### Reprocessing Meeting – NRCAN Updates

Attendees: NRCAN, CNSC, Global Affairs, ISED, ECCC, HC, PrairiesCan

Key Takeaways:

- NRCAN emphasized how conversations on resource prioritization between reprocessing and enrichment are happening quickly, with acknowledgement of departments'/agencies' limited bandwidth.
  - While it's uncertain how resources will be allocated, NRCAN's objective is to be able to provide effective policy advice/recommendations should it be requested in the coming months.
- As heard during the Project Yellow meetings, NRCAN reiterated that the reprocessing working group may pivot towards enrichment, with reprocessing moving to the back burner.
- NRCAN and GAC mentioned that they are having ongoing discussions on the potential need to modernize nuclear non-proliferation policy in Canada to prepare for the deployment of reprocessing technology.
- Next steps:
  - Greater clarity on the pivot to enrichment will be established in the next week or two.
  - NRCAN will be setting up a subsequent meeting in the coming weeks.
  - Participants asked to reflect on resource capacity and whether work on reprocessing and enrichment can be done concurrently if timelines were to be slowed down.

[UNPROTECTED]



SMR Readiness Objective Workplan  
**XXX.##: OBJECTIVE TITLE**

E-Doc XXXXXXXX

**DOCUMENT APPROVAL**

---

NAME AND TITLE	ROLE	SIGNATURE
Name	Objective Lead	
Name	Objective Lead Director	

**DOCUMENT HISTORY**

---

The following table shows the revision history for this document:

REVISION #	REASON FOR REVISION	APPROVAL SIGNATURE	DATE
000	Initial release		

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## TABLE OF CONTENTS

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<b>1.0</b>	<b>Scope</b> .....	<b>3</b>
1.1	Assumptions.....	3
1.2	Exclusions.....	3
<b>2.0</b>	<b>Deliverables and milestones</b> .....	<b>4</b>
2.1	Deliverables.....	4
2.2	Milestones.....	4
2.3	Schedule (optional).....	5
<b>3.0</b>	<b>Objective Team</b> .....	<b>6</b>
	<b>APPENDIX A: Meeting Agenda</b> .....	<b>7</b>

## **1.0 SCOPE**

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### **1.1 Overall Scope**

Document the scope of the objective. This can be taken from the high-level OIF scope, or drilled down as identified by the team.

### **1.2 Assumptions**

Document any assumptions being made as part of the workplan development.

### **1.3 Exclusions**

Document and justify any areas that were purposefully left out of scope.

## 2.0 DELIVERABLES AND MILESTONES

### 2.1 Deliverables

Document the objective’s deliverables and intended steps planned to meet each deliverable. This should provide a roadmap for how the objective team will accomplish the deliverables and objectives scope.

### 2.2 Milestones

Identify important milestones throughout the project’s lifecycle. This should include the workplan’s presentation to the SMR Leadership Committee, and implementation strategy’s presentation to SMRSC. These milestones can also be used to determine percent complete of the objective; this provides a mechanism for the leads to track whether or not their objective is on track. A sample milestone table is provided below

Milestone or Deliverable	Responsible	Completion Target	Actual Completion
Project Plan developed			
Present Project Plan to SMR Leadership Committee for endorsement			
Complete Deliverable#1			
25% Complete			
...			
50% Complete			
Prepare implementation strategy			
Present implementation strategy to SMRSC for endorsement			
Execution implementation strategy			
75% Complete			
Complete report			
Close-out Project			

### 2.3 Schedule (optional)

Provide a snapshot of the objective's schedule or reference to the document that contains it (i.e. Visio). This is optional as it can be captured in the milestones table above.

However, if the team would benefit from a more detailed schedule (i.e. including the steps between milestones), then this section can be used/

### **3.0 OBJECTIVE TEAM**

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Identify the team makeup, their positions, and their responsibilities (latter being optional).

## APPENDIX A: READ ME

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### **For information only. To be deleted when developing the workplan.**

The purpose of this workplans is to maintain consistency between the objectives in the SMR Readiness project. This template identifies the minimum necessary information to document at the start of the project such that the team and rest of the organization have a common understanding of what will be accomplished as part of the objective and its associated timelines.

The initial workplan should be sent to the PMO for record keeping and to update the tracker with the milestones; this will be used as the baseline. Changes throughout the project is expected, and Leads can track it on the workplan and formally revise it as seen fit.

Additional workplan sections that have been helpful to other Objective Leads include:

- Risk: documenting objective risks and how to mitigate
- Change Management: how changes in the objectives will be handled by the team
- Stakeholders and Communication: who are the objective's stakeholders, and how will the team manage their expectation; including thoughts on how to interact with the interfacing objectives
- Team Meeting Agenda and Frequency: logistics of team meetings

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** November 13, 2024 2:40 PM  
**To:** Munezero, Gretta  
**Cc:** McAllister, Andrew; Henley, Tessa; Posada, Lester; Tran, Nhan  
**Subject:** POL.4: Objective\_Workplan  
**Attachments:** #7385982-POL\_4\_Objective\_Workplan\_.doc.DRF

Hi Gretta,

Could you please add this Andrew task for review and comments/approval. This document is the final version that incorporates all comments from the team members of POL.4.

Looking to have this approved before the Nov 27<sup>th</sup> SMRLC.

Julian

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** October 22, 2024 11:21 AM  
**To:** Posada, Lester; Sivekumar, Dylan; Henley, Tessa; Brunarski, Lee; Khotylev, Vladimir; Steedman, Gavin; Hamlat, Said; Cochrane, Chris  
**Cc:** McAllister, Andrew  
**Subject:** POL.4: Objective\_Workplan for your review  
**Attachments:** #7385982-POL\_4\_\_Objective\_Workplan\_.doc.DRF

Hello POL. 4 team members,

Please see attached the draft work plan for your review. I have kept it basic and have combined all contribution to generic levels. Please provide your comments. We will review / discuss these in our meeting tomorrow.

Julian

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** November 14, 2024 9:11 AM  
**To:** Cochrane, Chris; Hamlat, Said; Khotylev, Vladimir; Dranga, Ruxandra; Sivekumar, Dylan; Posada, Lester; Henley, Tessa; Brunarski, Lee; Steedman, Gavin  
**Cc:** Tran, Nhan; McAllister, Andrew  
**Subject:** POL.4 Workplan & SMRLC Deck - November 27, 2024  
**Attachments:** #7405871-POL\_4\_Workplan\_SMRLC\_Deck\_-\_November\_27\_\_2024.PPTX.DRF; #7385982-POL\_4\_\_Objective\_Workplan\_.doc.DRF

Hello POL. 4 team members,

Please see attached the draft workplan (finalized by team) and a copy of the presentation for the SMRLC to seek endorsement. If you have any additional comments, please send it to me by November 19, 2024.

We are on the agenda for November 27<sup>th</sup> SMRLC.

Julian

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** April 30, 2024 10:23 AM  
**To:** McAllister, Andrew  
**Subject:** POL.4. Fuel reprocessing, recycling, and waste OIF  
**Attachments:** #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.docx.DRF

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hi Andrew,

Please see attached POL. 4 initiation form for your review. This has been reviewed and comments incorporated by all the team members and Tarek as well. I have tried to be as specific as possible here while ensuring there is alignment with the NRCAN led working group.

Please let me know what your comments are. Hoping to finalize this by this week.

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** May 1, 2024 9:36 AM  
**To:** McAllister, Andrew  
**Subject:** POL.4. Fuel reprocessing, recycling, and waste OIF  
**Attachments:** #6769354-POL\_4\_Fuel\_reprocessing\_recycling\_and\_waste\_OIF.DOCX.DRF

Hi Andrew,

This is for your final review / signatures. I have incorporated all comments and this document is ready for signatures.

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

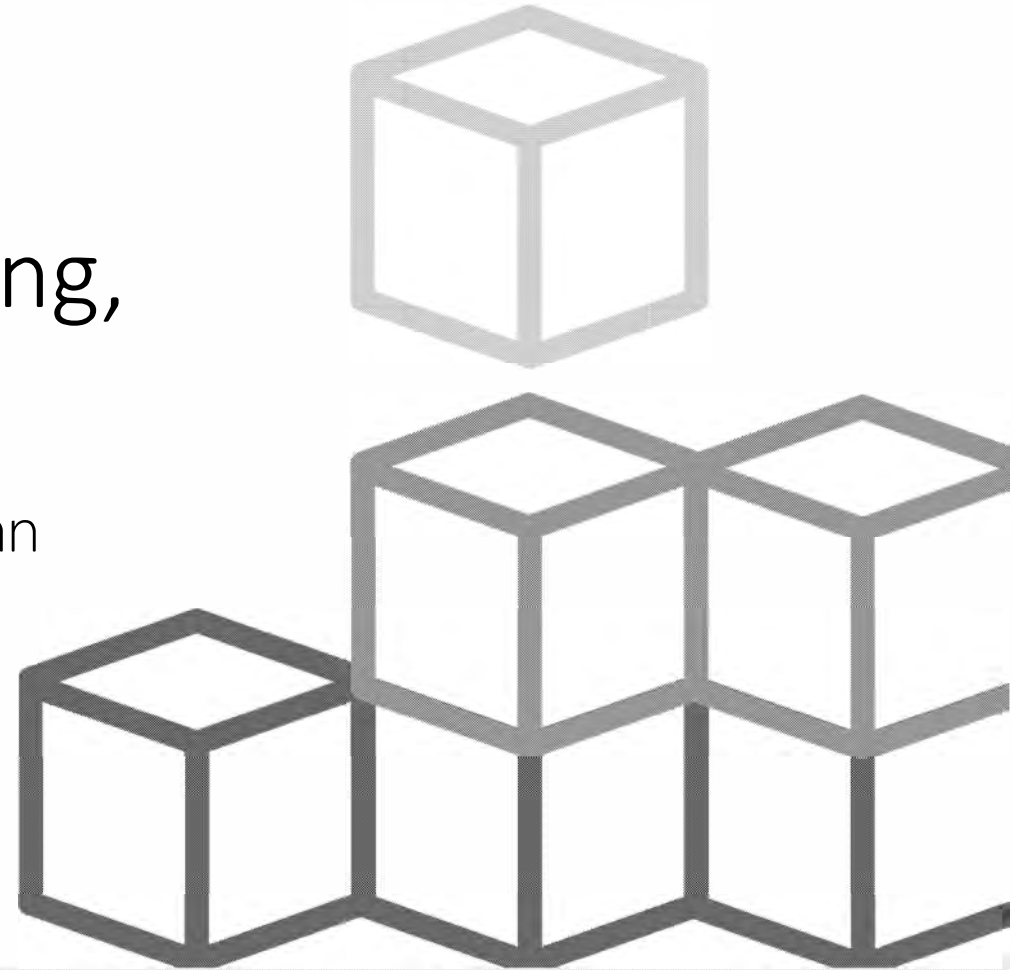
 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

# POL.4: Fuel reprocessing, recycling, and waste

SMR Leadership Committee Workplan  
Endorsement

Prepared by: Tessa Henley / Julian Amalraj

e-Doc 7405871



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

# Purpose

- To provide CNSC management with an overview of the POL.4 workplan including scope, detailed deliverables, assumptions, exclusions, milestones, and overall schedule.
- Provide an avenue for management to provide feedback on the POL.4's workplan.
- **Ultimately, to seek endorsement of the workplan.**

# POL.4 Scope

1. Develop a high-level workplan that includes project milestones/timelines.
2. Support policy analysis and/or development on fuel reprocessing in Canada, in collaboration with federal partners. {See notes below}
3. Review CNSC's current requirements and guidance on reprocessing of spent nuclear fuel. Ensure alignment with #2.
4. Review CNSC staff's current capabilities in conducting reviews of licenses seeking authorization related to reprocessing of spent fuel, and for the production and/or use of reprocessed nuclear fuel; and determine if improvements to regulatory framework, operating experience, training, and guidance on technical assessments is required.
5. Develop and publish an internal report which documents the analysis (based on #3 & #4), identifies all items which require further development and provides recommendations. Leverage existing CNSC processes, as required, to perform the analysis and issue the required information.
6. Ensure CNSC readiness to regulate fuel reprocessing by initiating Implementation of the identified recommendations into existing CNSC managed process. This is considered complete when the recommendations are entered into a managed process.

# POL.4 Deliverables

## Deliverable 1.

### **Internal memos and/or reports documenting results of the literature review, including:**

- Key process steps involved with reprocessing technologies and applications considered.
- Applicable Canadian legislations, associated regulations and prevailing policies/processes including standards and requirements and any upcoming changes.
- International commitments, prevailing policies/processes, regulations in other countries pursuing reprocessing, import/ export restrictions (domestic and multilateral) and related challenges.

## Deliverable 2.

### **Internal memos and/or reports documenting results of analysis, including:**

- Legislative, regulatory, policy readiness and any associated gaps/ improvements.
- OPEX and gaps related to OPEX dealing with pre-licensing, licensing and compliance verification processes.
- Impact of deployment on staff capacity and training needs.
- Potential impact of deployment related to safeguards/non-proliferation in Canada and any associated changes needed.
- Impact of deployment to consent based processes and outreach.

## Deliverable 3.

### **An internal report which documents the results of objectives, identifying all items which require further development and provide recommendations.**

- Content of the report will be shared with other government agencies to facilitate policy analysis
- Approach towards sharing of results / recommendations developed in consultation with NRCAN

# Assumptions & Exclusions

- While the objective will scan all available reprocessing approaches and technologies, the analysis will focus on the most likely proposals/applications for reprocessing in the Canadian context.
- Risks related to prioritization of resources to ensure alignment with #2 from the scope (support policy analysis and/or development on fuel reprocessing in Canada, in collaboration with federal partners) will be dealt with outside of this project.
- Project team members represent Directorates and will be able to pull in additional resources/expertise as needed to ensure support for project. Any prioritization/additional resource request will be dealt with through the SMR hub.
- Final report will be an internal report.
- No exclusions to note.

# Objective Schedule

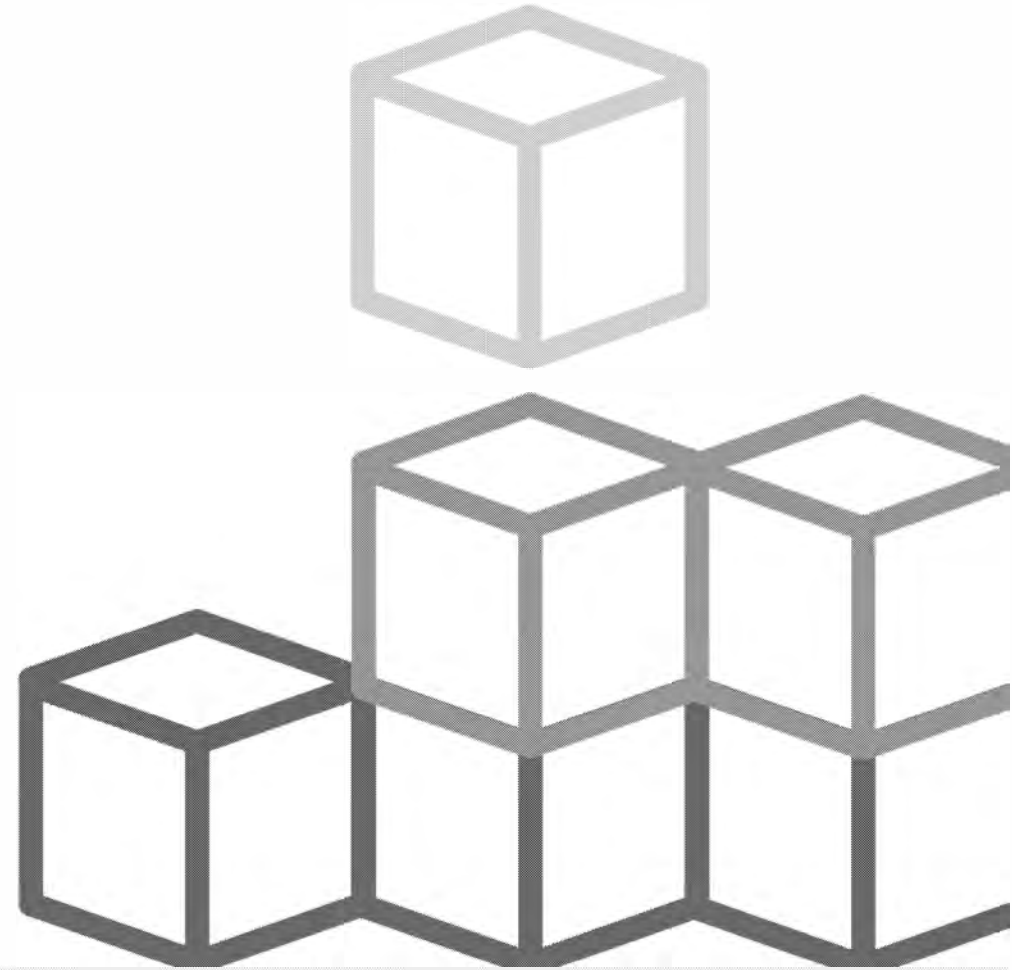
Milestone or Deliverable	Responsible	Completion Target
Reprioritized project Kickoff / Restart	J. Amalraj / SMR Hub	October 2024
Work Plan developed	POL.4 team	October 2024
Present Work Plan to SMR Leadership Committee for endorsement	NPFD / SMRLC	November 2024
Complete Deliverable#1	POL.4 team	February 2025
50% Complete		
Complete Deliverable#2	POL.4 team	March 2025
75% Complete		
Complete Deliverable#3	POL.4 team	May 2025
Close out Objective	J. Amalraj / SMR Hub	June 2025
100% Complete		



# Objective Team's Request

**SMR Leadership Committee voting members are requested to endorse the workplan.**

# Questions?



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** September 23, 2024 2:22 PM  
**To:** McAllister, Andrew; Munezero, Gretta  
**Subject:** RE: APPROVED | MEMORANDUM - Service Agreement in support of Moltex \_WATSS Project

Hi Andrew,

Stephane signs off after Ramzi with the CFO attestation memo and the "docket".

Legal should have signed off before Ramzi. They have already looked at it. Maybe Legal looks at it before the president. I am not sure how this goes or what happened there. I will follow up with Gretta.

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** Monday, September 23, 2024 2:19 PM  
**To:** Munezero, Gretta <gretta.munezero@cnscccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** RE: APPROVED | MEMORANDUM - Service Agreement in support of Moltex \_WATSS Project

Hi there,

I am confused. I thought that the package was put on hold with EVPO while we got Legal's sign off.

In addition, I am not seeing Ramzi's signature on the CFO attestation or memo to the President. It would also need to go to Stephane Cyr's office.

Can the two of you chat and let me know what the next steps are?

Thanks

Andrew

---

**From:** Gosselin, Danika <[danika.gosselin@cnscccsn.gc.ca](mailto:danika.gosselin@cnscccsn.gc.ca)>  
**Sent:** Monday, September 23, 2024 2:12 PM  
**To:** Munezero, Gretta <[gretta.munezero@cnscccsn.gc.ca](mailto:gretta.munezero@cnscccsn.gc.ca)>  
**Cc:** Asongtia, Alestile <[alestile.asongtia@cnscccsn.gc.ca](mailto:alestile.asongtia@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN)

<ROBEVPOSupport@cnscccsn.gc.ca>

**Subject:** APPROVED | MEMORANDUM - Service Agreement in support of Moltex \_WATSS Project

Hi Gretta,

Service Agreement has been reviewed and Approved by EVP – Ramzi Jammal. Routing Slip has been signed.

Please confirm if this is ready to go to PO.

Thank you!



---

**From:** Munezero, Gretta <gretta.munezero@cnscccsn.gc.ca>

**Sent:** Monday, September 16, 2024 12:35 PM

**To:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <ROBEVPOSupport@cnscccsn.gc.ca>

**Cc:** Asongtia, Alestile <alestile.asongtia@cnscccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>

**Subject:** MEMORANDUM - Service Agreement in support of Moltex \_WATSS Project

Hello,

Please see attached package for the MEMORANDUM - Service Agreement in support of Moltex \_WATSS Project, for VP and EVP signature .

In the package is included :

- 7353796 : Service Agreement in support of Moltex \_WATSS Project for **EVP signature**
- 7359114 : Special Project Service Agreement CFO Attestation for **VP and EVP signature**
- 7257298 : Service Agreement between the CNSC and Moltex Energy Canada Inc. for **President's signature**
- 7361668 : Routing slip for **SME, Director, DG, VP, EVP, Chief of staff and President signature**

Thank you.

***Gretta Munezero***

Administrative Assistant, Nuclear Processing Facilities Division  
Canadian Nuclear Safety Commission | Government of Canada  
Adjoint administratif, Division des installations de traitement Nucléaires  
Commission canadienne de sûreté nucléaire | Gouvernement du Canada

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** May 2, 2024 4:51 PM  
**To:** Nguyen, Thuy  
**Cc:** Moroz, David  
**Subject:** RE: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

Hi there,

I've already submitted the gathered comments to RFSC

I believe Richard Tennant provided a couple of EMPD comments in what i submitted. Please check with him and let me know.

Cheers

Andrew

Sent from my Bell Samsung device over Canada's largest network.

----- Original message -----

From: "Nguyen, Thuy" <Thuy.Nguyen@cnsccsn.gc.ca>  
Date: 2024-05-02 4:25 p.m. (GMT-05:00)  
To: "McAllister, Andrew" <Andrew.McAllister@cnsccsn.gc.ca>  
Cc: "Moroz, David" <david.moroz@cnsccsn.gc.ca>  
Subject: FW: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

Andrew,

I hope you are well. Just a heads up, EMPD have some comments that I will submit tomorrow. I noted that comments are due on the 29<sup>th</sup> April but the CNSC has till the 13<sup>th</sup> May to submit to the IAEA. Sincere apologies on our lateness, but I hope it's ok with you. Please let me know otherwise.

Thanks,

Thuy

**Thuy Nguyen**

Acting Director  
Emergency Management Program division

Canadian Nuclear Safety Commission

[Thuy.Nguyen@cnscccsn.gc.ca](mailto:Thuy.Nguyen@cnscccsn.gc.ca)

1-343-998-9687

---

**From:** Persaud, Amar <[amar.persaud@cnscccsn.gc.ca](mailto:amar.persaud@cnscccsn.gc.ca)> **On Behalf Of** Regulatory Framework Steering Committee / Comité directeur du Cadre de réglementation (CNSC /CCSN)  
**Sent:** Friday, April 5, 2024 11:09 AM  
**To:** CNSC.F RFSC Members / Membres CDCR F.CCSN <[cnscc.f.rfscmembers-membrescdcr.f.ccsn@cnscccsn.gc.ca](mailto:cnscc.f.rfscmembers-membrescdcr.f.ccsn@cnscccsn.gc.ca)>  
**Cc:** Carrière, Danielle <[Danielle.Carriere@cnscccsn.gc.ca](mailto:Danielle.Carriere@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Regulatory Framework Steering Committee / Comité directeur du Cadre de réglementation (CNSC /CCSN) <[rfsc-cdcr@cnscccsn.gc.ca](mailto:rfsc-cdcr@cnscccsn.gc.ca)>; RPD Support Group / Groupe de soutien de la DPR (CNSC/CCSN) <[rpdsg-gsdpr@cnscccsn.gc.ca](mailto:rpdsg-gsdpr@cnscccsn.gc.ca)>  
**Subject:** For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

Good day,

This is to advise Regulatory Framework Steering Committee (RFSC) members that the IAEA has recently posted the following draft for NUSSC Committee-level review:

**DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11**

Due to IAEA: 13 May 2024

Proposed Internal deadline: 29 April 2024

Lead review division: NPF (Andrew McAllister)

There were no comments from Canada in Step 8

**Attached Documents (3x)**

- DS518A Safety of Nuclear Fuel Reprocessing Facilities Stepp 11 (E-doc: 7254278)
- DS518A Comment Table (E-doc: 7254375)
- DS518A Safety of Nuclear Fuel Reprocessing Facilities Stepp 11 Track Changes (E-doc: 7254292)

RFSC DGs are requested to determine if their directorate will take part in the review of the draft standard.

Please submit comments to technical lead, Andrew McAllister, by April 29, 2024. (The IAEA deadline is May 13, 2024)

Thank you for your attention to this matter.

Regulatory Framework Steering Committee (RFSC) /  
Comité directeur du Cadre de réglementation (CDCR)

Email: [rfsc-cdcr@cnscccsn.gc.ca](mailto:rfsc-cdcr@cnscccsn.gc.ca)

**Hautfenne-Jewer, Celia**

---

**From:** McAllister, Andrew  
**Sent:** May 2, 2024 5:27 PM  
**To:** Nguyen, Thuy  
**Cc:** Moroz, David  
**Subject:** RE: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

I will look at this tomorrow.

You can check the comment sheet that was part of the original ask.

Richard put his comments directly in that document.

Shouldn't be a problem to include more.

Andrew

Sent from my Bell Samsung device over Canada's largest network.

----- Original message -----

From: "Nguyen, Thuy" <Thuy.Nguyen@cnsccsn.gc.ca>  
Date: 2024-05-02 5:03 p.m. (GMT-05:00)  
To: "McAllister, Andrew" <Andrew.McAllister@cnsccsn.gc.ca>  
Cc: "Moroz, David" <david.moroz@cnsccsn.gc.ca>  
Subject: RE: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

Andrew, that's too bad, we will be more mindful and coordinate better next time. Richard is away till next Wednesday.

Nevertheless, here are what we came up so far:

5.50 (a)	For the mechanical and electrical parts of units containing highly radioactive material, the design of the layout and of the equipment should allow for adequate remote maintenance and replacement operations where possible (e.g. using remote handling tools or manipulators).	Suggest to remove "master-slave" terminology throughout document.
8.14 (a)	Use of remote handling tools, manipulators and other remote equipment (in highly radioactive areas);	Suggest to remove "master-slave" terminology throughout document.
8.102	Periodic testing, inspection and maintenance of devices associated with fire detection and suppression systems and fire response equipment (e.g. fire detectors, sprinklers, fire dampers, hydrants, firewater supply pumps, fire extinguishers, fire brigade equipment, etc);	Include fire response equipment.

8.102	Fire response drills, including the involvement of off-site emergency services (see also para. 9.112 of SSR-4 [1]);	Used of fire response drills terminology to remove any confusion between fire drills (i.e. building evacuation, assembly and accounting) and fire response drills (i.e. fire drills with a firefighting component).
8.99	Pre-fire plans that identify hazards present in the facility must be developed to assist fire response agencies.	Pre-fire plans identify the location of staged fire response equipment (ie. stand pipes and fire extinguishers) and identify hazards that are present in the room or building floor/elevation. These can be used by fire response agencies to gain situational awareness of hazards in the area outside of the fire hazard.

**From:** McAllister, Andrew <Andrew.McAllister@cncs-ccsn.gc.ca>

**Sent:** Thursday, May 2, 2024 4:51 PM

**To:** Nguyen, Thuy <Thuy.Nguyen@cncs-ccsn.gc.ca>

**Cc:** Moroz, David <david.moroz@cncs-ccsn.gc.ca>

**Subject:** RE: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSCC) – Step 11

Hi there,

I've already submitted the gathered comments to RFSC

I believe Richard Tennant provided a couple of EMPD comments in what i submitted. Please check with him and let me know.

Cheers

Andrew

Sent from my Bell Samsung device over Canada's largest network.

----- Original message -----

**From:** "Nguyen, Thuy" <Thuy.Nguyen@cncs-ccsn.gc.ca>

**Date:** 2024-05-02 4:25 p.m. (GMT-05:00)

**To:** "McAllister, Andrew" <Andrew.McAllister@cncs-ccsn.gc.ca>

**Cc:** "Moroz, David" <david.moroz@cncs-ccsn.gc.ca>

**Subject:** FW: For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSCC) – Step 11

Andrew,

I hope you are well. Just a heads up, EMPD have some comments that I will submit tomorrow. I noted that comments are due on the 29<sup>th</sup> April but the CNSC has till the 13<sup>th</sup> May to submit to the IAEA. Sincere apologies on our lateness, but I hope it's ok with you. Please let me know otherwise.

Thanks,

Thuy

**Thuy Nguyen**

Acting Director  
Emergency Management Program division  
Canadian Nuclear Safety Commission  
[Thuy.Nguyen@cnscccsn.gc.ca](mailto:Thuy.Nguyen@cnscccsn.gc.ca)  
1-343-998-9687

---

**From:** Persaud, Amar <[amar.persaud@cnscccsn.gc.ca](mailto:amar.persaud@cnscccsn.gc.ca)> **On Behalf Of** Regulatory Framework Steering Committee / Comité directeur du Cadre de réglementation (CNSC /CCSN)  
**Sent:** Friday, April 5, 2024 11:09 AM  
**To:** CNSC.F RFSC Members / Membres CDCR F.CCSN <[cnscc.f.rfscmembers-membrescdcrr.f.ccsn@cnscccsn.gc.ca](mailto:cnscc.f.rfscmembers-membrescdcrr.f.ccsn@cnscccsn.gc.ca)>  
**Cc:** Carrière, Danielle <[Danielle.Carriere@cnscccsn.gc.ca](mailto:Danielle.Carriere@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Regulatory Framework Steering Committee / Comité directeur du Cadre de réglementation (CNSC /CCSN) <[rfsc-cdcr@cnscccsn.gc.ca](mailto:rfsc-cdcr@cnscccsn.gc.ca)>; RPD Support Group / Groupe de soutien de la DPR (CNSC/CCSN) <[rpdsrg-sdpr@cnscccsn.gc.ca](mailto:rpdsrg-sdpr@cnscccsn.gc.ca)>  
**Subject:** For action: Due date: April 29 - IAEA Committee Level Review - DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11

Good day,

This is to advise Regulatory Framework Steering Committee (RFSC) members that the IAEA has recently posted the following draft for NUSSC Committee-level review:

**DS518A – Safety of Nuclear Fuel Reprocessing Facilities (Lead: NUSSC) – Step 11**

Due to IAEA: 13 May 2024  
Proposed Internal deadline: 29 April 2024  
Lead review division: NPPD (Andrew McAllister)  
There were no comments from Canada in Step 8

**Attached Documents (3x)**

- DS518A Safety of Nuclear Fuel Reprocessing Facilities Stepp 11 (E-doc: 7254278)
- DS518A Comment Table (E-doc: 7254375)
- DS518A Safety of Nuclear Fuel Reprocessing Facilities Stepp 11 Track Changes (E-doc: 7254292)

RFSC DGs are requested to determine if their directorate will take part in the review of the draft standard.

Please submit comments to technical lead, Andrew McAllister, by April 29, 2024. (The IAEA deadline is May 13, 2024)

Thank you for your attention to this matter.

Regulatory Framework Steering Committee (RFSC) /  
Comité directeur du Cadre de réglementation (CDCR)  
Email: [rfsc-cdcr@cnscccsn.gc.ca](mailto:rfsc-cdcr@cnscccsn.gc.ca)

## Hautfenne-Jewer, Celia

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**From:** McAllister, Andrew  
**Sent:** March 14, 2025 2:04 PM  
**To:** Media relations / Relations avec les médias (CNSC/CCSN); Burton, Patrick; Islam, Wasif  
**Cc:** Greencorn, Nancy; Ramsey, Renee; Sampat, Upasana  
**Subject:** RE: For SME input by noon Media request - Le Soleil/Enriched Uranium

Hi there,

Nancy is on her way to the airport to fly overseas.

As such, as acting DG for DNCFR, please proceed.

Cheers,

Andrew

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**From:** Media relations / Relations avec les médias (CNSC/CCSN) <media@cnsccsn.gc.ca>  
**Sent:** March 14, 2025 1:53 PM  
**To:** Burton, Patrick <Patrick.Burton@cnsccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnsccsn.gc.ca>; Media relations / Relations avec les médias (CNSC/CCSN) <media@cnsccsn.gc.ca>; Islam, Wasif <Wasif.Islam@cnsccsn.gc.ca>  
**Cc:** Greencorn, Nancy <nancy.greencorn@cnsccsn.gc.ca>; Ramsey, Renee <renee.ramsey@cnsccsn.gc.ca>; Sampat, Upasana <upasana.sampat@cnsccsn.gc.ca>  
**Subject:** RE: For SME input by noon Media request - Le Soleil/Enriched Uranium

Thank you so much Andrew and Patrick! Send it up now, will let you know if we need anything else.

Cheers,  
U.

**Upasana Sampat**  
(she/her/elle)

Communications Advisor, Regulatory Communications  
Strategic Communications Directorate / Regulatory Affairs Branch  
Canadian Nuclear Safety Commission / Government of Canada  
[Upasana.Sampat@cnsccsn.gc.ca](mailto:Upasana.Sampat@cnsccsn.gc.ca) / Tel: 343-550-0453

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Commission canadienne de sûreté nucléaire / Gouvernement du Canada  
[Upasana.Sampat@cnsccsn.gc.ca](mailto:Upasana.Sampat@cnsccsn.gc.ca) / Tél. cell : 343-550-0453

---

**From:** Burton, Patrick <Patrick.Burton@cnsccsn.gc.ca>  
**Sent:** March 14, 2025 1:27 PM  
**To:** McAllister, Andrew <Andrew.McAllister@cnsccsn.gc.ca>; Media relations / Relations avec les médias (CNSC/CCSN) <media@cnsccsn.gc.ca>; Islam, Wasif <Wasif.Islam@cnsccsn.gc.ca>  
**Cc:** Greencorn, Nancy <nancy.greencorn@cnsccsn.gc.ca>; Ramsey, Renee <renee.ramsey@cnsccsn.gc.ca>; Sampat,

Upasana <upasana.sampat@cnscccsn.gc.ca>

**Subject:** RE: For SME input by noon Media request - Le Soleil/Enriched Uranium

This works well for me,

PB

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>

**Sent:** March 14, 2025 12:42 PM

**To:** Media relations / Relations avec les médias (CNSC/CCSN) <media@cnscccsn.gc.ca>; Burton, Patrick <Patrick.Burton@cnscccsn.gc.ca>; Islam, Wasif <Wasif.Islam@cnscccsn.gc.ca>

**Cc:** Greencorn, Nancy <nancy.greencorn@cnscccsn.gc.ca>; Ramsey, Renee <renee.ramsey@cnscccsn.gc.ca>; Sampat, Upasana <upasana.sampat@cnscccsn.gc.ca>

**Subject:** RE: For SME input by noon Media request - Le Soleil/Enriched Uranium

Hi there,

See my tweak to address part of Ramzi's ask

Existing Canadian nuclear power plants do not use enriched uranium fuel. The existing technology in Canada is CANDU and they use natural uranium fuel. Canadian research reactors use low enriched uranium fuel, having converted from highly enriched uranium fuel previously. This low enriched uranium fuel is imported into Canada for use in the research reactors and must meet all applicable regulatory requirements. CNSC staff conduct planned and focused compliance verification activities to ensure the health and safety of people and the environment. All Canadian facilities are subject to IAEA safeguards inspections.

Canadian nuclear fuel cycle facilities are licensed to commercially produce natural uranium fuel cycle products (e.g., fuel bundles) and are neither licensed to nor capable of enriching uranium. Uranium enrichment technology is very specialized and tightly controlled. There are no proposed projects which would enable uranium enrichment. Any future proposed projects would be subject to the CNSC's rigorous licensing process.

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**From:** Media relations / Relations avec les médias (CNSC/CCSN) <media@cnscccsn.gc.ca>

**Sent:** March 14, 2025 10:39 AM

**To:** Burton, Patrick <Patrick.Burton@cnscccsn.gc.ca>; Islam, Wasif <Wasif.Islam@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>

**Cc:** Greencorn, Nancy <nancy.greencorn@cnscccsn.gc.ca>; Ramsey, Renee <renee.ramsey@cnscccsn.gc.ca>; Sampat, Upasana <upasana.sampat@cnscccsn.gc.ca>; Media relations / Relations avec les médias (CNSC/CCSN) <media@cnscccsn.gc.ca>

**Subject:** For SME input by noon Media request - Le Soleil/Enriched Uranium

Hi all,

We received some feedback from Ramzi on our proposed response to Le Soleil, which I've incorporated below in orange. Could you please take a look to verify it's technically correct? Feel free to edit/delete/add.

Ramzi also asked to add on the "*fact that all HEU fuel in research reactors were repatriated to the US, years ago, and these research reactors were decommissioned. The existing research reactor's fuel was converted to LEU*". Could you share some info on that which we could include in the response below?

Happy to jump on a call if its easier.

Thank you,  
U.

<b>Level</b>	Medium (EVP ROB + VP RAB)
<b>Deadline</b>	March 14, 2025
<b>SME</b>	Andrew McAllister, Director (NFPD) Wasif Islam, Director (CNLRPD) Patrick Burton, Director (UMMD) Nancy Greencorn, A/DG (DNCFR)
<b>Outlet</b>	Le Soleil
<b>Reporter</b>	Jean-François Cliche
<b>Topic</b>	Enriched Uranium
<b>Date received</b>	March 12, 2025
<b>Question(s)</b>	<b>FR (original request)</b>  J'aimerais avoir des info sur l'importation d'uranium enrichi des États-Unis. Quels réacteurs en ont besoin ? Pourquoi est-ce que les usines de concentration canadiennes ne peuvent pas produire l'uranium ? Et est-ce qu'il y a des projets d'usines au Canada qui devraient couvrir ces besoins-là dans un avenir prévisible ?  <b>EN</b> I'd like to have some information on the import of enriched uranium from the United States. Which reactors need it? Why can't Canadian mills produce the enriched uranium? And are there any mill projects in Canada that should cover these needs in the foreseeable future?

**Proposed response:** *(to be translated in French before responding to the journalist)*

Existing Canadian nuclear power plants do not use enriched uranium fuel. The existing technology in Canada is CANDU and they use natural uranium fuel. Canadian research reactors use low enriched uranium fuel. This fuel is imported into Canada for use in the research reactors and must meet all applicable regulatory requirements. CNSC staff conduct planned and focused compliance verification activities to ensure the health and safety of people and the environment. All Canadian facilities are subject to IAEA safeguards inspections.

Canadian nuclear fuel cycle facilities are licensed to commercially produce natural uranium fuel cycle products (e.g., fuel bundles) and are neither licensed to nor capable of enriching uranium. Uranium enrichment technology is very specialized and tightly controlled. There are no proposed projects which would enable uranium enrichment. Any future proposed projects would be subject to the CNSC's rigorous licensing process.

**Upasana Sampat**  
(she/her/elle)

Communications Advisor, Regulatory Communications  
Strategic Communications Directorate / Regulatory Affairs Branch  
Canadian Nuclear Safety Commission / Government of Canada

[Upasana.Sampat@cnscccsn.gc.ca](mailto:Upasana.Sampat@cnscccsn.gc.ca) / Tel: 343-550-0453

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Direction des communications stratégiques / Direction générale des affaires réglementaires  
Commission canadienne de sûreté nucléaire / Gouvernement du Canada  
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## Hautfenne-Jewer, Celia

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**From:** McAllister, Andrew  
**Sent:** March 12, 2025 2:16 PM  
**To:** Media relations / Relations avec les médias (CNSC/CCSN); Burton, Patrick; Islam, Wasif  
**Cc:** Ramsey, Renee; Sampat, Upasana; Greencorn, Nancy  
**Subject:** RE: For SME input: Media request - Le Soleil/Enriched Uranium

Hi there,

Here are my responses, subject to Wasif's confirmation/input (I am mindful of ZED-2 and other CRL activities)

1. Which reactors need it?
  - Existing Canadian nuclear power plants do not use enriched uranium fuel, they use natural uranium fuel.
  - Canadian research reactors use low enriched uranium (LEU) fuel. This LEU fuel was imported into Canada for use in the research reactors, meeting all applicable regulatory requirements.
2. Why can't Canadian mills produce the enriched uranium?
  - Canadian nuclear fuel cycle facilities are licensed to commercially produce natural uranium fuel cycle products (e.g., fuel bundles), not enriched uranium.
  -
3. And are there any mill projects in Canada that should cover these needs in the foreseeable future?
  - See response to #2
  - Any future proposed projects will be assessed through the regulatory framework in place at the time.

Thanks,

Andrew

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**From:** Media relations / Relations avec les médias (CNSC/CCSN) <media@cnscccsn.gc.ca>  
**Sent:** March 12, 2025 12:14 PM  
**To:** Burton, Patrick <Patrick.Burton@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Islam, Wasif <Wasif.Islam@cnscccsn.gc.ca>  
**Cc:** Ramsey, Renee <renee.ramsey@cnscccsn.gc.ca>; Media relations / Relations avec les médias (CNSC/CCSN) <media@cnscccsn.gc.ca>; Sampat, Upasana <upasana.sampat@cnscccsn.gc.ca>; Greencorn, Nancy <nancy.greencorn@cnscccsn.gc.ca>  
**Subject:** RE: For SME input: Media request - Le Soleil/Enriched Uranium

Thank you, Patrick! I've updated the SME field and included Nancy as A/DG.

Over to you Andrew and Wasif!

U.

**Upasana Sampat**  
(she/her/elle)

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Strategic Communications Directorate / Regulatory Affairs Branch  
Canadian Nuclear Safety Commission / Government of Canada  
[Upasana.Sampat@cnscccsn.gc.ca](mailto:Upasana.Sampat@cnscccsn.gc.ca) / Tel: 343-550-0453

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Commission canadienne de sûreté nucléaire / Gouvernement du Canada  
[Upasana.Sampat@cnscccsn.gc.ca](mailto:Upasana.Sampat@cnscccsn.gc.ca) / Tél. cell : 343-550-0453

---

**From:** Burton, Patrick <[Patrick.Burton@cnscccsn.gc.ca](mailto:Patrick.Burton@cnscccsn.gc.ca)>  
**Sent:** March 12, 2025 12:05 PM  
**To:** Media relations / Relations avec les médias (CNSC/CCSN) <[media@cnscccsn.gc.ca](mailto:media@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Islam, Wasif <[Wasif.Islam@cnscccsn.gc.ca](mailto:Wasif.Islam@cnscccsn.gc.ca)>  
**Cc:** Sampat, Upasana <[upasana.sampat@cnscccsn.gc.ca](mailto:upasana.sampat@cnscccsn.gc.ca)>; Ramsey, Renee <[renee.ramsey@cnscccsn.gc.ca](mailto:renee.ramsey@cnscccsn.gc.ca)>  
**Subject:** RE: For SME input: Media request - Le Soleil/Enriched Uranium

This one would be better looked at by Andrew McAllister and Wasif Islam – they are both cc'd! And, Nancy Greencorn is A/DG this week, it will be Andrew McAllister next week.

PB

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**From:** Media relations / Relations avec les médias (CNSC/CCSN) <[media@cnscccsn.gc.ca](mailto:media@cnscccsn.gc.ca)>  
**Sent:** March 12, 2025 11:26 AM  
**To:** Burton, Patrick <[Patrick.Burton@cnscccsn.gc.ca](mailto:Patrick.Burton@cnscccsn.gc.ca)>  
**Cc:** Media relations / Relations avec les médias (CNSC/CCSN) <[media@cnscccsn.gc.ca](mailto:media@cnscccsn.gc.ca)>; Sampat, Upasana <[upasana.sampat@cnscccsn.gc.ca](mailto:upasana.sampat@cnscccsn.gc.ca)>; Ramsey, Renee <[renee.ramsey@cnscccsn.gc.ca](mailto:renee.ramsey@cnscccsn.gc.ca)>  
**Subject:** For SME input: Media request - Le Soleil/Enriched Uranium  
**Importance:** High

Hi Patrick,

We have a media request from Le Soleil with some questions around Enriched Uranium. I've translated the questions in English for ease of reference. I've also drafted a proposed response based on my understanding, but I may be completely off base here. Could you please take a look and provide input? Please let me know if any other SMEs should be consulted.

If you could get back to us by 4 p.m. today that would be greatly appreciated, as it will give us time to get the rest of the approvals.

Thank you in advance for your support.  
Let me know if you have any questions!

<b>Level</b>	Medium (EVP ROB + VP RAB likely)
<b>Deadline</b>	March 14, 2025 EOD
<b>SME</b>	Andrew McAllister, Director (NFPD) Wasif Islam, Director (CNLRPD) Nancy Greencorn, A/DG (DNCFR)

<b>Outlet</b>	Le Soleil
<b>Reporter</b>	Jean-François Cliche
<b>Topic</b>	Enriched Uranium
<b>Date received</b>	March 12, 2025
<b>Question(s)</b>	<p><b>FR (original request)</b></p> <p>J'aimerais avoir des info sur l'importation d'uranium enrichi des États-Unis. Quels réacteurs en ont besoin ? Pourquoi est-ce que les usines de concentration canadiennes ne peuvent pas produire l'uranium ? Et est-ce qu'il y a des projets d'usines au Canada qui devraient couvrir ces besoins-là dans un avenir prévisible ?</p> <p><b>EN</b></p> <p>I'd like to have some information on the import of enriched uranium from the United States.</p> <ol style="list-style-type: none"> <li>1. Which reactors need it?</li> <li>2. Why can't Canadian mills produce the enriched uranium?</li> <li>3. And are there any mill projects in Canada that should cover these needs in the foreseeable future?</li> </ol>

**Proposed response:** *(to be translated in French before responding to the journalist)*

1. Which reactors need it?
  - No Canadian reactors required enriched uranium.
2. Why can't Canadian mills produce the enriched uranium?
  - Canadian reactors do not need it. It is expensive and would probably affect our international non-proliferation requirements.
3. And are there any mill projects in Canada that should cover these needs in the foreseeable future?
  -

**Upasana Sampat**  
(she/her/elle)

Communications Advisor, Regulatory Communications  
Strategic Communications Directorate / Regulatory Affairs Branch  
Canadian Nuclear Safety Commission / Government of Canada  
[Upasana.Sampat@cnsccsn.gc.ca](mailto:Upasana.Sampat@cnsccsn.gc.ca) / Tel: 343-550-0453

Conseillère en communications, Communications réglementaires  
Direction des communications stratégiques / Direction générale des affaires réglementaires  
Commission canadienne de sûreté nucléaire / Gouvernement du Canada  
[Upasana.Sampat@cnsccsn.gc.ca](mailto:Upasana.Sampat@cnsccsn.gc.ca) / Tél. cell : 343-550-0453

**Hautfenne-Jewer, Celia**

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**From:** Amalraj, Julian  
**Sent:** October 15, 2024 1:43 PM  
**To:** Munezero, Gretta; Prosofsky, Carol  
**Cc:** McAllister, Andrew; Vary, Beth; Duchesne, Daniel  
**Subject:** RE: Moltex Service Agreement signatures

Hi Gretta,

Based on feedback from Samy E-Jaby on the Bruce agreement, we (NPF) have to send the Moltex agreement to Moltex for signatures.

- Please get two signed copies from the Presidents Office and send them to Moltex by Fed Ex or Courier (address provided in the agreement). With instructions to return one signed copy back us.

I will inform Moltex [REDACTED] to expect this from us.

Julian

---

**From:** Amalraj, Julian  
**Sent:** October 15, 2024 12:41 PM  
**To:** Crowe, Heather <heather.crowe@cnscccsn.gc.ca>; Munezero, Gretta <gretta.munezero@cnscccsn.gc.ca>; Prosofsky, Carol <carol.prosofsky@cnscccsn.gc.ca>  
**Cc:** McAllister, Andrew <andrew.mcallister@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <daniel.duchesne@cnscccsn.gc.ca>  
**Subject:** RE: Moltex Service Agreement signatures

Hi Heather,

I noticed that the Moltex Service agreement has been signed by the President on Oct 8<sup>th</sup>, 2024.

As a next step, we need the vendor (moltex) to sign this agreement.

Could you please advise, if the President's office will send the two copies to Moltex for signatures or you will need NPF support in doing this.

Please advise,

Julian

## Hautfenne-Jewer, Celia

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**From:** Amalraj, Julian  
**Sent:** October 15, 2024 12:41 PM  
**To:** Crowe, Heather; Munezero, Gretta; Prosofsky, Carol  
**Cc:** McAllister, Andrew; Vary, Beth; Duchesne, Daniel  
**Subject:** RE: Moltex Service Agreement signatures

Hi Heather,

I noticed that the Moltex Service agreement has been signed by the President on Oct 8<sup>th</sup>, 2024.

As a next step, we need the vendor (moltex) to sign this agreement.

Could you please advise, if the President's office will send the two copies to Moltex for signatures or you will need NFPD support in doing this.

Please advise,

Julian

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** October 17, 2024 9:48 AM  
**To:** Munezero, Gretta; Olivier Gregoire  
**Cc:** McAllister, Andrew; Vary, Beth; Duchesne, Daniel; Gosselin, Danika; El-Jaby, Samy  
**Subject:** RE: Moltex Service Agreement signatures  
**Attachments:** Moltex\_WATSS\_Service\_Agreement.pdf; #7385021-  
Moltex\_Service\_Agreement\_-\_Letter\_Amalraj\_Julian\_to\_Gregoire\_O\_-\_for\_Final\_Approval.  
DOCX.DRF

Hi Gretta,

As per feedback I received from DART on the Bruce agreement, we can get the signatures electronically and file them.

Please see attached a cover letter to Moltex and the signed Moltex\_WATSS agreement for your perusal.

Please send this to [REDACTED]@moltexenergy.com  
Requesting that they send it back electronically as well.

Julian

---

**From:** Gosselin, Danika <danika.gosselin@cnscccsn.gc.ca>  
**Sent:** October 16, 2024 12:42 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <ROBEVPOsupport@cnscccsn.gc.ca>; Laroy, Marie <marie.laroy@cnscccsn.gc.ca>; Munezero, Gretta <gretta.munezero@cnscccsn.gc.ca>  
**Subject:** RE: Moltex Service Agreement signatures

Hi Julian,

Please find attached, an offline copy of the Service Agreement.

Please let me know if you require any other documents.

Thank you!



---

**From:** Gosselin, Danika  
**Sent:** Tuesday, October 15, 2024 4:28 PM  
**To:** Amalraj, Julian <julian.amalraj@cnscccsn.gc.ca>  
**Cc:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <ROBEVPOsupport@cnscccsn.gc.ca>; Laroy, Marie <marie.laroy@cnscccsn.gc.ca>; Munezero, Gretta <gretta.munezero@cnscccsn.gc.ca>  
**Subject:** RE: Moltex Service Agreement signatures

Hi Julian,

I will get back to you tomorrow with the offline copies.

To confirm, you will need an offline copy of the Service Agreement, and what else?

Thank you!



---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** Tuesday, October 15, 2024 4:03 PM

**To:** Gosselin, Danika <[danika.gosselin@cnscccsn.gc.ca](mailto:danika.gosselin@cnscccsn.gc.ca)>

**Cc:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <[ROBEVPOSupport@cnscccsn.gc.ca](mailto:ROBEVPOSupport@cnscccsn.gc.ca)>; Laroy, Marie <[marie.laroy@cnscccsn.gc.ca](mailto:marie.laroy@cnscccsn.gc.ca)>; Munezero, Gretta <[gretta.munezero@cnscccsn.gc.ca](mailto:gretta.munezero@cnscccsn.gc.ca)>

**Subject:** RE: Moltex Service Agreement signatures

Thank you Danika.

For this purpose, we need two signed original copies so that we may send it to Moltex requesting their signature.

Could you please advise how we can get them.

Julian

---

**From:** Gosselin, Danika <[danika.gosselin@cnscccsn.gc.ca](mailto:danika.gosselin@cnscccsn.gc.ca)>

**Sent:** October 15, 2024 3:44 PM

**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Cc:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <[ROBEVPOSupport@cnscccsn.gc.ca](mailto:ROBEVPOSupport@cnscccsn.gc.ca)>; Laroy, Marie <[marie.laroy@cnscccsn.gc.ca](mailto:marie.laroy@cnscccsn.gc.ca)>

**Subject:** RE: Moltex Service Agreement signatures

Hi Julian,

It is your office that will send it out to Moltex requesting for their signature.

Once it is signed and returned, the signed copy will need to be added to CCM and the "Y" next to pending action will need to be removed, and docket closed.

Thank you!



---

**From:** Crowe, Heather <[Heather.Crowe@cnscccsn.gc.ca](mailto:Heather.Crowe@cnscccsn.gc.ca)>

**Sent:** Tuesday, October 15, 2024 12:56 PM

**To:** ROBEVPO Support / DGROPVP groupe de soutien (CNSC/CCSN) <[ROBEVPOSupport@cnscccsn.gc.ca](mailto:ROBEVPOSupport@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Cc:** CEO President / PD Président (CNSC/CCSN) <[President-CEO@cnscccsn.gc.ca](mailto:President-CEO@cnscccsn.gc.ca)>

**Subject:** FW: Moltex Service Agreement signatures

Hi Danika, Could you provide guidance to Julian on his question?

Thank you very much,

Heather

Heather Crowe

*(she/her/elle)*

Chief of Staff

President's Office

Canadian Nuclear Safety Commission | Government of Canada

[heather.crowe@cnscccsn.gc.ca](mailto:heather.crowe@cnscccsn.gc.ca) | Tel: 343-549-6554

Chef de Cabinet

Bureau du président

Commission canadienne de sûreté nucléaire | Gouvernement du Canada

[heather.crowe@cnscccsn.gc.ca](mailto:heather.crowe@cnscccsn.gc.ca) | Tél: 343-549-6554

My working hours may differ from yours. Do not feel obliged to respond outside your working hours. / Mes heures de travail et les vôtres peuvent être différentes. Ne sentez pas obligé de répondre hors de vos heures de travail

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**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** Tuesday, October 15, 2024 12:41 PM

**To:** Crowe, Heather <[Heather.Crowe@cnscccsn.gc.ca](mailto:Heather.Crowe@cnscccsn.gc.ca)>; Munezero, Gretta <[gretta.munezero@cnscccsn.gc.ca](mailto:gretta.munezero@cnscccsn.gc.ca)>;

Prososfsky, Carol <[Carol.Prososfsky@cnscccsn.gc.ca](mailto:Carol.Prososfsky@cnscccsn.gc.ca)>

**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)>; Duchesne,

Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>

**Subject:** RE: Moltex Service Agreement signatures

Hi Heather,

I noticed that the Moltex Service agreement has been signed by the President on Oct 8<sup>th</sup>, 2024.

As a next step, we need the vendor (moltex) to sign this agreement.

Could you please advise, if the President's office will send the two copies to Moltex for signatures or you will need NPDF support in doing this.

Please advise,

Julian

**Directorate of Nuclear Cycle and Facilities Regulation****October 17, 2024****PROTECTED B****File No.: 2.02 / e-Doc No.: 7385021**

[REDACTED]  
 Moltex Energy Canada Inc.  
 200 Carmarthen Street, Saint John  
 Saint John, New Brunswick E2L 2P7L  
 Canada

**Subject: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility**

Dear [REDACTED]

I am pleased to inform you that President Tremblay has approved the service agreement for the Moltex Energy Canada Inc's WATSS facility project. I have enclosed a signed copy for your signatures. Please return one of the signed copies to me at your convenience and a second one is for you to retain for your records.

The next step in the process is to setup a meeting the initiate discussions on consultations as advised by Moltex and develop a project execution plan (PEP).

If you have any further questions, please do not hesitate to contact me:

Yours sincerely,

Julian Amalraj  
 Senior Project Officer, Nuclear Processing Facilities Division  
 Tel: (613) 818-0515  
 E-Mail: [julian.amalraj@cnsccsn.gc.ca](mailto:julian.amalraj@cnsccsn.gc.ca)

**Attachments:**

*Service Agreement Between Canadian Nuclear Safety Commission and Moltex Energy Canada Inc,*  
 e-Doc# 7257298.

c.c.: McAllister A, Siguoin L

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** June 3, 2024 9:27 AM  
**To:** Amalraj, Julian; Tabikh, Tarek; Belyea, Sean  
**Cc:** DeCoste, Laura; Brunarski, Lee; Henley, Tessa  
**Subject:** RE: Permission to share attached document externally

Good morning.

My two cents worth is that we recently had an ATIP on reprocessing.

In the release of those records, it did include this OIF. It also included emails pertaining to the formation of the NRCAN working group on reprocessing. Records related to the activities of the working group were considered Protected B (e.g, meeting summaries) and will not be released.

As such, given what was provided for this ATIP, providing this document to this Indigenous group seems reasonable.

Thanks

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Monday, June 3, 2024 9:11 AM  
**To:** Tabikh, Tarek <tarek.tabikh@cnscccsn.gc.ca>; Belyea, Sean <Sean.Belyea@cnscccsn.gc.ca>  
**Cc:** DeCoste, Laura <laura.decoste@cnscccsn.gc.ca>; Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>  
**Subject:** RE: Permission to share attached document externally

Hi Sean,

[REDACTED] sorry about the delayed response. The deliverable from this activity is to be an internal report with appropriate classification. NRCAN has requested that we do not share this report with any party outside the CNSC. So I am concerned that releasing this document outside the CNSC will mean possible engagement about the activities under this OIF – something that CNSC has been asked to refrain from.

Would it be possible for NRCAN to be consulted on this and maybe share the activities under the working group that was recently setup ?.


I would look to Lee for some advise here.


Julian

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*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** Tabikh, Tarek <[tarek.tabikh@cnscccsn.gc.ca](mailto:tarek.tabikh@cnscccsn.gc.ca)>  
**Sent:** Thursday, May 30, 2024 2:05 PM  
**To:** Belyea, Sean <[Sean.Belyea@cnscccsn.gc.ca](mailto:Sean.Belyea@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** DeCoste, Laura <[laura.decoste@cnscccsn.gc.ca](mailto:laura.decoste@cnscccsn.gc.ca)>  
**Subject:** RE: Permission to share attached document externally

Hi Sean,

From my perspective, it can be shared. I would ask we redact the target completion date, as I would want to avoid that date being thought of as a “promise” date.

Also, deliverable #2 speaks to supporting the policy decision on reprocessing. Julian will have a better handle on whether this information can be shared publicly at this point in time, as he has been directly involved with that specific WG.

Thanks,  
Tarek

---

**From:** Belyea, Sean <[Sean.Belyea@cnscccsn.gc.ca](mailto:Sean.Belyea@cnscccsn.gc.ca)>  
**Sent:** Thursday, May 30, 2024 11:00 AM  
**To:** Tabikh, Tarek <[tarek.tabikh@cnscccsn.gc.ca](mailto:tarek.tabikh@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** DeCoste, Laura <[laura.decoste@cnscccsn.gc.ca](mailto:laura.decoste@cnscccsn.gc.ca)>  
**Subject:** Permission to share attached document externally

Hi Julian and Tarek,

We have been requested by an Indigenous group to share the attached document with them.

Now that it is finalized, would we have your permission to do so?

If so, we (as in Laura likely) would redact any personal information and share a redacted PDF via email.

Sean Belyea  
Advanced Reactor Licensing Division / Division de l'autorisation des réacteurs avancés  
Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire  
Ottawa, Canada K1P 5S9  
[sean.belyea@cnscccsn.gc.ca](mailto:sean.belyea@cnscccsn.gc.ca)  
Telephone | Téléphone - 343-573-8179

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** April 15, 2025 11:19 AM  
**To:** Tran, Nhan; Posada, Lester  
**Subject:** RE: Pol 3 workplan and presentation to SMRLC

Thanks.

I've looked at this and have no comments per say, however, it appears that there is a smaller team for enrichment compared to reprocessing. For example, I believe that there are DERPA rep(s) on the reprocessing objective.

Do you feel confident that you have the right team assembled in light of the objective at hand and any lessons learned from the reprocessing objective?

Cheers,

Andrew

---

**From:** Tran, Nhan <Nhan.Tran@cnsccsn.gc.ca>  
**Sent:** April 10, 2025 2:49 PM  
**To:** McAllister, Andrew <Andrew.McAllister@cnsccsn.gc.ca>  
**Cc:** Posada, Lester <lester.posada@cnsccsn.gc.ca>  
**Subject:** Pol 3 workplan and presentation to SMRLC

Hey Andrew,

Attached are the Pol 3 work plan and associated presentation to SMRLC for your review and approval. The workplan has been reviewed by the team and everyone is on board with it; the presentation aligns with the work plan but wasn't shared with the team.

Deadline for submission is April 16 (next Wednesday), so please let us know if you have any comments or feedback for us in the next few days and we'll get those changes made to send it in.

Thanks,  
Nhan

### ***Nhan Tran***

**Acting Director/Directeur par interim**

**Reconciliation Policy and Public Programs Division/ Division de la politique sur la réconciliation et des programmes publics**

Canadian Nuclear Safety Commission/Commission canadienne de sûreté nucléaire

Cel: (343) 542-9173

[nhan.tran@cnsccsn.gc.ca](mailto:nhan.tran@cnsccsn.gc.ca)

Please don't feel obligated to respond outside of your regular work hours.  
Ne vous sentez pas obligé de répondre en dehors de vos heures de travail habituelles.

## Hautfenne-Jewer, Celia

---

**From:** Tran, Nhan  
**Sent:** April 15, 2025 11:33 AM  
**To:** McAllister, Andrew; Posada, Lester  
**Subject:** RE: Pol 3 workplan and presentation to SMRLC

Hey Andrew,

Yes, that came up at the launch meeting with Julian sharing his experience on Pol 4 as well. DERPA person was the one that came up the most in conversation that it'd be worth possibly pulling in. We can reach out to DERPA officially and ask for a resource or rather, put it to SMRLC and make it known that we'll ask soon after.

There was some talk of whether there'd be enough work focused on waste to have someone officially on the team or if it was enough to leave it as an on demand ask for review support when we get to it and we settled on that one being an on-demand request but I can check with John to see what his preference is as well.

Thanks,  
Nhan

### ***Nhan Tran***

Canadian Nuclear Safety Commission/Commission canadienne de sûreté nucléaire  
Cel: (343) 542-9173  
[nhan.tran@cnscccsn.gc.ca](mailto:nhan.tran@cnscccsn.gc.ca)

Please don't feel obligated to respond outside of your regular work hours.  
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---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** April 15, 2025 11:19 AM  
**To:** Tran, Nhan <Nhan.Tran@cnscccsn.gc.ca>; Posada, Lester <lester.posada@cnscccsn.gc.ca>  
**Subject:** RE: Pol 3 workplan and presentation to SMRLC

Thanks.

I've looked at this and have no comments per say, however, it appears that there is a smaller team for enrichment compared to reprocessing. For example, I believe that there are DERPA rep(s) on the reprocessing objective.

Do you feel confident that you have the right team assembled in light of the objective at hand and any lessons learned from the reprocessing objective?

Cheers,

Andrew

---

**From:** Tran, Nhan <Nhan.Tran@cnscccsn.gc.ca>  
**Sent:** April 10, 2025 2:49 PM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Cc:** Posada, Lester <lester.posada@cnscccsn.gc.ca>  
**Subject:** Pol 3 workplan and presentation to SMRLC

Hey Andrew,

Attached are the Pol 3 work plan and associated presentation to SMRLC for your review and approval. The workplan has been reviewed by the team and everyone is on board with it; the presentation aligns with the work plan but wasn't shared with the team.

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Thanks,  
Nhan

***Nhan Tran***

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Ne vous sentez pas obligé de répondre en dehors de vos heures de travail habituelles.

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** June 19, 2024 1:56 PM  
**To:** Amalraj, Julian  
**Subject:** RE: POL. 4 team meeting highlight (June 18, 2024)

Hi Julian,

Should these sort of updates be Protected B?

When I read it, it doesn't seem to be but you also sent a number of attachments. Again, not sure on the classification of those.

Cheers,

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Wednesday, June 19, 2024 1:48 PM  
**To:** Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Posada, Lester <lester.posada@cnscccsn.gc.ca>; Cochrane, Chris <chris.cochrane@cnscccsn.gc.ca>; Khotylev, Vladimir <Vladimir.Khotylev@cnscccsn.gc.ca>; Sivekumar, Dylan <Dylan.Sivekumar@cnscccsn.gc.ca>; Hamlat, Said <Said.Hamlat@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Miller, Douglass <Douglass.Miller@cnscccsn.gc.ca>  
**Cc:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** POL. 4 team meeting highlight (June 18, 2024)  
**Importance:** High

Hello POL.4 team members,

Please see attached highlights from our team meeting and key requests to tea members.

I provided an update on the status of the two Objectives POL. 3 & POL.4. This meeting primarily is related to POL.4 but the two objectives have some dependencies in terms of resources and stakeholder priorities.

Status so far:

POL.3: Objective is on HOLD at present. Expected to be restarted in August once resource commitments are confirmed.

- NRCAN / GAC have indicated that they are priority is changing from reprocessing to enrichment going forward. More clarity on how this change will be implemented in the next two weeks.
- SMR hub has requested a Project Change form to formally request change to schedule. In progress.
- 
- Project work on Literature review related to Enrichment technologies was in progress when the project was put on hold) some writeup completed.
- Information / Questionnaire related to enriched fuel supply and supply chain in progress. Data may be available with DART already. May want to send this to specific applicants/stakeholders.
- Project status reported as delayed (on HOLD) with less than 25% completed.

POL.4: Objective was kick started in Mid- May. Initial scoping and workplan discussion have happened. Team member contributions to work plan in progress.

- Change in priority yet to be fully scoped/planned. For now team working on developing a work plan.

POL.4 work package details:

- Preliminary literature review on reprocessing technologies / processes summary complete ( draft writeup attached herewith).
  - o Three major subprocesses identified
    - 1. Spent fuel handling/staging;
    - 2. Extraction of fissionable material and waste separation;
    - 3. Two paths identified 3a) Fissionable material handling/fuel manufacturing and 3b) Waste handling and disposal.
- Work plan in development key steps (in individual members area of expertise) identified include
  - o Literature review, (Applicable legislation, regulations, regdocs, IAEA standards, CSA standards, NSG guidelines etc etc) – Look at Regulatory framework, OPEX/Training of staff/expertise and any Licensing issues).
  - o Analysis (Identify any gaps, elucidate path forward, make conclusions and recommendations
  - o and Document/record results of analysis/documentation. Team has agreed that this will be an internal report.

Action to team members:

- Please provide a brief write up scope of work under your purview, and some brief timelines in terms of completing above work packages. Please send this by email to me by July 12<sup>th</sup>, 2024.
- Julian to provide a template for the workplan. Please see attached herewith the workplan template. Member inputs will be integrated and the draft workplan will be sent for team members to review before approval.

Any questions, please do not hesitate to reach out to me. I will be available by email (from Vienna next week).

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** June 19, 2024 2:03 PM  
**To:** McAllister, Andrew  
**Subject:** RE: POL. 4 team meeting highlight (June 18, 2024)

Hi Andrew,

So far this information (OIF, memo and workplan details) has been unclassified. For example the memo from Lester was based out of google information and the NRCAN presentation was distributed internally through email already. The OIF and Workplan is unclassified. But going forward, the results of the analysis and the internal report (“deliverables”) will be “prob-b”.

If it should be otherwise, let me know and we can update accordingly.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** Wednesday, June 19, 2024 1:56 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** RE: POL. 4 team meeting highlight (June 18, 2024)

Hi Julian,

Should these sort of updates be Protected B?

When I read it, it doesn't seem to be but you also sent a number of attachments. Again, not sure on the classification of those.

Cheers,

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**To:** Henley, Tessa <[tessa.henley@cnscccsn.gc.ca](mailto:tessa.henley@cnscccsn.gc.ca)>; Posada, Lester <[lester.posada@cnscccsn.gc.ca](mailto:lester.posada@cnscccsn.gc.ca)>; Cochrane, Chris <[chris.cochrane@cnscccsn.gc.ca](mailto:chris.cochrane@cnscccsn.gc.ca)>; Khotylev, Vladimir <[Vladimir.Khotylev@cnscccsn.gc.ca](mailto:Vladimir.Khotylev@cnscccsn.gc.ca)>; Sivekumar, Dylan <[Dylan.Sivekumar@cnscccsn.gc.ca](mailto:Dylan.Sivekumar@cnscccsn.gc.ca)>; Hamlat, Said <[Said.Hamlat@cnscccsn.gc.ca](mailto:Said.Hamlat@cnscccsn.gc.ca)>; Steedman, Gavin <[gavin.steedman@cnscccsn.gc.ca](mailto:gavin.steedman@cnscccsn.gc.ca)>; Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Miller, Douglass <[Douglass.Miller@cnscccsn.gc.ca](mailto:Douglass.Miller@cnscccsn.gc.ca)>  
**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>

**Subject:** POL. 4 team meeting highlight (June 18, 2024)

**Importance:** High

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  - o and Document/record results of analysis/documentation. Team has agreed that this will be an internal report.

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Any questions, please do not hesitate to reach out to me. I will be available by email (from Vienna next week).

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** May 7, 2024 8:22 AM  
**To:** Amalraj, Julian  
**Cc:** Ennis, Ashley  
**Subject:** RE: POL.4. Fuel reprocessing, recycling, and waste OIF

Done...thanks for the reminder

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Tuesday, May 7, 2024 8:20 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Cc:** Ennis, Ashley <Ashley.Ennis@cnscccsn.gc.ca>  
**Subject:** FW: POL.4. Fuel reprocessing, recycling, and waste OIF

Hi Andrew,

Following up to see if you can review and if OK sign this OIF. My team meeting to start the workplan is scheduled for this Friday and would like to have this approved by then.

Julian


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*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** Amalraj, Julian  
**Sent:** Wednesday, May 1, 2024 9:36 AM  
**To:** McAllister, Andrew <[andrew.mcallister@cnscccsn.gc.ca](mailto:andrew.mcallister@cnscccsn.gc.ca)>  
**Subject:** POL.4. Fuel reprocessing, recycling, and waste OIF

Hi Andrew,

This is for your final review / signatures. I have incorporated all comments and this document is ready for signatures.

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** January 8, 2025 8:41 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED] Kent, Michael; Gao, Henry; Kanasewich, Elaine; McAllister, Andrew; Prosser, Kathleen; Vary, Beth  
**Subject:** RE: Way forward  
**Importance:** High

Good Morning [REDACTED]

Happy New Year as well. Hope you are doing good.

CNSC staff took an action from our meeting on December 2<sup>nd</sup>, 2024 to clarify with the IAEA on the status of including the WATSS reprocessing facility under the MPSS process.

To this effect, CNSC staff have discussed this matter with the IAEA and the IAEA's response is that they would like to include the WATSS in the task of SBD for SMRs.

Looking to see if we can close the loop on this and setup what our review plan would look like to ensure we have proper resources allocated. I am proposing that we have another meeting in the week of January 20<sup>th</sup> onwards to discuss how to proceed.

Please advise.

Regards,

Julian Amalraj

---

**From:** [REDACTED] <[REDACTED]@moltexenergy.com>  
**Sent:** November 22, 2024 1:12 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** [REDACTED] <[REDACTED]@moltexenergy.com>; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Subject:** RE: Way forward

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Hi Julian,

Yes this would be suitable, thanks

[REDACTED]



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** November 22, 2024 11:26 AM

**To:** [Redacted] >

**Cc:** [Redacted]; Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Prosser, Kathleen <[kathleen.prosser@cnscccsn.gc.ca](mailto:kathleen.prosser@cnscccsn.gc.ca)>

**Subject:** RE: Way forward

Hi [Redacted]

Proposing that we meet Monday December 2<sup>nd</sup> (1 -2 pm) for this purpose based on CNSC staff personnel calendars.

Please advise if this works for Moltex.

Julian

**From:** [Redacted] <[\[Redacted\]@moltexenergy.com](mailto:[Redacted]@moltexenergy.com)>

**Sent:** November 18, 2024 3:19 PM

**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Cc:** [Redacted]; Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>

**Subject:** RE: Way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

Sorry for my late reply.

I agree that this kind of meeting with the proposed attendees should be the next step. On our side, the first half of the first week of December (Dec 2 – 4) would be suitable. Our availabilities would be far more limited until then.

Thanks





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200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** November 13, 2024 12:11 PM

**To:** [Redacted]  
**Cc:** [Redacted] ent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>

**Subject:** RE: Way forward

Hi [Redacted]

Yes, I can confirm the agreement is in place. As a start, would it be possible to have a meeting first with Moltex and CNSC staff to get clarity on what the current status is with regard to this issue (MSSP) and what is needed moving forward. This will also allow CNSC staff to understand better what we need to do to initiate these conversations with the IAEA.

I would propose our safeguards staff dealing with this issue and possibly one non-proliferation expert in this meeting so that we have the respective personnel up to date and agreement on what is needed as next steps.

Please advise and I will setup a meeting that is suitable for everybody,

Julian

---

**From:** [Redacted]  
**Sent:** November 7, 2024 10:53 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [Redacted]  
**Subject:** way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

Now that the agreement is in place, I guess that the process to broaden the MSSP to include WATSS should be cleared of any roadblocks. Do you have an idea of the current status? Should we have some coordination on the way forward?

Thanks





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---

**From:** [Redacted]  
**Sent:** October 31, 2024 10:01 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [Redacted]  
**Subject:** FW: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Hi Julian.

Here is the signed document.



If I send you the password by text message.



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---

**From:** Munezero, Gretta <[gretta.munezero@cnscccsn.gc.ca](mailto:gretta.munezero@cnscccsn.gc.ca)>

**Sent:** October 18, 2024 10:28 AM

**To** [Redacted]

**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Sigouin, Luc <[Luc.Sigouin@cnscccsn.gc.ca](mailto:Luc.Sigouin@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Subject:** For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Good day,

On behalf of Julian Amalraj, please find attached the service agreement for the Moltex Energy Canada Inc's WATSS facility project approved by President Tremblay.

I will be sending the password to the service agreement document in a separate email.

Could you please return electronically a signed copy when convenient?

*Please note, no hard copies will follow.*

Regards,

***Gretta Munezero***

Administrative Assistant, Nuclear Processing Facilities Division  
Canadian Nuclear Safety Commission | Government of Canada  
Adjoint administratif, Division des installations de traitement Nucléaires  
Commission canadienne de sûreté nucléaire | Gouvernement du Canada

**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** November 13, 2024 11:11 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED] Kanasewich, Elaine; McAllister, Andrew  
**Subject:** RE: Way forward

Hi [REDACTED]

Yes, I can confirm the agreement is in place. As a start, would it be possible to have a meeting first with Moltex and CNSC staff to get clarity on what the current status is with regard to this issue (MSSP) and what is needed moving forward. This will also allow CNSC staff to understand better what we need to do to initiate these conversations with the IAEA.

I would propose our safeguards staff dealing with this issue and possibly one non-proliferation expert in this meeting so that we have the respective personnel up to date and agreement on what is needed as next steps.

Please advise and I will setup a meeting that is suitable for everybody,

Julian

---

**From:** [REDACTED] <[REDACTED]@moltexenergy.com>  
**Sent:** November 7, 2024 10:53 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
[REDACTED]  
**Subject:** Way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Hello Julian,

Now that the agreement is in place, I guess that the process to broaden the MSSP to include WATSS should be cleared of any roadblocks. Do you have an idea of the current status? Should we have some coordination on the way forward?

Thanks

[REDACTED]

[REDACTED]



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7

From [REDACTED]

Sent: October 31, 2024 10:01 AM

To: Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

Cc: [REDACTED]

Subject: FW: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Hi Julian.

Here is the signed document.



[oliviergregoire@moltexenergy.com](mailto:oliviergregoire@moltexenergy.com)



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---

**From:** Munezero, Gretta <[gretta.munezero@cnscccsn.gc.ca](mailto:gretta.munezero@cnscccsn.gc.ca)>  
**Sent:** October 18, 2024 10:28 AM  
**To:** [REDACTED] <[\[REDACTED\]@moltexenergy.com](mailto:[REDACTED]@moltexenergy.com)>  
**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Sigouin, Luc <[Luc.Sigouin@cnscccsn.gc.ca](mailto:Luc.Sigouin@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Subject:** For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

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Could you please return electronically a signed copy when convenient?

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Regards,

***Gretta Munezero***

Administrative Assistant, Nuclear Processing Facilities Division  
Canadian Nuclear Safety Commission | Government of Canada  
Adjoint administratif, Division des installations de traitement Nucléaires  
Commission canadienne de sûreté nucléaire | Gouvernement du Canada

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** May 6, 2024 8:32 AM  
**To:** Boudrias, Geneviève; Brunarski, Lee  
**Subject:** recent ATIP and NRCan

Hi there,

In light of the response to the reprocessing ATIP, I would suggest that you reach out to your NRCan counterpart regarding the existence of the NRCan reprocessing working group as well as the industry Team Canada fuel supply group.

NRCan might want to get ahead of the curve in its communications with other stakeholders, such as NGOs.

Cheers,

Andrew



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This is great news for our customer Orano and for ETC: Orano has received planning permission for the €1.7 billion expansion of the Georges Besse 2 (GBII) uranium enrichment plant at the Tricastin site.

This expansion, which will increase capacity by more than 30% and create up to 1000 jobs on site, is an important milestone in increasing enrichment capacity in Europe.

We look forward to continuing our very close and trusting co-operation with Orano and are proud to be part of this major project. 🤝

**Pages 3931 to / à 3936  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**20(1)(b), 21(1)(a)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**



Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

# S&T Facilities and Projects Update

2024 December

CRL-CNNO-24-0001-P



## Safety & Important Information

- Winter driving:
  - Don't let your gas tank get below  $\frac{1}{4}$  tank in the winter
  - Ensure you have a winter emergency kit in your vehicle
  - Ensure you clean off your windshield and windshield wipers so they work effectively



# Agenda

- **Universal Cells (UC)**
- **Fuels and Materials Cells (FMC)**
- **Molybdenum-99 Production Facility (MPF)**
- **Nuclear Fuel Fabrication Facility (NFFF)**
- **Zed-2 Reactor**
- **Tritium Facility**
- **Recycled Fuel Fabrication Facility (RFFL)**
- **Combined Electrolysis and Catalytic Exchange Upgrading and Detritiation Test Facility (CECE-UD)**
- **Class II Facilities**
- **CRL Projects**
- **Reportable Events**

# Universal Cells Tony Scott



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4

A0120390\_4-003940

# CRL Universal Cells [REDACTED]

## Operational Update

- The Universal Cells (UC) has concentrated on routine work and the following projects and non-routine work packages:
- The Canadian Nuclear Laboratories (CNL) was contracted to conduct small scale experiments on the separation of plutonium and other transuranic (TRU) elements from spent CANDU nuclear fuel. This is phase 2 of the experiments for a customer with the first phase being completed in Fall 2023.
- UC has successfully received CANDU fuel using [REDACTED] flask and completed the non-destructive Post Irradiation Examination (PIE) campaign of the fuel. [REDACTED]  
[REDACTED]
- UC has successfully tested and completed the residual stress measurement of a pressure tube end fitting rolled joint.



# CRL Universal Cells [REDACTED]

## Operational Update (Actinium)

- UC has prepared [REDACTED] for Actinium production.
- The initial equipment has been installed and tested.
- UC has started the processing of the irradiated targets and purifying Ac-225.
- Environmental effluent monitoring has been installed, and the Engineering Change Control (ECC) is going through its process. CNL is collecting data from the effluent monitoring system and conservatively estimating the Radon and Thoron released from this new process until the ECC is completed and the system is declared operational.
- CNL remains committed to keep the releases As Low as Reasonably Achievable (ALARA) with administrative and action levels that will be set in accordance with CNL Environmental limits.



# CRL Universal Cells



## Planned Licensing Activities

- A Nuclear Safety Note is being prepared to address the production of Ac-225. The NSN will be submitted to the CNSC in 2025 Q3 and will be accompanied by an updated FA document.

## Inspection Responses

- UC participated in a CNSC Type II inspection in 2024 February. UC received 2 NNCs and 1 recommendation.
  - UC has completed and the CNSC has accepted the following NNC "CNL to develop and provide training to Universal Cells staff on waste segregation."
  - UC has completed the following recommendation "CNL should ensure that self-assessments are reviewed by department managers and subject matter experts and that the review is clearly documented, completed and signed."



# CRL Universal Cells [REDACTED]

## Facility Projects and Modifications

- UC has completed the installation of a [REDACTED] and has put the system in service.
- UC has completed the [REDACTED] ECC design phase 1. This project will be scheduled in the fiscal year 24/25.



# Molybdenum-99 Production Facility

## Tony Scott



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9

A0120390\_9-003945

# CRL Molybdenum-99 Production Facility

## Operational Update

- The Molybdenum-99 Production Facility (MPF) has focused on routine activities including:
  - Heating the [REDACTED] to ensure tank chemistry
  - Regular sampling of [REDACTED] to confirm tank chemistry
  - Reporting the result [REDACTED] sampling to the CNSC and the IAEA
- The MPF has begun installation of the new equipment in 2024 Q3 with commissioning beginning in 2025 Q1. Pumping is scheduled to begin in 2025 Q2.
- The MPF completed the big rinse of [REDACTED] to wash down any potential Uranium off the walls and piping into the heel for complete cementation. The MPF staff are working on analysing and documenting the findings.



# CRL Molybdenum-99 Production Facility

## Facility Projects and Modifications

- MPF has the following category 2 changes "In Construction":
  - Improve reliability for continuous [REDACTED]. Awaiting final engineering inspection.
  - Install transfer line from [REDACTED]  
Modifications to [REDACTED] are in progress and almost complete.
- Disconnecting UC from [REDACTED] has completed the design phase. A new phase was generated to balance the MPF ventilation after the UC is disconnected from [REDACTED]



# CRL Molybdenum-99 Production Facility

## Planned Licensing Activities

- MPF is in the process of updating the Criticality Safety Documents for [REDACTED] and the [REDACTED]. These documents have been delayed and will be submitted to the CNSC for information in 2025 Q1.
- MPF is updating the Facility Authorization document and will be submitting to the CNSC for information in 2025 Q1.

## Inspection Responses

- MPF does not have any open NNC's from CNSC inspections.

# Fuels and Materials Cells

## Matthew Crowe



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18

A0120390\_13-003949

# CRL Fuels and Materials Cells

## Operational Update

- The Fuels and Materials Cells (FMC) has completed routine work including a scrape campaign for Pickering (OPG).
- First targets for Ac-225 production completed and sent for irradiation.
- FIB-SEM manufacturer visited site to complete their commissioning work. CNL commissioning will take that work and identify any gaps with their commissioning plan. Inactive and active commissioning remains outstanding, once complete the FIB-FE SEM will be capable of active testing and ion beam milling of meso-scale specimens.



# CRL Fuels and Materials Cells [REDACTED]

## Facility Projects and Modifications

- The new floor installed in the [REDACTED] as a trial to mitigate the contamination events caused by peeling paint from the floor did not stand up to the flask weight placed on it during routine operations. A spray on epoxy covering is being tested in the NRX rod bays and may be used in FMC if it is successful there.
- DSC installation is continuing, this is a direct replacement for the existing capability.
- Additional MET sample polisher design completed and will be installed when an opening in the schedule allows.



# CRL Fuels and Materials Cells



## Planned Licensing Activities

The FMC is updating the Final Safety Analysis Report and the Facility Authorization as part of the routine scheduled updates. Safety Review Committee came back with a number of comments that are still being addressed. Planned submission to CNSC will be delayed to 2025 Q1.

## Inspection Responses

- No open NNC's





# Nuclear Fuel Fabrication Facility (NFFF) Matt Crowe



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17

A0120390\_17-003953

# Nuclear Fuel Fabrication Facility (NFFF)

## Operational Update

- Post operation clean-up activities ongoing.



# Nuclear Fuel Fabrication Facility (NFFF)

## Facility Projects and Modifications

- Work to remove legacy fuel fabrication equipment continues. [REDACTED] has been chosen as the future site of all [REDACTED] not slated to be transitioned to ANMRC. NRU fuel fabrication equipment will be removed and building modified to house these labs.
- A Detailed Decommissioning Plan is being prepared to bring the facility to its end state in preparation for renovations to house the class B labs.



# Nuclear Fuel Fabrication Facility (NFFF)

## Planned Licensing Activities

- Preparation of the Detailed Decommissioning Plan is ongoing.

## Inspection responses

- Finding from last inspection was closed out and accepted by CNSC.

# Zero Energy Deuterium (ZED-2) Reactor

## Matt Crowe



Canadian Nuclear Laboratories  
Laboratoires Nucleaires  
Canadiens

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# Zero Energy Deuterium (ZED-2) Reactor

## Operational Update

- Facility completed all planned operations for the fiscal year.
- Preparation for a moderator swap was started last quarter with an anticipated execution in January 2025.



# Zero Energy Deuterium (ZED-2) Reactor

## Facility Projects and Modifications

- Prototype testing of new log amplifiers continuing.
- Equipment upgrades in the counting lab that were started in February with the assistance of the nuclear response group have been completed. Counting lab returned to full operation with two available counters to complete customer work and facility calibrations.



# Zero Energy Deuterium (ZED-2) Reactor

## Planned Licensing Activities

- Planned update to the facility Safety Analysis Report and Facility Authorization documents is progressing. Anticipated submission date to the CNSC is 2025 Jun.

## Inspection responses

- No open NNC's.



# Tritium Facility Dawn Woods



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25

A0120390\_25-003961

# Tritium Facility

## Operational Update

- Nothing to report



# Tritium Facility

## Facility Projects and Modifications

### Category 1 changes

- none

### Category 2 changes

- Thermal Cycling Absorption (TCA) System design has been reviewed by Safety and Licensing and determined to be a Category 2 change.
- [REDACTED] Stay-In Button for Ventilation Change
- Tritiated Water Synthesis Rig
- Install Air Purged Enclosure 4



# Tritium Facility

## Planned Licensing Activities

- Unity-2 project submissions discussed in the project section

## Inspection responses

- No open NNCs



An aerial, black and white photograph of a forested area. A road or path winds through the trees, leading to a small building or structure. The overall image has a halftone or dithered texture.

# Recycle Fuel Fabrication Laboratories (RFFL) Dawn Woods



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A0120390\_29-003965

# Recycle Fuel Fabrication Laboratories

## Operational Update

- During a criticality drill at the end of 2023, it was noted that the occupants of a neighbouring building within the evacuation zone did not immediately evacuate because the alarms were not audible and they relied on a PA announcement to inform them of the alarm. In January this was determined to be reportable and all work with and movements [REDACTED] have been on hold since pending completion of an Engineering Change Control to install repeaters in neighbouring buildings.



# Recycle Fuel Fabrication Laboratories

## Facility Projects and Modifications

### Category 1 changes

- B375 - [REDACTED] This is in the design phase.



# Recycle Fuel Fabrication Laboratories

## Planned Licensing Activities

- Revision of the CSD started in February. Now targeting Q4 of FY 24/25
- Revision of the SAR is now underway. Currently scheduled for submission 2025 March

## Inspection responses

- A Type II Inspection was completed in 2024 March. All NNCs are closed.



An aerial, grayscale photograph of a forested area. A road winds through the trees, and a small building is visible in the center. The text 'CECE-UD Dawn Woods' is overlaid in white.

# CECE-UD Dawn Woods



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33

A0120390\_33-003969

# CECEUD

## Operational Update

- Post Operational Clean Out (POCO) is complete. Four shipments of waste, totalling 1.72m<sup>3</sup> was removed.
- A characterization plan is complete. This plan describes the sampling and analysis needed to safely remove, disposition and package the redundant equipment.



# CECEUD

## Facility Projects and Modifications

- CECEUD to move to a modernized facility
- As described in the Unity-2 Project update to follow, CNL plans to decommission [REDACTED] and expand the Tritium Facility into the space.

# CECEUD

## Planned Licensing Activities

- Discussed under Unity 2

## Inspection responses

- Nothing to report





# Class II Facilities

## Dawn Woods/Rebecca Mantha



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A0120390\_37-003973

# Class II Facilities

## Operational Update

- Van de Graaff nothing to report.
- [REDACTED] is partially back in service with the commissioning of the [REDACTED] neutron generator in January. Equipment repairs ongoing for the DD-109 neutron generator and upgrades to the [REDACTED] system.
- [REDACTED] has been out of service since November 2023 while the facility awaits the replacement for the [REDACTED] area radiation monitor.
- [REDACTED] remains operational, but upgrades are needed to replace some ageing equipment.



# Class II Facilities

## Facility Projects and Modifications

### Category 1 changes

- [REDACTED] Commissioning of interlocks and new neutron generator was completed.

### Category 2 changes

- [REDACTED] Shielding Requirements – construction has been completed and is now in close-out.
- [REDACTED] Area Monitor Replacement – design is almost completed.

No Category 1 or 2 changes for the other Class II facilities



# Class II Facilities

## Planned Licensing Activities

- [REDACTED] Facility Authorization update is underway to revise interlock testing frequency and RP requirements.
- [REDACTED] SAR revision is currently being planned for FY 2024/25.
- [REDACTED] SAR revision is currently being planned for FY 2024/25.

## Inspection responses

- None



Canadian Nuclear  
Laboratories

Laboratoires Nucléaires  
Canadiens

# CRL Projects



A0120390\_41-003977

# ANMRC

## Project Scope:

Design, build, commission a successor for [REDACTED]

## Project Schedule and Licensing Submissions

- 2-3 Project-specific regulatory updates per year
- Most recent update 2024 November; next update 2025 spring
- Latest discussions include engineering change control and design of specific systems
- Active commissioning in approximately 2029



## IAA Status:

Project assessed under CEAA 2012, Section 67.



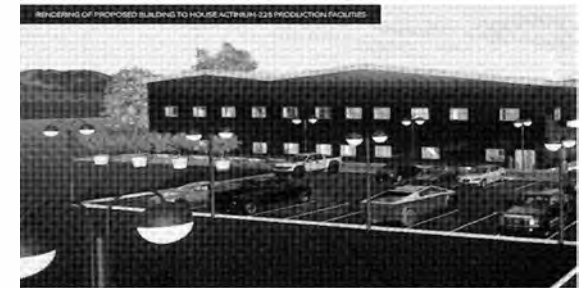
# Ac-225 Production Facility

## Project Scope:

**This project has been put on hold and an Initial Sales Project has been initiated.**

Design, licence, construct, commission and operate a Class II nuclear facility for bulk production capabilities of Ac-225 through irradiation of radium targets in a cyclotron.

## Project Schedule and Licensing Submissions



Rendering of Proposed Building to House AC-225 Production Facility

## IAA Status:

Section 82 Posting (83038) for geotechnical site investigations

# SMR Land Lease

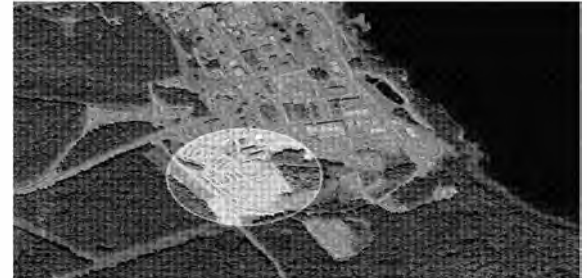
## Project Scope:

This project has been put on hold.

## Project Schedule and Licensing Submissions

## IAA Status:

N/A - there is no IAA submission required for the land lease



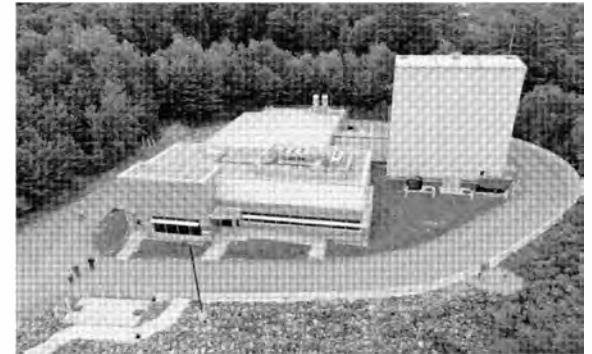
# UNITY-2

## Project Scope:

The primary objective of Unique Integrated Test Facility – 2 (UNITY-2) project is to plan, design, install and commission an integrated fusion fuel cycle test and recovery loop in the [REDACTED] – Tritium Facility. UNITY-2 will support the advancement of research and development of non-core fusion technologies.

## Project Schedule and Licensing Submissions

- Licensing Basis Assessment and Licensing Plan have been approved by the CNSC.
- The DDP will be submitted to the CNSC in Jan 2025 for the dismantling of [REDACTED]
- Dismantling is planned to mobilize in April 2025, planning to commence mobilization for building renovations in Spring 2026 and beginning operations in early 2027.



## IAA Status:

UNITY-2 is **not a New Build**, an Internal Environmental Review is ongoing.



# Facility Events Reported to CNSC Staff

To be reviewed by exception

ImpAct No	Title	Date of Occurrence	Responsible Manager/DROL
S&T-24-2244	[REDACTED]	9-Jul	Matt Crowe
S&T-24-3030	Worker injured while helping lift cart, over the Door sill to enter a building	10-Sep	Tony Scott
S&T-24-4032	Neutron generator getter valve being in the closed position does not prevent neutron production as it should	3-Dec	Rebecca Mantha





Thank you. Merci

Questions?



Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

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47

A0120390\_47-003983

**Pages 3984 to / à 3985  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**21(1)(a), 21(1)(b)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**



2024 December 19

Aidan Leach, Senior Nuclear Facility Site Inspector  
Canadian Nuclear Laboratories Regulatory Program Division  
Canadian Nuclear Safety Commission  
280 Slater Street  
P.O. Box 1046, Station B  
Ottawa, Ontario K1P 5S9

Dear Mr. Leach,

**Submission of the Time-Limited Amendments for the Moltex Irradiated Fuel Experiment**

The purpose of this letter is to submit to Canadian Nuclear Safety Commission (CNSC) staff the following Time-Limited Amendments (TLA) for the Moltex Irradiated Fuel Experiment (MIFE) being performed in the Universal Cells (UC) [1] and Fuels and Materials Cells (FMC) [2] facilities.

- Time-Limited Amendment to the Universal Cells Criticality Safety Document (CSD-28) for the Moltex Irradiated Fuel Experiment [1].
- Time-Limited Amendment to the Fuel & Materials Cells Criticality Safety Document (CSD-49) for the Moltex Irradiated Fuel Experiment [2].

Documents [1] [2] are provided as per Licence Conditions G.2 (Notification of Changes) and 4.2 (Nuclear Criticality Safety Program) of the Licence Conditions Handbook for Chalk River Laboratories [3].

Information on the documents [1] [2] as per the applicable notification-content requirements is as follows:

- The TLAs were written to allow the Moltex Irradiated Fuel Experiment to be conducted in the UC and FMC facilities. The documents outline the safety case and demonstrate that the operations will be subcritical under normal and credible abnormal conditions.
- The documents are temporary amendments to the respective Criticality Safety Documents for the UC and FMC facilities.

Chalk River Laboratories  
286 Plant Road  
Chalk River, Ontario  
Canada K0J 1J0  
Telephone: 613-584-3311  
Toll Free: 1-866-513-2325

Laboratoires de Chalk River  
286, chemin Plant  
Chalk River (Ontario) K0J 1J0  
Canada  
Téléphone: 613-584-3311  
Sans frais: 1-866-513-2325

190-CNNO-24-0005-L

- The described documents do not entail any activities outside of the existing licensing basis nor any alteration of it. There is no adverse impact on the health and safety of persons, security, the environment, or Canada's international obligations as a result of the change.

Please contact me directly if you should require any additional information or clarification regarding this submission.

Yours sincerely,



Ken Lundie  
 General Manager, Engineering  
 Phone: 613-639-4165  
 Email: ken.lundie@cnl.ca

Enclosure (2)

#### References:

- [1] CNL, *CSD-28 TLA – Moltex Irradiated Fuel Experiment*, [REDACTED] 123450-TLA-006804, Rev. 0, 2024 November 07 (enclosed).
- [2] CNL, *CSD-49 TLA – Moltex Irradiated Fuel Experiment*, 9420-123450-TLA-006803, Rev. 0, 2024 November 15 (enclosed).
- [3] CNSC, *Chalk River Laboratories Nuclear Research and Test Establishment Operating Licence*, Licence Conditions Handbook, NRTEOL-LCH-01.01/2028 (Revision 5), CRL-508760-HBK-002 (Revision 5), 2024 October 31.

c.	W. Islam (CNSC)	K. Khosravi (CNSC)	J. Sample (CNSC)	M. Sedrak (CNSC)
	<a href="mailto:forms-formulaires@cnsccsn.gc.ca">forms-formulaires@cnsccsn.gc.ca</a>			
	S. Brewer	S. Bushby	R. Dufour	C. Gallagher
	K. Leroux	J. Preston	A. Tisler	K. Whitham
	>CR CNSC Site Office	>CR Licensing	>SRC	

**Pages 3988 to / à 4010  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**16(2)(c), 68.2**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

## Hautfenne-Jewer, Celia

---

**Subject:** FW: IIC/NRCAN/GAC/ISED - Post Federal Roundtable Discussion  
**Location:** Microsoft Teams Meeting

**Start:** Wed 2024-05-22 10:00 AM  
**End:** Wed 2024-05-22 10:45 AM  
**Show Time As:** Tentative

**Recurrence:** (none)

**Meeting Status:** Not yet responded

**Organizer:** Saika Sarazin

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

-----Original Appointment-----

**From:** Saika Sarazin <Saika.Sarazin@invcanada.ca>

**Sent:** Friday, May 17, 2024 10:03 AM

**To:** Saika Sarazin; O'Keefe, Paul (ISED/ISDE; Nourallah, Laura (she, her | elle, la) (ISED/ISDE; White-Senack, Elizabeth (ISED/ISDE); Hoult, Colin; Yuen, Pui Wai; Fairchild, Jamie; Calvert, Tom; Jean-Benoit.LebLANC@international.gc.ca; Prosser, Kathleen; Manandhar, Sujata (she, her | elle, elle); Dutt, Amitabh; Temnikov, Dimitri; naina.thoppil@international.gc.ca; Tanya.Hinton (Tanya.Hinton@international.gc.ca); Kimberly.Rouleau@international.gc.ca; Mikhael, Marc -BIS; Thierry.Weissenburger@international.gc.ca; Guillaume.Boissy@international.gc.ca

**Cc:** Philippe Ferland; Dejan Velichkov; Tamaïka Jumelle

**Subject:** IIC/NRCAN/GAC/ISED - Post Federal Roundtable Discussion

**When:** May 22, 2024 10:00 AM-10:45 AM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Microsoft Teams Meeting

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Hello everyone,

Thank you, once again, for your time and participation for the Federal Roundtable on May 7<sup>th</sup>. We would like to coordinate another meeting to kickstart our deal team related to this file and discuss next steps.

Please let me know if this time and date work for your department.

Best regards,  
Saïka

**Saïka Sarazin**

Senior Advisor, Investor Services | Conseillère principale, services aux investisseurs

Invest in Canada | Investir au Canada

T 613 292-6817

160 Elgin St. | 160 rue Elgin



---

## Microsoft Teams [Need help?](#)

### Join the meeting now

Meeting ID: 256 721 968 047

Passcode: knoKnw

---

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[+1 647-497-6301](tel:+16474976301), [772217 083#](tel:+1772217083) Canada, Toronto

[Find a local number](#)

Phone conference ID: 772 217 083#

For organizers: [Meeting options](#) | [Reset dial-in PIN](#)

---

## Microsoft Teams [Besoin d'aide?](#)

### Joignez la réunion maintenant

ID de réunion : 256 721 968 047

Code secret : knoKnw

---

### Participez par téléphone

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[Trouvez un numéro local](#)

ID de conférence téléphonique : 772 217 083#

Pour les organisateurs : [Options de réunion](#) | [Réinitialiser le code NIP d'appel](#)

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## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** May 7, 2024 8:16 AM  
**To:** McAllister, Andrew  
**Subject:** FW: last week's discussion

Julian Amalraj M.Sc, P.Eng, PMP  
Senior Project Officer / Agent principal de projet Nuclear Processing Facilities Division / Division des installations de traitement nucleaires Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire / (613) 818-0515  
e-mail: Julian.Amalraj@cnscccsn.gc.ca

-----Original Message-----

From: Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>  
Sent: Monday, May 6, 2024 2:09 PM  
To: Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>  
Cc: Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>; Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>; Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>  
Subject: RE: last week's discussion

Hi Tessa,

Thanks so much for sharing the updated language. Looks great to us, and we'll be available to discuss as your work (and ours) proceeds. We'll also be sure to loop in the CNSC as appropriate regarding reprocess/enrichment related discussions. To this end, I'd suggested that CNSC be invited to a meeting tomorrow [REDACTED]  
[REDACTED] Pascale Bourassa was identified as the likely participant.

Best regards,

Jamie

(he/him/il/lui)

Senior Advisor | Conseiller principale

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs Telephone | Téléphone:  
343.543.6983

NEW: Jamie.Fairchild@NRCan-RNCan.gc.ca

-----Original Message-----

From: Henley, Tessa <tessa.henley@cnscccsn.gc.ca>  
Sent: Friday, May 3, 2024 9:09 AM  
To: Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>  
Cc: Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>; Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>; Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>  
Subject: RE: last week's discussion

Good morning Jamie,

Thanks for your questions/comments on the text for our deliverables. The language has been updated since we last spoke and has been included at the end of this email to ensure we're all on the same page.

We can confirm that the internal report from CNSC's work on reprocessing will be internal only (as specified in the updated list of expected deliverables). We have discussed classification at the Protected-B level but this is still to be confirmed when our workplan is presented for approval.

Once the internal report is finalized, we can share the contents, conclusions and any applicable recommendations to NRCAN/GAC to inform policy analysis and/or development. Depending on the circumstances at the time, we will share information either formally or informally.

Based on our current resource commitments, our priority is on reprocessing. We expect to keep our work on enrichment on hold at least till Aug-Sep, 2024 unless something changes on that front. Should something change, we would most appreciate if NRCAN could keep us informed and provide us with as much advanced notice as possible.

Please let us know if you have any other questions or comments.

Best,  
Tessa

\*\*\*

Expected Deliverables:

The purpose of this objective is to ensure CNSC readiness to address and regulate fuel reprocessing should it arise. The following shall be considered in scope:

1. Develop a high-level workplan that includes project milestones/timelines.
2. Support policy analysis and/or development on fuel reprocessing in Canada, in collaboration with federal partners.
3. Review CNSC's current requirements and guidance on reprocessing of spent nuclear fuel for use in Small Modular Reactors (SMR). Ensure alignment with #2.
4. Review CNSC staff's current capabilities in conducting reviews of licenses seeking authorization for the production and/or use of reprocessed nuclear fuel; and determine if improvements to regulatory framework, operating experience, training, and guidance on technical assessments is required.
5. Develop and publish an internal report which documents the analysis (based on #3 & #4), identifies all items which require further development and provides recommendations. Leverage existing CNSC processes, as required, to perform the analysis and issue the required information.
6. Ensure CNSC readiness to regulate fuel reprocessing by initiating Implementation of the identified recommendations into existing CNSC managed process. This is considered complete when the recommendations are entered into a managed process.

-----Original Message-----

From: Fairchild, Jamie <jamie.fairchild@NRCAN-RNCan.gc.ca>

Sent: Thursday, April 25, 2024 12:45 PM

To: Brunarski, Lee <Lee.Brunarski@cnsccsn.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCAN-RNCan.gc.ca>

Cc: Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>; Henley, Tessa <tessa.henley@cnsccsn.gc.ca>; Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>  
Subject: RE: last week's discussion

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

## Hautfenne-Jewer, Celia

---

**From:** Prosser, Kathleen  
**Sent:** June 7, 2024 3:49 PM  
**To:** McAllister, Andrew  
**Subject:** FW: Meeting with Project Yellow

Hi Andrew –

I didn't see your name on the list, sharing in case you'd like to attend.

Kate

---

Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

---

---

**From:** Saika Sarazin <Saika.Sarazin@invcanada.ca>  
**Sent:** Friday, June 7, 2024 1:30 PM  
**To:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Calvert, Tom <tom.calvert@NRCan-RNCan.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Dutt, Amitabh <amitabh.dutt@nrcan-rncan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>; naina.thoppil@international.gc.ca; Tanya.Hinton (Tanya.Hinton@international.gc.ca) <Tanya.Hinton@international.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Gratton, Wayne <wayne.gratton@cnscccsn.gc.ca>; Jason.Kenney@NRCan-RNCan.gc.ca; Tremblay, Philippe <Philippe.Tremblay@NRCan-RNCan.gc.ca>; Bourassa, Pascale <Pascale.Bourassa@cnscccsn.gc.ca>; Hoult, Colin <colin.hoult@nrcan-rncan.gc.ca>; Manandhar, Sujata (she, her | elle, elle) <sujata.manandhar@nrcan-rncan.gc.ca>  
**Cc:** Tamaïka Jumelle <Tamaïka.Jumelle@invcanada.ca>; Philippe Ferland <philippe.ferland@invcanada.ca>; Dejan Velichkov <Dejan.Velichkov@invcanada.ca>  
**Subject:** Meeting with Project Yellow

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Hello team,

As discussed during the Deal Team this week, the Company wanted to have a follow-up discussion with you to discuss next steps.

They have suggested meeting in person or through a TEAMS meeting for the dates of June 20 and June 21<sup>st</sup>. Can you please share your department preference in terms of date and location (virtual or in-person)?

Thank you,  
Saïka

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**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** August 27, 2024 12:36 PM  
**To:** Vary, Beth; Duchesne, Daniel  
**Cc:** Munezero, Gretta; McAllister, Andrew; Laroy, Marie  
**Subject:** FW: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Attachments:** #7257298-Moltex\_WATSS\_Service\_Agreement\_(Working\_Draft).DOCX.DRF

**Importance:** High

Hi Dan/ Beth,

As indicated below, we are ready to initiate the signatures for the service agreement with Moltex.

Can you please advise what is the process to be followed and who would need to sign this before the New President signs.

- From DNCFR, Andrew and Luc would need to review / sign the “docket”.
- We would need legal to sign as well?
- Also would Sarah or Beth be signing the “docket” as well.

Please advise,

I will initiate this through our admin once I hear back from you.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** Amalraj, Julian  
**Sent:** Tuesday, August 27, 2024 12:29 PM  
**To:** [REDACTED] <[REDACTED]>  
**Cc:** [REDACTED] McAllister, Andrew <andrew.mcallister@cnsccsn.gc.ca>; Vary, Beth <beth.vary@cnsccsn.gc.ca>; Duchesne, Daniel <daniel.duchesne@cnsccsn.gc.ca>; Sigouin, Luc <luc.sigouin@cnsccsn.gc.ca>  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Importance:** High

Dear [REDACTED]

Thank you for the response.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From** [REDACTED] <[\[REDACTED\]@moltexenergy.com](mailto:[REDACTED]@moltexenergy.com)>

**Sent:** Tuesday, August 27, 2024 10:13 AM

**To:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>

**Cc:** [REDACTED]

**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hello Julian,

We are happy with this final version and are good to execute. Please let us know when there is a version ready to sign.

We have discussed this at a high level before but we wanted to ensure full transparency with our schedule and plans to ensure expectations are aligned.

We will be focusing on WATSS Stage 1 tests at CNL for the remainder of 2024 and then fundraising and establishing a new commercial framework during the first half of 2025. From mid 2025 to end 2026 we will be completing primary R&D and conceptual engineering for WATSS. Much of this is done but cannot be complete until all primary R&D is done.

Once this agreement is signed we would like to engage with IAEA through 2025 to ensure we are incorporating Safeguards by Design and best practises into the design. We would like to do this at minimal cost, hopefully under the MSSP. We would then be engaging with CNSC more heavily with deliverables through 2026. We propose to agree schedules for this around Q2 next year.

[REDACTED]

[oliviergregoire@moltexenergy.com](mailto:oliviergregoire@moltexenergy.com)



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Sent:** Monday, August 26, 2024 10:05 AM  
**To:** [REDACTED]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Hi [REDACTED]

Following up on this. Do you have an update on when we can expect a response from Moltex on this draft SA.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** Amalraj, Julian  
**Sent:** Friday, August 16, 2024 1:36 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED]; McAllister, Andrew <[andrew.mcallister@cnscccsn.gc.ca](mailto:andrew.mcallister@cnscccsn.gc.ca)>; Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)>; Duchesne, Daniel <[daniel.duchesne@cnscccsn.gc.ca](mailto:daniel.duchesne@cnscccsn.gc.ca)>  
**Subject:** Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Importance:** High

Dear [REDACTED]

As advised earlier, CNSC staff have completed a legal review of the draft Moltex -CNSC service agreement towards review of the WATSS facility. Please find attached herewith the updated draft of the agreement for your perusal.

The key Changes in the document include:

- moving the clauses related to intellectual property into a dedicated section in the main body of the agreement;
- and simplifying the guidelines related to confidential information (Appendix B).

We have done this based on comments from CNSC staff's legal review and subsequently comparing several recent service agreements to ensure consistency and clarity. With this, CNSC staff are ready to initiate signatures of the agreement once you advise Moltex is ready to go forward on this.

As noted earlier, this agreement will be signed by the new President of the CNSC , Mr. Pierre Tremblay. I will be initiating this, as soon as I hear back from you on Moltex's readiness to go forward with this agreement.

Sincerely,


Julian


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** September 5, 2024 10:04 AM  
**To:** Sigouin, Luc; Amalraj, Julian  
**Subject:** FW: news: Orano enrichment in US

Fyi – we’ll see how this resonates within NRCAN and the work on the enrichment and reprocessing side of things.

Andrew

---

**From:** Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Sent:** Thursday, September 5, 2024 9:52 AM  
**To:** Bourassa, Pascale <Pascale.Bourassa@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>  
**Cc:** Reinholz, David <David.Reinholz@cnscccsn.gc.ca>  
**Subject:** FW: news: Orano enrichment in US

FYI – [REDACTED]

Kate

---

Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

---

---

**From:** Temnikov, Dimitri <dimitri.temnikov@NRCAN-RNCan.gc.ca>  
**Sent:** Thursday, September 5, 2024 9:45 AM  
**To:** Saika.Sarazin@invcanada.ca; Tanya.Hinton@international.gc.ca; Nourallah, Laura (ISED/ISDE) <Laura.Nourallah@ISED-ISDE.GC.CA>; thierry.weissenburger@international.gc.ca; John.Barnwell (John.Barnwell@international.gc.ca) <John.Barnwell@international.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Cc:** Dutt, Amitabh <amitabh.dutt@nrcan-rncan.gc.ca>; Yuen, Pui Wai <puiwai.yuen@NRCAN-RNCan.gc.ca>  
**Subject:** news: Orano enrichment in US

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

UNCLASSIFIED - NON CLASSIFIÉ

Good morning everyone,

I am sure you have seen the news:

[Orano to Build Multi-Billion Dollar Uranium Enrichment Plant in Tennessee | the deep dive](#)

“French nuclear fuel company **Orano** has announced plans to construct a state-of-the-art uranium enrichment facility in Oak Ridge, Tennessee. The project, valued at several billion dollars, aims to bolster US energy independence and reduce reliance on Russian uranium supplies. ... Orano plans to produce low-enriched

uranium up to 5% U235, with some production reaching 8%. The company will source uranium from US and international suppliers, including Canada.”

Cheers,  
Dimitri

■ Dimitri Temnikov

(343) 574-5378  
Policy Analyst  
Uranium and Radioactive Waste Division  
Natural Resources Canada

---  
Analyste des politiques  
Division de l'uranium et des déchets radioactifs  
Ressources naturelles Canada

Feel free to respond to this email in the official language of your choice.  
Sentez-vous à l'aise de me répondre dans la langue officielle de votre choix.

**Hautfenne-Jewer, Celia**

---

**From:** Prosser, Kathleen  
**Sent:** May 8, 2024 3:10 PM  
**To:** Bourassa, Pascale; Moroz, David; McAllister, Andrew  
**Cc:** Reinholz, David; Mecke, Julie  
**Subject:** FW: Orano deck  
**Attachments:** Orano Enrichment Final.pdf

Hi folks,

I requested the materials from yesterday's discussion, please see attached for the deck that [REDACTED] presented.

Cheers,

Kate

---

Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

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**Pages 4026 to / à 4039  
are withheld pursuant to section  
sont retenues en vertu de l'article**

**20(1)(b)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** July 19, 2024 8:01 AM  
**To:** McAllister, Andrew  
**Subject:** FW: Reprocessing and Enrichment Working Groups  
**Attachments:** ENRICHMENT WORKING GROUP TIMELINE.pdf; 1973 Statement of Uranium Enrichment.pdf; Reprocessing WG List.pdf; Enrichment WG List.pdf

FYI


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>

**Sent:** Wednesday, July 17, 2024 4:49 PM

**To:** Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; Kim,Duck (ECCC) <duck.kim@ec.gc.ca>; jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; Elizabeth.White-Senack@ised-isde.gc.ca; Nourallah, Laura (ISED/ISDE) <laura.nourallah@ised-isde.gc.ca>; Reinholz, David <David.Reinholz@cnsccsn.gc.ca>; Kent, Michael <Michael.Kent@cnsccsn.gc.ca>; Henley, Tessa <tessa.henley@cnsccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; Dalzell, Matthew (PrairiesCan) <matthew.dalzell2@prairiescan.gc.ca>; Ballantyne, Anne (PrairiesCan) <anne.ballantyne@prairiescan.gc.ca>; Rosaasen, Canute (PrairiesCan) <Canute.Rosaasen@prairiescan.gc.ca>

**Cc:** Gilbeau, Amanda <amanda.gilbeau@nrca-rnca.gc.ca>; Hoult, Colin <colin.hoult@nrca-rnca.gc.ca>; Wilkinson, David (he, him | il, lui) <david.wilkinson@NRCan-RNCan.gc.ca>; Cox, Jenny <jenny.cox@nrca-rnca.gc.ca>; Edwards, Geoff <Geoff.Edwards@nrca-rnca.gc.ca>; Anderson, Emma (she, her | elle, la) <Emma.Anderson@nrca-rnca.gc.ca>; Goulding, Liam <liam.goulding@nrca-rnca.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>; Wittmann, Tess (she, her | elle, elle) <tess.wittmann@nrca-rnca.gc.ca>; Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>; Rector, Brianna (she, her | elle, la) <brianna.rector@nrca-rnca.gc.ca>

**Subject:** Reprocessing and Enrichment Working Groups

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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PROTECTED A - PROTÉGÉ A

Dear Colleagues,

Thank you again for your support and flexibility as we determine the next steps for the reprocessing working group. While there is desire to continue with analyzing reprocessing, enrichment has increased in priority. As such, and given that many of the members of the working groups would be the same, for efficiency purposes,

we are proposing going forward with **two working groups**: one on reprocessing and one on enrichment (with a priority on enrichment).

Attached to this email are two sets of criteria for both working groups, and a timeline for the enrichment working group. For enrichment, our objective will be to assess the various criteria in relation to the 1973 enrichment statement by the Minister of Energy, Mines and Resources, Donald S. Macdonald (also attached for reference). We welcome any comments on either set of **criteria and confirmation of your organization's roles and key contacts** by Wednesday, July 24, 2024. We understand that there may be differences in staff representation for the two working groups if you could please indicate.

Once confirmed, NRCan will distribute the templates to populate for the various criteria. The leads of each criteria may wish to convene a meeting with the supporting organizations to coordinate analysis. We (NRCan) will soon also convene the first meetings for the criteria that we are leading (i.e. Technology Summary, Supply and Demand for Enriched Fuels/Materials, Economic Benefits and Costs, Energy Security and Industrial Development, International and Regional Relations on Enrichment, and Indigenous and Host Community Considerations).

We will send a calendar invite to the broad working group in the second half of August to reconvene and share updates. At the moment, we are not providing a timeline for the reprocessing working group and would like to further discuss this with you based on your organization capacity at the August meeting and the potential synergies between the two groups.

Thank you again for your expertise and collaboration. We look forward to working with you. Please forward to anyone in your organization who will be supporting this initiative that we may have missed.

Kind regards,  
Pui Wai Yuen

Pui Wai Yuen  
Director | Directrice  
Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs  
Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures  
Natural Resources Canada | Ressources naturelles Canada  
[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)  
Tel: 613-218-5067

**ENRICHMENT WORKING GROUP TIMELINE**

<b>Current Planned Work</b>			
<b>Scoping + Plan (complete)</b>	<b>Initial Work (July – August 2024)</b>	<b>Analysis (August – September 2024)</b>	<b>Final Version (October 2024)</b>
<ul style="list-style-type: none"> <li>• Scoping of analysis</li> <li>• Identification of key internal partners</li> <li>• Establish governance plan</li> </ul>	<ul style="list-style-type: none"> <li>• Identify criteria set out in scoping exercise</li> <li>• Develop paper(s) to guide internal and intra governmental consultations</li> <li>• Establish partner OGD and organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake detailed analysis of criteria</li> <li>• Circulate documents to key government departments and organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Complete series of internal discussion papers</li> </ul>

<b>Outcomes and Objectives</b>
<p><b>Decision Point</b>  <u>Work products at this stage:</u>                      Obtain consensus among OGDs                      Series of internal discussion papers with analysis of each of the criteria that would help assess against the 1973 enrichment policy and an executive summary</p> <p><u>Next Steps:</u>                      Touch base with central agencies, for e.g. PCO</p>

<b>Possible post-decision point steps (not currently planned)</b>
Engagement
Dispositioning
Final Analysis

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** July 24, 2024 11:45 AM  
**To:** Amalraj, Julian; Tran, Nhan  
**Subject:** FW: Reprocessing and Enrichment Working Groups

Hi there,

FYI.

Question: has there been discussions amongst the other CNSC reps on the reprocessing WG regarding representation on the enrichment WG?

I recall IGAD replying back to NRCAN when the last call for reps for the reprocessing WG went out.

You can use the email below to notify IGAD or I can reach out to them.

Let me know what works best for you.

Andrew

---

**From:** Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>  
**Sent:** Wednesday, July 24, 2024 11:40 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** RE: Reprocessing and Enrichment Working Groups

Good decision. I support. Thanks for keeping me in the loop.

Luc

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** Wednesday, July 24, 2024 11:34 AM  
**To:** Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

Hi Luc,

To build on our conversation we had last week, NRCAN is planning to focus more on enrichment and wants to establish a working group. Julian is the DNCFR rep (there are others from the CNSC) on the NRCAN reprocessing WG.

With Nhan taking over as the lead on the SMR Readiness objective on enrichment, it makes sense for him to be DNCFR's rep on this NRCAN working group as well. This will ensure alignment between the two. Julian would be his back up.

Julian and Nhan have discussed this but I wanted to get your confirmation that you are fine with this path forward.

Happy to discuss further as needed.

Cheers,

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>  
**Sent:** Friday, July 19, 2024 8:01 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnsccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

FYI

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire  
☎ (613) 818-0515  
✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>  
**Sent:** Wednesday, July 17, 2024 4:49 PM  
**To:** [Tanya.Hinton@international.gc.ca](mailto:Tanya.Hinton@international.gc.ca); [naina.thoppil@international.gc.ca](mailto:naina.thoppil@international.gc.ca); Kim,Duck (ECCC) <[duck.kim@ec.gc.ca](mailto:duck.kim@ec.gc.ca)>; [jennifer.mckay@ec.gc.ca](mailto:jennifer.mckay@ec.gc.ca); [catalin.obreja@ec.gc.ca](mailto:catalin.obreja@ec.gc.ca); [Elizabeth.White-Senack@ised-isde.gc.ca](mailto:Elizabeth.White-Senack@ised-isde.gc.ca); Nourallah, Laura (ISED/ISDE) <[laura.nourallah@ised-isde.gc.ca](mailto:laura.nourallah@ised-isde.gc.ca)>; Reinholz, David <[David.Reinholz@cnsccsn.gc.ca](mailto:David.Reinholz@cnsccsn.gc.ca)>; Kent, Michael <[Michael.Kent@cnsccsn.gc.ca](mailto:Michael.Kent@cnsccsn.gc.ca)>; Henley, Tessa <[tessa.henley@cnsccsn.gc.ca](mailto:tessa.henley@cnsccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>; [marc.desrosiers@hc-sc.gc.ca](mailto:marc.desrosiers@hc-sc.gc.ca); [Daniel.Daigle@tc.gc.ca](mailto:Daniel.Daigle@tc.gc.ca); Dalzell, Matthew (PrairiesCan) <[matthew.dalzell2@prairiescan.gc.ca](mailto:matthew.dalzell2@prairiescan.gc.ca)>; Ballantyne, Anne (PrairiesCan) <[anne.ballantyne@prairiescan.gc.ca](mailto:anne.ballantyne@prairiescan.gc.ca)>; Rosaasen, Canute (PrairiesCan) <[Canute.Rosaasen@prairiescan.gc.ca](mailto:Canute.Rosaasen@prairiescan.gc.ca)>  
**Cc:** Gilbeau, Amanda <[amanda.gilbeau@nrca-nrcan.gc.ca](mailto:amanda.gilbeau@nrca-nrcan.gc.ca)>; Hault, Colin <[colin.hault@nrca-nrcan.gc.ca](mailto:colin.hault@nrca-nrcan.gc.ca)>; Wilkinson, David (he, him | il, lui) <[david.wilkinson@NRCan-RNCan.gc.ca](mailto:david.wilkinson@NRCan-RNCan.gc.ca)>; Cox, Jenny <[jenny.cox@nrca-nrcan.gc.ca](mailto:jenny.cox@nrca-nrcan.gc.ca)>; Edwards, Geoff <[Geoff.Edwards@nrca-nrcan.gc.ca](mailto:Geoff.Edwards@nrca-nrcan.gc.ca)>; Anderson, Emma (she, her | elle, la) <[Emma.Anderson@nrca-nrcan.gc.ca](mailto:Emma.Anderson@nrca-nrcan.gc.ca)>; Goulding, Liam <[liam.goulding@nrca-nrcan.gc.ca](mailto:liam.goulding@nrca-nrcan.gc.ca)>; Fairchild, Jamie <[jamie.fairchild@NRCan-RNCan.gc.ca](mailto:jamie.fairchild@NRCan-RNCan.gc.ca)>; Temnikov, Dimitri <[dimitri.temnikov@NRCan-RNCan.gc.ca](mailto:dimitri.temnikov@NRCan-RNCan.gc.ca)>; Wittmann, Tess (she, her | elle, elle) <[tess.wittmann@nrca-nrcan.gc.ca](mailto:tess.wittmann@nrca-nrcan.gc.ca)>; Poupore, Jessica <[Jessica.Poupore@NRCan-RNCan.gc.ca](mailto:Jessica.Poupore@NRCan-RNCan.gc.ca)>; Rector, Brianna (she, her | elle, la) <[brianna.rector@nrca-nrcan.gc.ca](mailto:brianna.rector@nrca-nrcan.gc.ca)>  
**Subject:** Reprocessing and Enrichment Working Groups

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

PROTECTED A - PROTÉGÉ A

Dear Colleagues,

Thank you again for your support and flexibility as we determine the next steps for the reprocessing working group. [REDACTED]

Attached to this email are two sets of criteria for both working groups, and a timeline for the enrichment working group. For enrichment, our objective will be to assess the various criteria in relation to the 1973 enrichment statement by the Minister of Energy, Mines and Resources, Donald S. Macdonald (also attached for reference). We welcome any comments on either set of **criteria and confirmation of your organization's roles and key contacts by Wednesday, July 24, 2024**. We understand that there may be differences in staff representation for the two working groups if you could please indicate.

Once confirmed, NRCan will distribute the templates to populate for the various criteria. The leads of each criteria may wish to convene a meeting with the supporting organizations to coordinate analysis. We (NRCan) will soon also convene the first meetings for the criteria that we are leading (i.e. Technology Summary, Supply and Demand for Enriched Fuels/Materials, Economic Benefits and Costs, Energy Security and Industrial Development, International and Regional Relations on Enrichment, and Indigenous and Host Community Considerations).

We will send a calendar invite to the broad working group in the second half of August to reconvene and share updates. At the moment, [REDACTED] and would like to further discuss this with you based on your organization capacity at the August meeting and the potential synergies between the two groups.

Thank you again for your expertise and collaboration. We look forward to working with you. Please forward to anyone in your organization who will be supporting this initiative that we may have missed.

Kind regards,  
Pui Wai Yuen

Pui Wai Yuen  
Director | Directrice  
Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs  
Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures  
Natural Resources Canada | Ressources naturelles Canada  
[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)  
Tel: 613-218-5067

**Pages 4046 to / à 4047  
are withheld pursuant to section  
sont retenues en vertu de l'article**

**15(1)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

**Hautfenne-Jewer, Celia**

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**From:** Amalraj, Julian  
**Sent:** January 8, 2025 9:45 AM  
**To:** Duchesne, Daniel; Belyea, Sean  
**Cc:** Vary, Beth; McAllister, Andrew  
**Subject:** FW: Way forward

Hi Dan / Sean,



Julian

---

**From:** [Redacted]  
**Sent:** January 8, 2025 9:31 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** [Redacted]; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>  
**Subject:** RE: Way forward

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EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Thanks Julian, and happy New Year as well.



[oliviergregoire@moltexenergy.com](mailto:oliviergregoire@moltexenergy.com)



Moltex Energy  
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---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** January 8, 2025 9:41 AM

**To:** [REDACTED] >  
**Cc:** [REDACTED] Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>  
**Subject:** RE: Way forward  
**Importance:** High

Good Morning [REDACTED]

Happy New Year as well. Hope you are doing good.

CNSC staff took an action from our meeting on December 2<sup>nd</sup>, 2024 to clarify with the IAEA on the status of including the WATSS reprocessing facility under the MPSS process.

To this effect, CNSC staff have discussed this matter with the IAEA and the IAEA's response is that they would like to include the WATSS in the task of SBD for SMRs.

Looking to see if we can close the loop on this and setup what our review plan would look like to ensure we have proper resources allocated. I am proposing that we have another meeting in the week of January 20<sup>th</sup> onwards to discuss how to proceed.

Please advise.

Regards,

Julian Amalraj

---

**From:** [REDACTED] >  
**Sent:** November 22, 2024 1:12 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** [REDACTED] Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Subject:** RE: Way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hi Julian,

Yes this would be suitable, thanks





Moltex Energy  
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+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** November 22, 2024 11:26 AM

**To:** [Redacted]  
**Cc:** [Redacted], Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Prosser, Kathleen <[kathleen.prosser@cnscccsn.gc.ca](mailto:kathleen.prosser@cnscccsn.gc.ca)>

**Subject:** RE: Way forward

H [Redacted]

Proposing that we meet Monday December 2<sup>nd</sup> (1 -2 pm) for this purpose based on CNSC staff personnel calendars.

Please advise if this works for Moltex.

Julian

---

**From:** [Redacted]  
**Sent:** November 18, 2024 3:19 PM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [Redacted], Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>  
**Subject:** RE: Way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

Sorry for my late reply.

I agree that this kind of meeting with the proposed attendees should be the next step. On our side, the first half of the first week of December (Dec 2 – 4) would be suitable. Our availabilities would be far more limited until then.

Thanks





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200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** November 13, 2024 12:11 PM

**To:** [REDACTED]  
**Cc:** [REDACTED] Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>

**Subject:** RE: Way forward

Hi [REDACTED]

Yes, I can confirm the agreement is in place. As a start, would it be possible to have a meeting first with Moltex and CNSC staff to get clarity on what the current status is with regard to this issue (MSSP) and what is needed moving forward. This will also allow CNSC staff to understand better what we need to do to initiate these conversations with the IAEA.

I would propose our safeguards staff dealing with this issue and possibly one non-proliferation expert in this meeting so that we have the respective personnel up to date and agreement on what is needed as next steps.

Please advise and I will setup a meeting that is suitable for everybody,

Julian

---

**From:** [REDACTED]  
**Sent:** November 7, 2024 10:53 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [REDACTED]  
**Subject:** Way forward

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

Now that the agreement is in place, I guess that the process to broaden the MSSP to include WATSS should be cleared of any roadblocks. Do you have an idea of the current status? Should we have some coordination on the way forward?

Thanks





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+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** [Redacted]  
**Sent:** October 31, 2024 10:01 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [Redacted]  
**Subject:** FW: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Hi Julian.

Here is the signed document.



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** [Redacted]  
**Sent:** [Redacted]  
**To:** [Redacted]  
**Subject:** RE: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Signed, same [Redacted]

---

**From:** [Redacted]  
**Sent:** October 21, 2024 10:10 AM  
**To:** [Redacted]  
**Subject:** FW: For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Hi [Redacted]

Here is the Agreement to sign.

I'll send you the password by text message.





Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Munezero, Gretta <[gretta.munezero@cnsccsn.gc.ca](mailto:gretta.munezero@cnsccsn.gc.ca)>  
**Sent:** October 18, 2024 10:28 AM  
**To:** [Redacted]  
**Cc:** McAllister, Andrew <[Andrew.McAllister@cnsccsn.gc.ca](mailto:Andrew.McAllister@cnsccsn.gc.ca)>; Sigouin, Luc <[Luc.Sigouin@cnsccsn.gc.ca](mailto:Luc.Sigouin@cnsccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>  
**Subject:** For your approval - Signed Service Agreement for consultation / review for the Waste to Stable Salt (WATSS) reprocessing facility

Good day,

On behalf of Julian Amalraj, please find attached the service agreement for the Moltex Energy Canada Inc's WATSS facility project approved by President Tremblay.

I will be sending the password to the service agreement document in a separate email.

Could you please return electronically a signed copy when convenient?

*Please note, no hard copies will follow.*

Regards,

***Gretta Munezero***

Administrative Assistant, Nuclear Processing Facilities Division  
Canadian Nuclear Safety Commission | Government of Canada  
Adjoint administratif, Division des installations de traitement Nucléaires  
Commission canadienne de sûreté nucléaire | Gouvernement du Canada

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**13(1)(b)**

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**20(1)(b), 21(1)(a)**


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## Meeting report – Informal meeting with IAEA Safeguard department

Meeting: In-person, Vienna, June 28<sup>th</sup> 2024



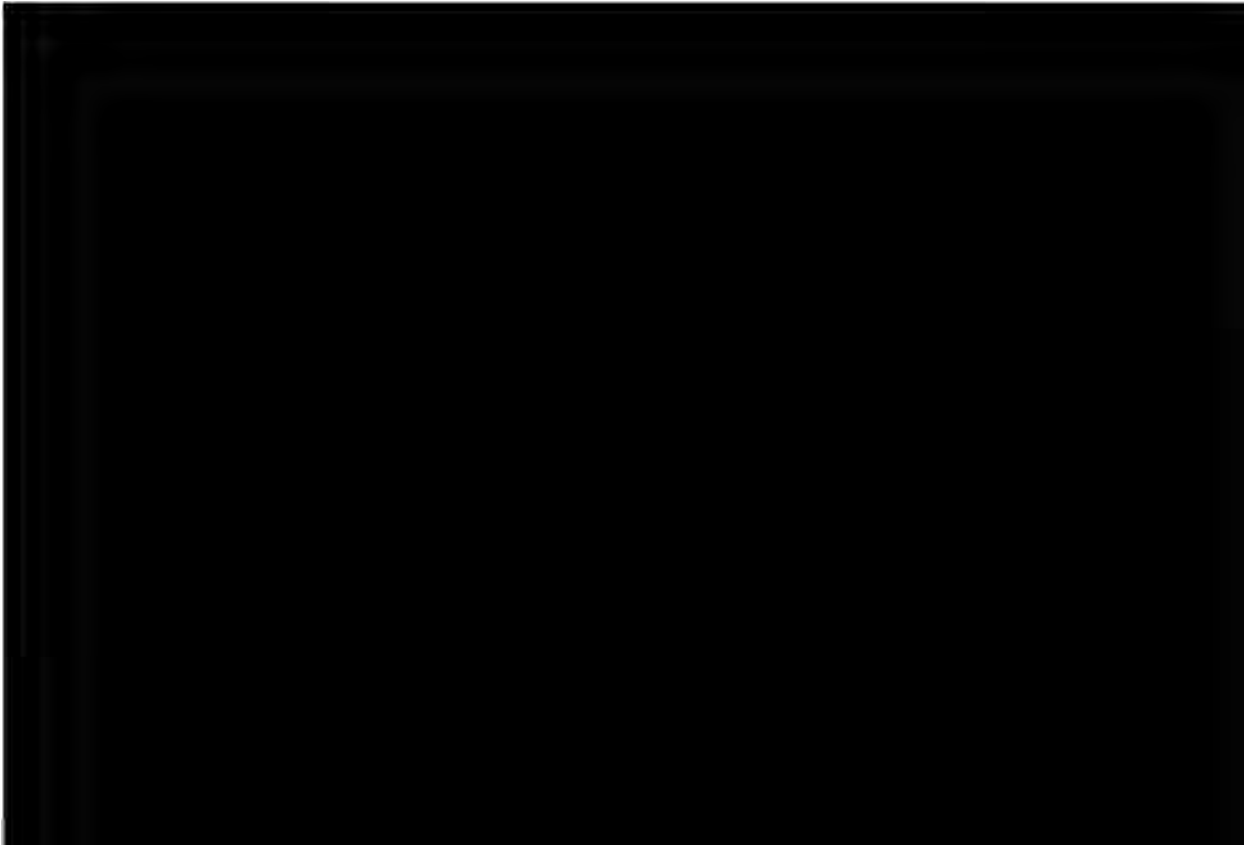
Objectives:

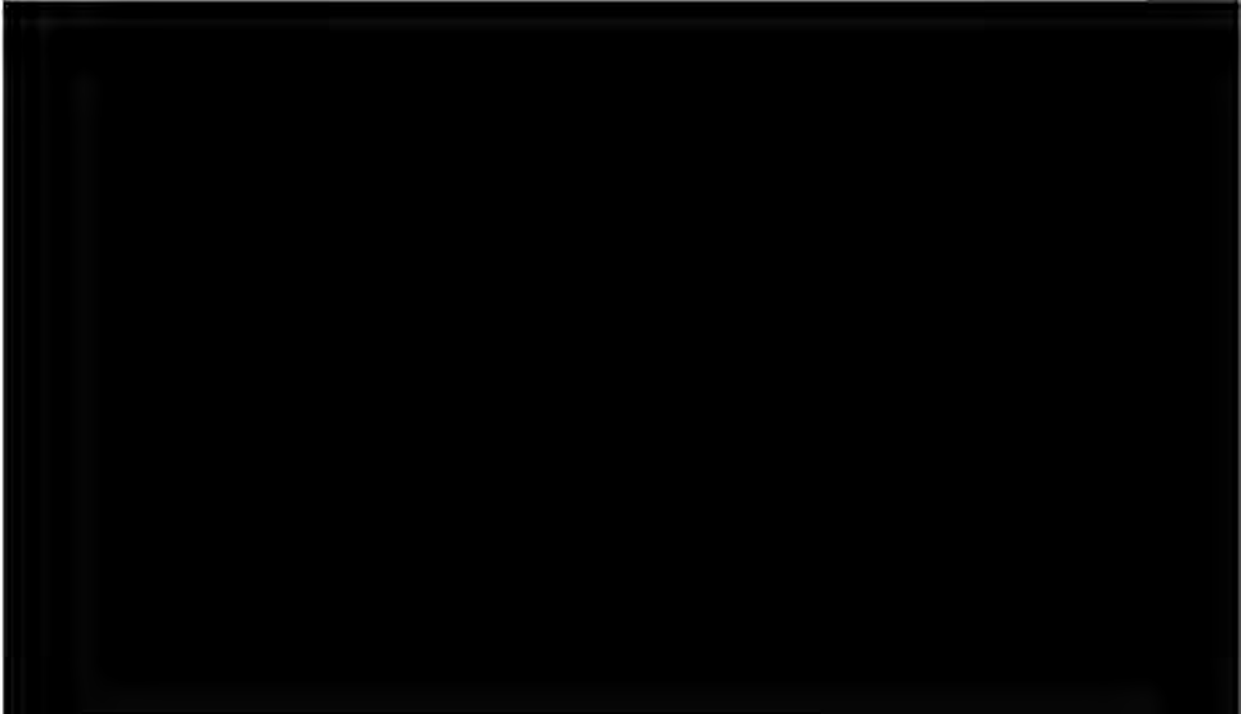
- 
- Assess suitability of current approach to Safeguards in design development.
- Estimate potential impact of WATSS on country profile of Canada / other licensees.

Outcomes:

General remarks on overall approach:

- Approach is seen as in-line with Safeguards-by-Design principles, considered as among the ‘Best practices’.





Further activities:

It is mutually understood that future engagement should include the CNSC, as soon as an agreement framework is signed, ideally by including WATSS in the MSSP framework.



## Hautfenne-Jewer, Celia

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**From:** Amalraj, Julian  
**Sent:** July 3, 2024 9:55 AM  
**To:** McAllister, Andrew; Posada, Lester  
**Cc:** Sigouin, Luc  
**Subject:** Notes from my attendance at the Workshop on Safety of Fuel Manufacturing for advanced reactors.

**Importance:** High

Hi Andrew,

Please see attached my notes from the **“Workshop on Safety of Fuel Manufacturing for Advance reactors”** that as conducted in Vienna, between June 24-27, 2024. There were some very interesting presentations and these provided excellent insight into the challenges of fuel supply to SMRs and advanced reactors. I came away with a very good idea of the key challenges.

My notes from the workshop follows;

- There were a total of 28 participants from several member states and both the Industry and regulators were represented adequately. From Canada the CNSC (myself) and Moltex (Olivier) participated.
- The workshop was opened with welcome address from Olena Mykolaichuk (Division of Nuclear Safety) & Anshelika Khaperskaia (Division of Nuclear Energy).
- Scientific Secretary for this meeting was Mr. Lakshman Valiveti who explained the purpose, scope and agenda for this meeting.
- The meeting participants elected Mr. Julian Amalraj (Canada) as the Chair of the meeting and Ms. Maria Olivera Munoz (Argentina) and Ms. Shafaq Azram (Pakistan) as the repertoires for this meeting.
- Several IAEA presentations were made during the workshop that dealt with
  - Regulatory Framework, safety standards and activities of the IAEA in support of fuel manufacturing for advanced reactors including SMRs.
  - SSG-42 and SSG-43 in works – no material on Pyro or MSR type fuels yet developed.
  - Does current standards applicable for the new fuel cycles to support advanced reactors.
    - TRISO & HALEU fuels
    - MSR fuel with open and closed cycle including reprocessing
    - Fuel for fast reactors.
  - Potential future work on chemical hazards / fire safety.
  - Potential work specific to types of fuel and opex related to them.
- The IAEA Working Group for Fuel Cycle Safety (WGFCs-IAEA) is expected to carry out key work on the technical and regulatory challenges discussed. The first meeting is planned for August 26-29 that will identify key topics to explore based on some of the recommendations from this meeting.
- The workshop also split into three working groups to review challenges to manufacturing and safety of specific fuel types:
- Group 1: HALEU / TRISO

- HALEU production / availability, US Vs German/South African approaches, Use of TCE and production scaling up, criticality safety and the validation of criticality codes (5-20%), transport of HALEU, emergency arrangements and chemo toxic issues for TRISO fuel manufacturing, Radiation protection implications for HALEU and TRISO manufacturing, quality assurance, waste management and material challenges.
  - No issues with enrichment
  - Concern on U232 and its progeny's presence on top of the usual U233 and U234 radiation protection concerns.
- Group 2: MSR fuel
    - Environmental assessment of Reprocessing facilities dealing with transuranics.
    - Fuel material behavior requires more understanding, processing conditions (like high temperatures, leaks, accident conditions, criticality) need more studies, requires safe infrastructure (fire protection, hot cells etc) , applicability of regulations, treatment of waste and disposal options and training and information exchange needs.
    - The Canadian proposed WATTS facility is unique even when compared to the typical reprocessing facilities and pyro processing approaches. In this regard the experiments at Chalk river will be very useful in assessing key claims and safety aspects – We will need to understand this better.
    - There are some research proposals and possible opex related to these facility processes ( Criticality behavior of Chloride fuels in accident conditions is worse than oxide fuels, Corrosivity of the processes and its maintenance requirements, criticality behavior of high temperature salts) – would be key areas for CNSC staff to explore in terms of technical readiness. The US DOE Idaho national laboratories (participants in this workshop) has very useful experimental results and opex related to this and it may be useful for CNSC staff to engage them to get training/exposure to this type of fuel processing being proposed in Canada.
  - Group 3: Fuel for Fast Reactor
    - Several types of fuel reviewed, fuel types other than UO<sub>2</sub> offer higher performance or greater fuel cycle versatility but also present new hazards and greater accident severity that must be considered. Some of them are also difficult to process with the same level of safety as UO<sub>2</sub>. . There is a table detailing advantages and challenges were also provided.

#### Key Recommendations:

- IAEA focus on developing more OPEX, data/publication on key aspects of fuel processing and fuel behavior outside a core (criticality, fire protection, material behavior, radiation protection, study of accident conditions and PIEs)
  - IAEA should consider a TECDOC to document a scan of the various technologies and approaches to fuel manufacturing with an aim to capture opex (eg. US vs German approaches, criticality control, fire protection and ventilation aspects)
  - Fuel quality and certification should be reviewed for these new fuels.
- More material/ opportunities on training and information exchange should be created.
  - Sustainability of these technologies and alignment with overall mandates.
  - More focus on safety is needed and a Prioritization of the challenges identified will help with closer review and help more scrutiny.
- Explore any gaps / regulatory readiness on regulation of these newer technologies in fuel processing.
  - Are there any open documentation available to share on activities related to regulatory readiness that can be shared.

If you have any questions, please feel free to reach out to me.

Julian


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*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

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**20(1)(b), 21(1)(b)**


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**Hautfenne-Jewer, Celia**

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**From:** Brunarski, Lee  
**Sent:** November 20, 2024 8:25 PM  
**To:** Reinholz, David; Kent, Michael; Amalraj, Julian; Prosser, Kathleen; Levine, Adam; Henley, Tessa  
**Cc:** Gratton, Wayne; McAllister, Andrew; Kanasewich, Elaine; Tran, Nhan  
**Subject:** RE: Kick-Off: Enrichment Working Group - Criteria 9

Hello.

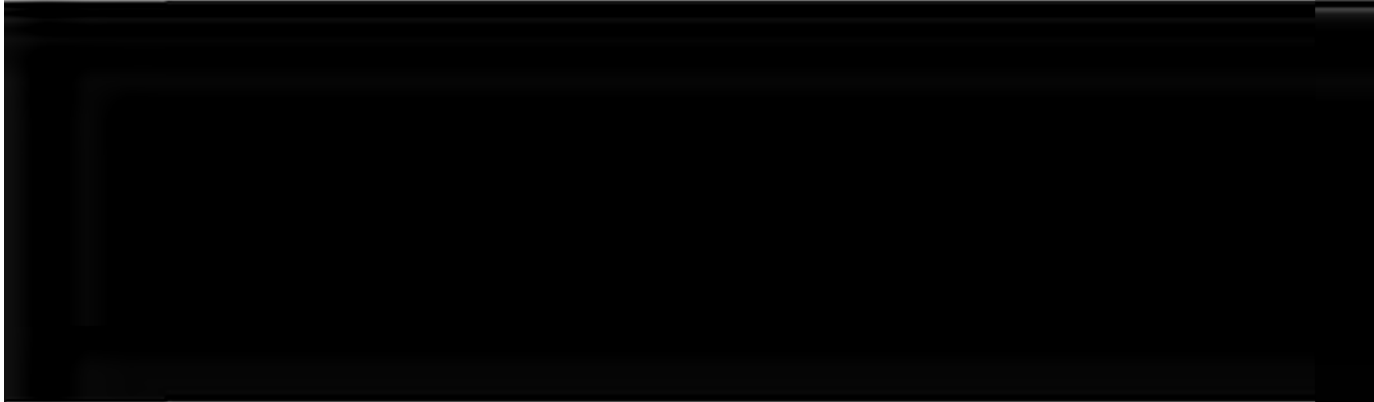
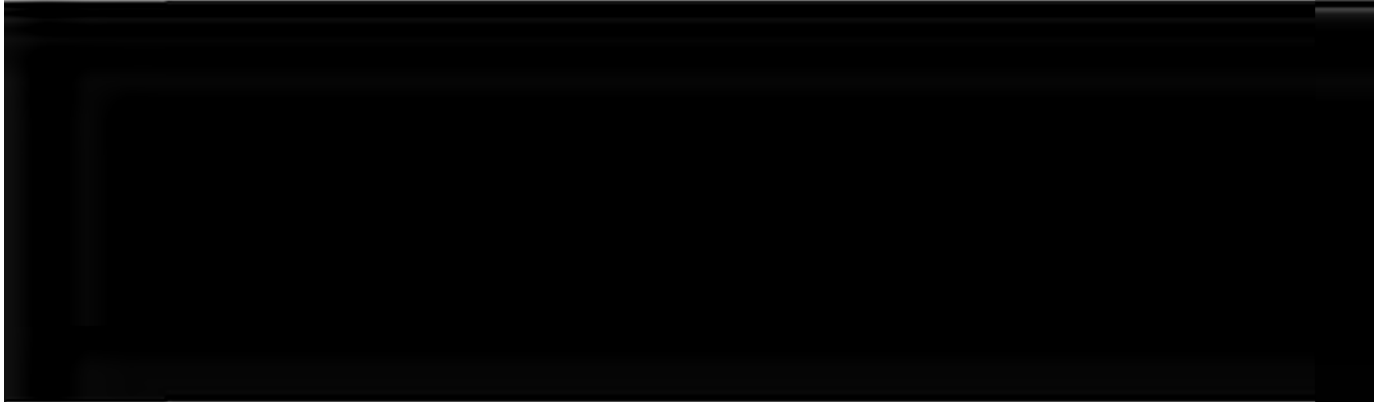
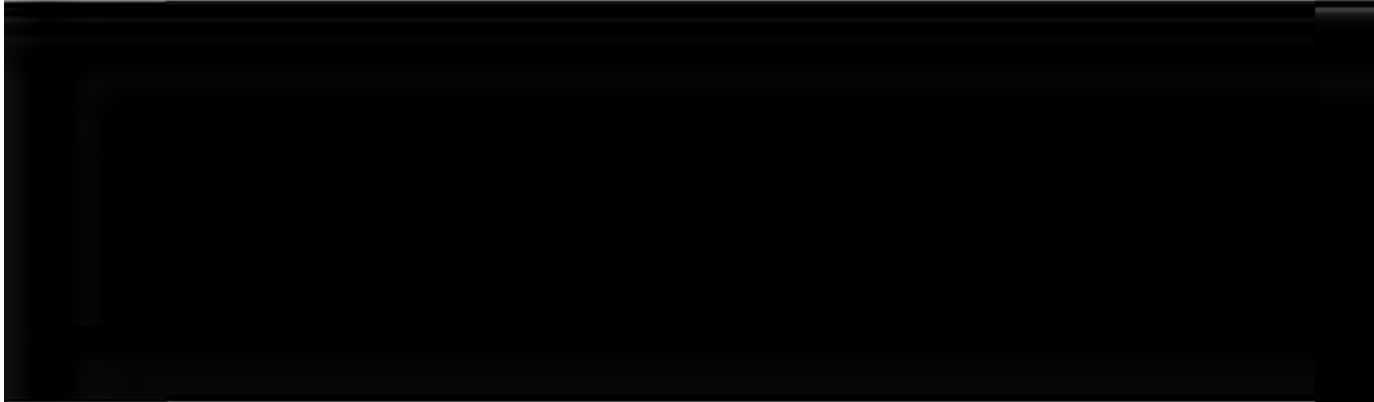
I attended this meeting “**Kick-Off: Enrichment Working Group – Criteria 9**” this afternoon. We are a “consulted” department, even though that was elided in the draft  9 - Indigenous and Host Community Considerations.NRCan Input.docx prepared by NRCan.

Through this email, I am checking in to confirm who else from the CNSC is a member, wants to be a member or should be a member.

**Adam**, I think someone from your team should participate, at least to review the drafts going forward. The timeline is as follows:

1 <sup>st</sup> draft of analysis	Jan. 7 <sup>th</sup> , 2025
Comments on 1 <sup>st</sup> draft	Jan. 21 <sup>st</sup>
2 <sup>nd</sup> draft	Feb. 4 <sup>th</sup>
Comments on 2 <sup>nd</sup> draft	Feb. 18 <sup>th</sup>
Final draft for Redlines	Mar. 4 <sup>th</sup>
Redlines submitted	Mar 18 <sup>th</sup>
NRCan Director-approved final version	Mar. 31 <sup>st</sup>

During the meeting, I noted/asked the following:

- 
- 
- 

Related, in addition to being consulted on Indigenous and Host Community Considerations criteria in both working groups, the CNSC has been identified as the lead or co-lead for the same 3 enrichment and reprocessing criteria in both working groups (**Environmental Effects + Waste, Domestic Regulatory Environment, and Non-Proliferation and Safeguarding, Import and Export Control Considerations**). That work hasn’t started yet but should soon, so

confirmation of who else from the CNSC is a member, who wants to be a member or who should be a member for these criteria would also be greatly appreciated.

All related criteria documents and member lists for the enrichment and working groups are found here [☐ Enrichment and Reprocessing Working Groups](#). The NRCAN GCdocs site is found here [Enrichment and Reprocessing Working Groups](#) (you need permission to access it). And the related emails with attachments are found in this [e-Access folder](#) as I couldn't figure out how to get the attachments to the emails to appear in SharePoint.

Glad to discuss.

Thanks very much!

Lee

-----Original Appointment-----

**From:** Goulding, Liam <liam.goulding@nrca-nrcan.gc.ca>

**Sent:** Tuesday, November 12, 2024 2:05 PM

**To:** Goulding, Liam; Temnikov, Dimitri; Kim,Duck (ECCC); jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; marc.desrosiers@hc-sc.gc.ca; Li,Anita (ECCC); Plant,Wesley (ECCC); Dalzell, Matthew (PrairiesCan); Ballantyne, Anne (PrairiesCan); Rosaasen, Canute (PrairiesCan); Reinholz, David; Kent, Michael; Brunarski, Lee; Amalraj, Julian; Kanasewich, Elaine; Prosser, Kathleen

**Subject:** Kick-Off: Enrichment Working Group - Criteria 9

**When:** November 20, 2024 2:00 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Microsoft Teams Meeting

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Good afternoon,

I hope everyone had a great long weekend!

I am reaching out regarding the Enrichment Working Group as NRCAN and ECCC are co-leads on Criteria 9 – Indigenous and Host Community Considerations. The most recent template with input is attached. Alternatively, please reference this link in our shared portal: [9 - Indigenous and Host Community Considerations](#). If you are having any access issues, just let me know.

As a next step, I have proposed the following time at 2:00 EST November 20<sup>th</sup> for a quick kick-off Meeting to have a brief discussion of the criteria and answer any questions you may have.

Thank you!

Liam Goulding

Policy Analyst | Analyste des politiques

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Natural Resources Canada | Ressources naturelles Canada

580 Booth St, 19th Floor | 580 rue Booth, 19e étage

Ottawa, Ontario, K1A 0E4

[liam.goulding@NRCan-RNCan.gc.ca](mailto:liam.goulding@NRCan-RNCan.gc.ca)

---

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Video ID: [REDACTED]

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ID vidéo: [REDACTED]

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**20(1)(b), 20(1)(c)**

**of the Access to Information Act  
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**13(1)(a), 13(1)(b), 21(1)(b)**

**of the Access to Information Act  
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**Hautfenne-Jewer, Celia**

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**From:** McAllister, Andrew  
**Sent:** February 20, 2025 8:25 AM  
**To:** Amalraj, Julian  
**Subject:** RE: Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

Hi there,

Makes sense – need to establish travel expectations early on – if Moltex wants in person ones to happen (regardless of location), they will need to pay (that is my opinion) – I don't know what if any travel budget exists under MSSP.

Please make sure that we land internally on a position and that the CNSC position gets communicated back to them. For example, it would be a hard sell in my opinion for our ISD colleagues to find money to go to Vienna for meetings on this matter within their existing budget unless it was piggy backed on another funded event.

Thanks

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** February 20, 2025 8:20 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** RE: Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

Hi Andrew,

Yes, we did budget one trip for two staff to NB Power.  
I will touch base with ISD and get back to [REDACTED] on this.

Julian

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** February 20, 2025 8:07 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** RE: Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

I seem to recall that we had allocated some travel budget under this Service Agreement – not sure if we allocated it to a specific year.

Anyhow, if they want CNSC staff in person, then that seems the logical spot to fund it from.

Andrew

---

**From:** [REDACTED]  
**Sent:** February 20, 2025 7:59 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca> [REDACTED]

**Cc:** Gao, Henry <[Henry.Gao@cnsccsn.gc.ca](mailto:Henry.Gao@cnsccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnsccsn.gc.ca](mailto:Andrew.McAllister@cnsccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnsccsn.gc.ca](mailto:Elaine.Kanasewich@cnsccsn.gc.ca)>; McKnight, Heather <[HMcknight@nbpower.com](mailto:HMcknight@nbpower.com)>

**Subject:** RE: Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

For the planning of the first round of meetings, as proposed below, I would like to add that if possible the week of May 5-9 should be avoided.

There is a highly relevant NEI event dedicated to used fuel management this week.

Thanks

Olivier



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---

**From** [Redacted]  
**Sent:** February 16, 2025 11:10 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)> [Redacted]  
**Cc:** Gao, Henry <[Henry.Gao@cnsccsn.gc.ca](mailto:Henry.Gao@cnsccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnsccsn.gc.ca](mailto:Andrew.McAllister@cnsccsn.gc.ca)>; Kanasewich, Elaine <[Elaine.Kanasewich@cnsccsn.gc.ca](mailto:Elaine.Kanasewich@cnsccsn.gc.ca)>; [hmcknight@nbpower.com](mailto:hmcknight@nbpower.com)  
**Subject:** RE: Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

Julian,

Following on the meeting in subject, Moltex proposes the following schedule for engagement with IAEA with CNSC as facilitator:



The type of information submitted and the timing will be consistent with the scope and schedule of the meetings as proposed above.

If this is suitable to you, could you coordinate with IAEA for a formal re-engagement under MSSP?

Thanks



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---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Sent:** January 30, 2025 11:27 AM  
**To:** [Redacted]  
**Cc:** Gao, Henry <[Henry.Gao@cnscccsn.gc.ca](mailto:Henry.Gao@cnscccsn.gc.ca)>, McAmster, Andrew <[Andrew.McAmster@cnscccsn.gc.ca](mailto:Andrew.McAmster@cnscccsn.gc.ca)>, Kanasewich, Elaine <[Elaine.Kanasewich@cnscccsn.gc.ca](mailto:Elaine.Kanasewich@cnscccsn.gc.ca)>  
**Subject:** Meeting highlights / actions from CNSC-Moltex meeting on Jan 30, 2025

Hello there,

Capturing some key points/highlights from our meeting today:

Attendees:

CNSC- Julian A, Henry G



NB Power (Observers) – Will H, Heather M, Kevin S, Paul T

Olivier, Please forward to NB Power personnel as you see fit.

Meeting Highlights:

On Safeguards:

- CNSC informed Moltex that activities under the MSSP is voluntary and it is up to Moltex to decide what they want to do. CNSC can be an observer or a facilitator. If Moltex wants CNSC as a facilitator, CNSC will support organizing the meetings with IAEA personnel and can submit information thru the member state portals which will be secure.
- CNSC staff can also do the technical reviews in support of the IAEA activity. Again, suggested it is for Moltex to decide what they want to do in this topical area.
- Moltex wants CNSC to act as facilitator (receive and transmit information to/from Moltex and IAEA and coordinate meetings) under the MSSP program. Moltex expects that this is outside of the service agreement and they will not incur any costs for this as per earlier discussion between Moltex and CNSC staff.

- Moltex does not foresee any other submissions this year but submissions to start in 2026 under the service agreement.

Moltex actions / activity going forward will be:

- Moltex will be submitting a plan request (# meetings, topics to be discussed and potential dates) to CNSC staff so that we may facilitate the discussions with IAEA. They will include general information so as to restart this conversation.
- Moltex will also submit a plan for information submission (topics/dates) to support the MSSP discussions with the IAEA.

On General Matters:

Moltex claims that they have completed proof of concept and have demonstrated viability of their reprocessing technology with CNL(Chalk River).

- o A press announcement and a research paper is expected from Moltex in the next few weeks on this.
- o As part of this announcement, Moltex also wants to inform publicly that they have signed a service agreement with CNSC and are working with the CNSC and the IAEA on the safeguards by design (MSSD?) program.
- Moltex will provide information to CNSC on their reprocessing technology as it has evolved to a mix of electrorefining and metal reduction/extraction process.
- Moltex wants CNSC to provide some pre-licensing support information / guidance on licensing process steps/timelines for the WATSS type of facility at a future date – details to be discussed.

Julian

**Hautfenne-Jewer, Celia**

---

**From:** Prosser, Kathleen  
**Sent:** June 18, 2024 9:26 AM  
**To:** McAllister, Andrew  
**Subject:** RE: Meeting with Project Yellow

Hi Andrew,

I haven't seen anything come in from Saika – I think folks were leaning towards the 20<sup>th</sup> for the meeting. I'll follow up with her today to see what progress has been made in getting it scheduled.

The focus of the meeting is intended to be [REDACTED]

Kate

---

Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

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---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** Tuesday, June 18, 2024 8:52 AM  
**To:** Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Subject:** RE: Meeting with Project Yellow

Good morning Kate.

I mistook this email for the Project Yellow mtg on Weds but in fact it is suppose to be with the proponent.

Has this materialized and will there be a CNSC presence at it?

Thanks

Andrew

---

**From:** Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Sent:** Friday, June 7, 2024 3:49 PM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** FW: Meeting with Project Yellow

Hi Andrew –

I didn't see your name on the list, sharing in case you'd like to attend.

Kate

---

Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

---

**From:** Saika Sarazin <Saika.Sarazin@invcanada.ca>

**Sent:** Friday, June 7, 2024 1:30 PM

**To:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Calvert, Tom <tom.calvert@NRCan-RNCan.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Dutt, Amitabh <amitabh.dutt@nrcan-rncan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>; naina.thoppil@international.gc.ca; Tanya.Hinton (Tanya.Hinton@international.gc.ca) <Tanya.Hinton@international.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Gratton, Wayne <wayne.gratton@cnscccsn.gc.ca>; Jason.Kenney@NRCan-RNCan.gc.ca; Tremblay, Philippe <Philippe.Tremblay@NRCan-RNCan.gc.ca>; Bourassa, Pascale <Pascale.Bourassa@cnscccsn.gc.ca>; Hoult, Colin <colin.hoult@nrcan-rncan.gc.ca>; Manandhar, Sujata (she, her | elle, elle) <sujata.manandhar@nrcan-rncan.gc.ca>  
**Cc:** Tamaika Jumelle <Tamaika.Jumelle@invcanada.ca>; Philippe Ferland <philippe.ferland@invcanada.ca>; Dejan Velichkov <Dejan.Velichkov@invcanada.ca>  
**Subject:** Meeting with Project Yellow

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello team,

As discussed during the Deal Team this week, the Company wanted to have a follow-up discussion with you to discuss next steps.

They have suggested meeting in person or through a TEAMS meeting for the dates of June 20 and June 21<sup>st</sup>. Can you please share your department preference in terms of date and location (virtual or in-person)?

Thank you,  
Saika

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**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** July 26, 2024 8:49 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED] Kent, Michael; Kanasewich, Elaine; Gao, Henry; McAllister, Andrew; Sigouin, Luc; Duchesne, Daniel; Vary, Beth  
**Subject:** RE: Member Support Program for WATSS

Hi [REDACTED]

Thank you for the update and the request.

CNSC staff are ready to initiate discussions and consultations with Moltex and the IAEA on what is needed to move forward with this request.

As you are aware, we are at present awaiting a legal review of the draft Service Agreement and we expect to send to Moltex an updated draft shortly based on this review. We will do our best to expedite the signing of this agreement so that we can start these discussions.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire  
☎ (613) 818-0515  
✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [REDACTED]  
**Sent:** Thursday, July 25, 2024 11:26 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [REDACTED]  
**Subject:** Member Support Program for WATSS

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Dear Julian,

As you may know we have been approved under the Member State Support Program for Safeguards review of the SSR-W with IAEA for several years.

As discussed with Olivier briefly recently, we would like to formally request that we be approved to review WATSS under the same program. Please advise if this is possible and if there is anything else we need to do.

Kind regards,



Moltex Energy

+1 506 214 8551 | [info@moltexenergy.com](mailto:info@moltexenergy.com) | [www.moltexenergy.com](http://www.moltexenergy.com)

**Disclaimer**

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** September 16, 2024 9:07 AM  
**To:** Vary, Beth  
**Cc:** McAllister, Andrew  
**Subject:** RE: Moltex special project  
**Attachments:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Hi Beth,

Thank you for your support on this. The signing is ongoing . . . I think we will get there early October. I will keep you posted if any changes. Please see some answers to your queries below "in red".

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

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Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
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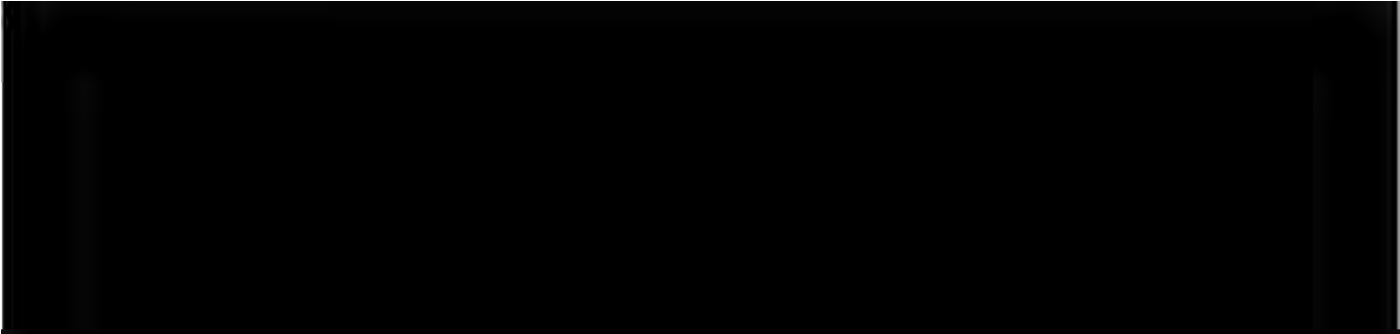
**From:** Vary, Beth <beth.vary@cnscccsn.gc.ca>  
**Sent:** Monday, September 16, 2024 8:37 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** Moltex special project

Good morning Julian,

I hope you had a nice summery weekend.

I wanted to connect about the WATSS/Moltex SA. I hope that I was not too "behind the scenes" in recent discussions. Dan and I were coordinating prior to him reaching out to share his knowledge about the SA signing process, but I was not directly part of the discussions as I haven't been through the process myself. I trust that it went well. It is not a process that many people have experience with.

Also, I am reaching out as I would like to confirm a few details about the project for the FYQ2 financial review this week. Would it be possible to confirm a few details about the project:

- 
- 
-

These questions above will help me to update CNSC's financial forecast for this fiscal year.

Thank you!

Beth

**Beth Vary** (she/her/elle)

Director, Advanced Reactor Assessment Division (ARAD)  
Canadian Nuclear Safety Commission / Government of Canada  
[beth.vary@cnsccsn.gc.ca](mailto:beth.vary@cnsccsn.gc.ca) / Tel: 343-553-6863

Directrice, Division de l'évaluation des réacteurs avancés (DERA)  
Commission canadienne de sûreté nucléaire / Gouvernement du Canada  
[beth.vary@cnsccsn.gc.ca](mailto:beth.vary@cnsccsn.gc.ca) / Tel: 343-553-6863

**Hautfenne-Jewer, Celia**

---

**From:** [REDACTED]  
**Sent:** [REDACTED]  
**To:** Amalraj, Julian  
**Cc:** [REDACTED]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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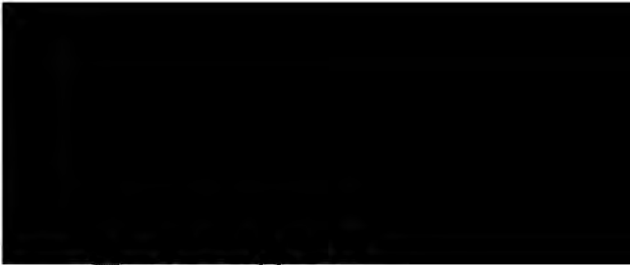
Hello Julian,

We are happy with this final version and are good to execute. Please let us know when there is a version ready to sign.

We have discussed this at a high level before but we wanted to ensure full transparency with our schedule and plans to ensure expectations are aligned.

We will be focusing on WATSS Stage 1 tests at CNL for the remainder of 2024 and then fundraising and establishing a new commercial framework during the first half of 2025. From mid 2025 to end 2026 we will be completing primary R&D and conceptual engineering for WATSS. Much of this is done but cannot be complete until all primary R&D is done.

Once this agreement is signed we would like to engage with IAEA through 2025 to ensure we are incorporating Safeguards by Design and best practises into the design. We would like to do this at minimal cost, hopefully under the MSSP. We would then be engaging with CNSC more heavily with deliverables through 2026. We propose to agree schedules for this around Q2 next year.



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+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>  
**Sent:** Monday, August 26, 2024 10:05 AM  
**To:** [REDACTED]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

H [REDACTED]

Following up on this. Do you have an update on when we can expect a response from Moltex on this draft SA.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

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Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

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✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** Amalraj, Julian

**Sent:** Friday, August 16, 2024 1:36 PM

**To:** [REDACTED] >

**Cc:** [REDACTED] McAllister, Andrew <[andrew.mcallister@cnsccsn.gc.ca](mailto:andrew.mcallister@cnsccsn.gc.ca)>;

Vary, Beth <[beth.vary@cnsccsn.gc.ca](mailto:beth.vary@cnsccsn.gc.ca)>; Duchesne, Daniel <[daniel.duchesne@cnsccsn.gc.ca](mailto:daniel.duchesne@cnsccsn.gc.ca)>

**Subject:** Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

**Importance:** High

Dear [REDACTED]

As advised earlier, CNSC staff have completed a legal review of the draft Moltex -CNSC service agreement towards review of the WATSS facility. Please find attached herewith the updated draft of the agreement for your perusal.

The key Changes in the document include:

- moving the clauses related to intellectual property into a dedicated section in the main body of the agreement;
- and simplifying the guidelines related to confidential information (Appendix B).

We have done this based on comments from CNSC staff's legal review and subsequently comparing several recent service agreements to ensure consistency and clarity. With this, CNSC staff are ready to initiate signatures of the agreement once you advise Moltex is ready to go forward on this.

As noted earlier, this agreement will be signed by the new President of the CNSC , Mr. Pierre Tremblay. I will be initiating this, as soon as I hear back from you on Moltex's readiness to go forward with this agreement.

Sincerely,

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

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**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** August 27, 2024 12:29 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED] McAllister, Andrew; Vary, Beth; Duchesne, Daniel; Sigouin, Luc  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

**Importance:** High

Dear [REDACTED]

Thank you for the response.

CNSC staff will initiate approval/signatures of the draft service agreement from our end.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

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✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [REDACTED]  
**Sent:** Tuesday, August 27, 2024 10:13 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [REDACTED]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

---

Hello Julian,

We are happy with this final version and are good to execute. Please let us know when there is a version ready to sign.

We have discussed this at a high level before but we wanted to ensure full transparency with our schedule and plans to ensure expectations are aligned.

We will be focusing on WATSS Stage 1 tests at CNL for the remainder of 2024 and then fundraising and establishing a new commercial framework during the first half of 2025. From mid 2025 to end 2026 we will be completing primary R&D and conceptual engineering for WATSS. Much of this is done but cannot be complete until all primary R&D is done.

Once this agreement is signed we would like to engage with IAEA through 2025 to ensure we are incorporating Safeguards by Design and best practises into the design. We would like to do this at minimal cost, hopefully under the MSSP. We would then be engaging with CNSC more heavily with deliverables through 2026. We propose to agree schedules for this around Q2 next year.



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+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Sent:** Monday, August 26, 2024 10:05 AM  
**To:** [Redacted]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Hi [Redacted]

Following up on this. Do you have an update on when we can expect a response from Moltex on this draft SA.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** Amalraj, Julian  
**Sent:** Friday, August 16, 2024 1:36 PM  
**To:** [Redacted]  
**Cc:** [Redacted]; McAllister, Andrew <[andrew.mcallister@cnscccsn.gc.ca](mailto:andrew.mcallister@cnscccsn.gc.ca)>; Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)>; Duchesne, Daniel <[daniel.duchesne@cnscccsn.gc.ca](mailto:daniel.duchesne@cnscccsn.gc.ca)>  
**Subject:** Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Importance:** High

Dear [Redacted]

As advised earlier, CNSC staff have completed a legal review of the draft Moltex -CNSC service agreement towards review of the WATSS facility. Please find attached herewith the updated draft of the agreement for your perusal.

The key Changes in the document include:

- moving the clauses related to intellectual property into a dedicated section in the main body of the agreement;
- and simplifying the guidelines related to confidential information (Appendix B).

We have done this based on comments from CNSC staff's legal review and subsequently comparing several recent service agreements to ensure consistency and clarity. With this, CNSC staff are ready to initiate signatures of the agreement once you advise Moltex is ready to go forward on this.

As noted earlier, this agreement will be signed by the new President of the CNSC , Mr. Pierre Tremblay. I will be initiating this, as soon as I hear back from you on Moltex's readiness to go forward with this agreement.

Sincerely,

Julian


---


*Julian Amalraj M.Sc, P.Eng, PMP*

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 e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

**Hautfenne-Jewer, Celia**

---

**From:** Amalraj, Julian  
**Sent:** October 15, 2024 1:49 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED] McAllister, Andrew  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Dear [REDACTED]

The Moltex Service Agreement has been signed by the CNSC President as of Oct 8<sup>th</sup>, 2024. We will be sending to your attention, the Originals for signatures, shortly.

I will advise once we have sent them to your attention.

Julian

---

**From:** Amalraj, Julian  
**Sent:** October 7, 2024 9:39 AM  
**To:** [REDACTED]  
**Cc:** [REDACTED] McAllister, Andrew <andrew.mcallister@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <daniel.duchesne@cnscccsn.gc.ca>; Sigouin, Luc <luc.sigouin@cnscccsn.gc.ca>  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Hi [REDACTED]

The Service Agreement is currently with the Presidents Office for final signatures. We expect the approval/signature to happen in the next week at which point, We will contact you/Rory for completing the process.

Julian

---

**From:** [REDACTED]  
**Sent:** October 7, 2024 9:08 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** [REDACTED] McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <Daniel.Duchesne@cnscccsn.gc.ca>; Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hello Julian,

Late August, you told me that the process for the final signature was launched, with the expectation that everything could be settled by the second half of September. Have you had some feedback from this last action?



Moltex Energy  
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+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Sent:** August 27, 2024 1:29 PM  
**To:** [Redacted]  
**Cc:** [Redacted]; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)>; Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>; Sigouin, Luc <[Luc.Sigouin@cnscccsn.gc.ca](mailto:Luc.Sigouin@cnscccsn.gc.ca)>  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Importance:** High

Dear [Redacted]

Thank you for the response.

CNSC staff will initiate approval/signatures of the draft service agreement from our end.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
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☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [Redacted]  
**Sent:** Tuesday, August 27, 2024 10:15 AM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [Redacted]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hello Julian,

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---

**From:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>  
**Sent:** Monday, August 26, 2024 10:05 AM  
**To:** [Redacted]  
**Subject:** RE: Moltex\_WATSS\_Service\_Agreement\_(Working Draft)

Hi [Redacted]

Following up on this. Do you have an update on when we can expect a response from Moltex on this draft SA.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
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☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** Amalraj, Julian  
**Sent:** Friday, August 16, 2024 1:36 PM

To [REDACTED]  
Cc: [REDACTED] McAllister, Andrew <[andrew.mcallister@cnscccsn.gc.ca](mailto:andrew.mcallister@cnscccsn.gc.ca)>;  
Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)>; Duchesne, Daniel <[daniel.duchesne@cnscccsn.gc.ca](mailto:daniel.duchesne@cnscccsn.gc.ca)>  
**Subject:** Moltex\_WATSS\_Service\_Agreement\_(Working Draft)  
**Importance:** High

Dear [REDACTED]

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Sincerely,

Julian


---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

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Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** May 6, 2024 4:11 PM  
**To:** Amalraj, Julian  
**Subject:** RE: Orano meeting invite

Instead of attaching it, try forwarding it

-----Original Message-----

From: McAllister, Andrew  
Sent: Monday, May 6, 2024 3:42 PM  
To: Amalraj, Julian <julian.amalraj@cnsccsn.gc.ca>  
Subject: RE: Orano meeting invite

Thanks Julian.

I had a quick chat with NRCan this morning on the reprocessing ATIP and asked about this matter and they mentioned the meeting tomorrow.

It's not letting me open what you had attached (security issue?)

-----Original Message-----

From: Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>  
Sent: Monday, May 6, 2024 3:39 PM  
To: McAllister, Andrew <Andrew.McAllister@cnsccsn.gc.ca>  
Subject: FW: Orano meeting invite

Hi Andrew,

I think you should attend as well. Forwarding for your information. This meeting is tomorrow.

Julian

Julian Amalraj M.Sc, P.Eng, PMP  
Senior Project Officer / Agent principal de projet Nuclear Processing Facilities Division / Division des installations de traitement nucleaires Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire / (613) 818-0515  
e-mail: Julian.Amalraj@cnsccsn.gc.ca

-----Original Message-----

From: Henley, Tessa <tessa.henley@cnsccsn.gc.ca>  
Sent: Monday, May 6, 2024 2:36 PM  
To: Bourassa, Pascale <Pascale.Bourassa@cnsccsn.gc.ca>  
Cc: Brunarski, Lee <Lee.Brunarski@cnsccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>  
Subject: FW: Orano meeting invite

Good afternoon Pascale,

Please find attached an email chain between the CNSC and NRCAN on reprocessing. NRCAN has suggested that you attend a meeting tomorrow with [REDACTED] so we suggest following up with Jamie Fairchild to get the meeting details.

If you're able to share any information from this meeting afterwards, it would be most appreciated.

Thanks,  
Tessa

Tessa Henley  
(she, her, elle)

Policy Officer, International and Government Affairs Division Canadian Nuclear Safety Commission tessa.henley@cnsccsn.gc.ca

Agente des politiques, Division des affaires internationales et gouvernementales Commission canadienne de sûreté nucléaire tessa.henley@cnsccsn.gc.ca

-----Original Message-----

From: Fairchild, Jamie <jamie.fairchild@NRCAN-RNCAN.gc.ca>

Sent: Monday, May 6, 2024 2:09 PM

To: Henley, Tessa <tessa.henley@cnsccsn.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCAN-RNCAN.gc.ca>

Cc: Amalraj, Julian <Julian.Amalraj@cnsccsn.gc.ca>; Yuen, Pui Wai <puiwai.yuen@NRCAN-RNCAN.gc.ca>; Brunarski, Lee <Lee.Brunarski@cnsccsn.gc.ca>

Subject: RE: last week's discussion

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** July 24, 2024 11:28 AM  
**To:** Amalraj, Julian  
**Subject:** RE: Reprocessing and Enrichment Working Groups

Hi there,

I am assuming that we are fine with the criteria that they proposed? They seem similar to the reprocessing ones.

Cheers,

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Friday, July 19, 2024 8:01 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

FYI

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** Yuen, Pui Wai <[puiwai.yuen@NRCan-RNCan.gc.ca](mailto:puiwai.yuen@NRCan-RNCan.gc.ca)>  
**Sent:** Wednesday, July 17, 2024 4:49 PM  
**To:** [Tanya.Hinton@international.gc.ca](mailto:Tanya.Hinton@international.gc.ca); [naina.thoppil@international.gc.ca](mailto:naina.thoppil@international.gc.ca); Kim,Duck (ECCC) <[duck.kim@ec.gc.ca](mailto:duck.kim@ec.gc.ca)>; [jennifer.mckay@ec.gc.ca](mailto:jennifer.mckay@ec.gc.ca); [catalin.obreja@ec.gc.ca](mailto:catalin.obreja@ec.gc.ca); [Elizabeth.White-Senack@ised-isde.gc.ca](mailto:Elizabeth.White-Senack@ised-isde.gc.ca); Nourallah, Laura (ISED/ISDE) <[laura.nourallah@ised-isde.gc.ca](mailto:laura.nourallah@ised-isde.gc.ca)>; Reinholz, David <[David.Reinholz@cnscccsn.gc.ca](mailto:David.Reinholz@cnscccsn.gc.ca)>; Kent, Michael <[Michael.Kent@cnscccsn.gc.ca](mailto:Michael.Kent@cnscccsn.gc.ca)>; Henley, Tessa <[tessa.henley@cnscccsn.gc.ca](mailto:tessa.henley@cnscccsn.gc.ca)>; Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>; [marc.desrosiers@hc-sc.gc.ca](mailto:marc.desrosiers@hc-sc.gc.ca); [Daniel.Daigle@tc.gc.ca](mailto:Daniel.Daigle@tc.gc.ca); Dalzell, Matthew (PrairiesCan) <[matthew.dalzell2@prairiescan.gc.ca](mailto:matthew.dalzell2@prairiescan.gc.ca)>; Ballantyne, Anne (PrairiesCan) <[anne.ballantyne@prairiescan.gc.ca](mailto:anne.ballantyne@prairiescan.gc.ca)>; Rosaasen, Canute (PrairiesCan) <[Canute.Rosaasen@prairiescan.gc.ca](mailto:Canute.Rosaasen@prairiescan.gc.ca)>  
**Cc:** Gilbeau, Amanda <[amanda.gilbeau@nrca-rncan.gc.ca](mailto:amanda.gilbeau@nrca-rncan.gc.ca)>; Houlton, Colin <[colin.houlton@nrca-rncan.gc.ca](mailto:colin.houlton@nrca-rncan.gc.ca)>; Wilkinson, David (he, him | il, lui) <[david.wilkinson@NRCan-RNCan.gc.ca](mailto:david.wilkinson@NRCan-RNCan.gc.ca)>; Cox, Jenny <[jenny.cox@nrca-rncan.gc.ca](mailto:jenny.cox@nrca-rncan.gc.ca)>; Edwards, Geoff <[Geoff.Edwards@nrca-rncan.gc.ca](mailto:Geoff.Edwards@nrca-rncan.gc.ca)>; Anderson, Emma (she, her | elle, la) <[Emma.Anderson@nrca-rncan.gc.ca](mailto:Emma.Anderson@nrca-rncan.gc.ca)>; Goulding, Liam <[liam.goulding@nrca-rncan.gc.ca](mailto:liam.goulding@nrca-rncan.gc.ca)>; Fairchild, Jamie <[jamie.fairchild@NRCan-RNCan.gc.ca](mailto:jamie.fairchild@NRCan-RNCan.gc.ca)>; Temnikov, Dimitri <[dimitri.temnikov@NRCan-RNCan.gc.ca](mailto:dimitri.temnikov@NRCan-RNCan.gc.ca)>; Wittmann, Tess (she, her | elle, elle) <[tess.wittmann@nrca-rncan.gc.ca](mailto:tess.wittmann@nrca-rncan.gc.ca)>; Poupore, Jessica <[Jessica.Poupore@NRCan-RNCan.gc.ca](mailto:Jessica.Poupore@NRCan-RNCan.gc.ca)>; Rector, Brianna (she, her | elle, la) <[brianna.rector@nrca-rncan.gc.ca](mailto:brianna.rector@nrca-rncan.gc.ca)>  
**Subject:** Reprocessing and Enrichment Working Groups

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

PROTECTED A - PROTÉGÉ A

Dear Colleagues,

Thank you again for your support and flexibility as we determine the next steps for the reprocessing working

GROUP

Attached to this email are two sets of criteria for both working groups, and a timeline for the enrichment working group. For enrichment, our objective will be to assess the various criteria in relation to the 1973 enrichment statement by the Minister of Energy, Mines and Resources, Donald S. Macdonald (also attached for reference). We welcome any comments on either set of **criteria and confirmation of your organization's roles and key contacts by Wednesday, July 24, 2024**. We understand that there may be differences in staff representation for the two working groups if you could please indicate.

Once confirmed, NRCan will distribute the templates to populate for the various criteria. The leads of each criteria may wish to convene a meeting with the supporting organizations to coordinate analysis. We (NRCan) will soon also convene the first meetings for the criteria that we are leading (i.e. Technology Summary, Supply and Demand for Enriched Fuels/Materials, Economic Benefits and Costs, Energy Security and Industrial Development, International and Regional Relations on Enrichment, and Indigenous and Host Community Considerations).

We will send a calendar invite to the broad working group in the second half of August to reconvene and share updates. [REDACTED] and would like to further discuss this with you based on your organization capacity at the August meeting and the potential synergies between the two groups.

Thank you again for your expertise and collaboration. We look forward to working with you. Please forward to anyone in your organization who will be supporting this initiative that we may have missed.

Kind regards,  
Pui Wai Yuen

Pui Wai Yuen

Director | Directrice

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures

Natural Resources Canada | Ressources naturelles Canada

[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)

Tel: 613-218-5067

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** July 19, 2024 8:20 AM  
**To:** Amalraj, Julian  
**Subject:** RE: Reprocessing and Enrichment Working Groups

We can discuss further, but my inclination is to have Nhan be our rep on this given his role on OIF under SMR readiness, or at a minimum, have you both attend.

He is away on holidays, back on Monday.

I see that NRCAN has given everyone until Wednesday to comment on the criteria, etc. I see that they have repeated the reprocessing criteria. I suspect at a high level that they are fit for purpose in light of the fact that they were adopted for reprocessing.

Cheers,

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cncs-ccsn.gc.ca>  
**Sent:** Friday, July 19, 2024 8:01 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cncs-ccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

FYI

---

### *Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cncs-ccsn.gc.ca](mailto:Julian.Amalraj@cncs-ccsn.gc.ca)

---

**From:** Yuen, Pui Wai <puiwai.yuen@NRCAN-RNCan.gc.ca>  
**Sent:** Wednesday, July 17, 2024 4:49 PM  
**To:** Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; Kim,Duck (ECCC) <duck.kim@ec.gc.ca>; jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; Elizabeth.White-Senack@ised-isde.gc.ca; Nourallah, Laura (ISED/ISDE) <laura.nourallah@ised-isde.gc.ca>; Reinholz, David <David.Reinholz@cncs-ccsn.gc.ca>; Kent, Michael <Michael.Kent@cncs-ccsn.gc.ca>; Henley, Tessa <tessa.henley@cncs-ccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cncs-ccsn.gc.ca>; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; Dalzell, Matthew (PrairiesCan) <matthew.dalzell2@prairiescan.gc.ca>; Ballantyne, Anne (PrairiesCan) <anne.ballantyne@prairiescan.gc.ca>; Rosaasen, Canute (PrairiesCan) <Canute.Rosaasen@prairiescan.gc.ca>  
**Cc:** Gilbeau, Amanda <amanda.gilbeau@nrcan-rncan.gc.ca>; Hault, Colin <colin.hault@nrcan-rncan.gc.ca>; Wilkinson, David (he, him | il, lui) <david.wilkinson@NRCAN-RNCan.gc.ca>; Cox, Jenny <jenny.cox@nrcan-rncan.gc.ca>; Edwards, Geoff <Geoff.Edwards@nrcan-rncan.gc.ca>; Anderson, Emma (she, her | elle, la) <Emma.Anderson@nrcan-rncan.gc.ca>; Goulding, Liam <liam.goulding@nrcan-rncan.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCAN-RNCan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCAN-RNCan.gc.ca>; Wittmann, Tess (she, her | elle, elle)

<tess.wittmann@nrcan-rncan.gc.ca>; Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>; Rector, Brianna (she, her | elle, la) <brianna.rector@nrcan-rncan.gc.ca>

**Subject:** Reprocessing and Enrichment Working Groups

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

PROTECTED A - PROTÉGÉ A

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Kind regards,  
Pui Wai Yuen

Pui Wai Yuen

Director | Directrice

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures

Natural Resources Canada | Ressources naturelles Canada

[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)

Tel: 613-218-5067

## Hautfenne-Jewer, Celia

---

**From:** Amalraj, Julian  
**Sent:** July 24, 2024 11:45 AM  
**To:** McAllister, Andrew  
**Subject:** RE: Reprocessing and Enrichment Working Groups


Yes. They will need more input from GAC but they can figure this out as they progress.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Sent:** Wednesday, July 24, 2024 11:28 AM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** RE: Reprocessing and Enrichment Working Groups

Hi there,

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Cheers,

Andrew

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**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Friday, July 19, 2024 8:01 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

FYI

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

**From:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>

**Sent:** Wednesday, July 17, 2024 4:49 PM

**To:** Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; Kim,Duck (ECCC) <duck.kim@ec.gc.ca>; jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; Elizabeth.White-Senack@ised-isde.gc.ca; Nourallah, Laura (ISED/ISDE) <laura.nourallah@ised-isde.gc.ca>; Reinholz, David <David.Reinholz@cnscccsn.gc.ca>; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; Dalzell, Matthew (PrairiesCan) <matthew.dalzell2@prairiescan.gc.ca>; Ballantyne, Anne (PrairiesCan) <anne.ballantyne@prairiescan.gc.ca>; Rosaasen, Canute (PrairiesCan) <Canute.Rosaasen@prairiescan.gc.ca>

**Cc:** Gilbeau, Amanda <amanda.gilbeau@nrca-nrcan.gc.ca>; Hoult, Colin <colin.hoult@nrca-nrcan.gc.ca>; Wilkinson, David (he, him | il, lui) <david.wilkinson@NRCan-RNCan.gc.ca>; Cox, Jenny <jenny.cox@nrca-nrcan.gc.ca>; Edwards, Geoff <Geoff.Edwards@nrca-nrcan.gc.ca>; Anderson, Emma (she, her | elle, la) <Emma.Anderson@nrca-nrcan.gc.ca>; Goulding, Liam <liam.goulding@nrca-nrcan.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>; Wittmann, Tess (she, her | elle, elle) <tess.wittmann@nrca-nrcan.gc.ca>; Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>; Rector, Brianna (she, her | elle, la) <brianna.rector@nrca-nrcan.gc.ca>

**Subject:** Reprocessing and Enrichment Working Groups

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

PROTECTED A - PROTÉGÉ A

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Pui Wai Yuen

Director | Directrice

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures

Natural Resources Canada | Ressources naturelles Canada

[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)

Tel: 613-218-5067

**Pages 4181 to / à 4190  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**20(1)(b), 21(1)(a), 21(1)(b)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

**Hautfenne-Jewer, Celia**

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**From:** Amalraj, Julian  
**Sent:** June 7, 2024 2:28 PM  
**To:** [REDACTED]  
**Cc:** McAllister, Andrew; [REDACTED]; Vary, Beth; Duchesne, Daniel  
**Subject:** RE: Service level agreement

Hi [REDACTED]

We plan on internally meeting to discuss this. I will get back to you on this shortly.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet  
Nuclear Processing Facilities Division / Division des installations de traitement nucleaires  
Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [REDACTED]  
**Sent:** Friday, June 7, 2024 12:28 PM  
**To:** Duchesne, Daniel <Daniel.Duchesne@cnscccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca> [REDACTED]  
Vary, Beth <beth.vary@cnscccsn.gc.ca>  
**Subject:** RE: Service level agreement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Daniel, Julian,

Do you have an idea of an estimated timeframe in which the agreement could be finalized and signed?

Thanks





Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Sent:** Wednesday, May 29, 2024 4:29 PM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Vary, Beth <[beth.vary@cnscccsn.gc.ca](mailto:beth.vary@cnscccsn.gc.ca)> [REDACTED]  
**Subject:** RE: Service level agreement [REDACTED]

Good catch from [REDACTED]  
Here is one way this could be fixed:

**Old formulation:**

*This Agreement constitutes the entire agreement between the Parties with respect to the subject matter of this Agreement and supersedes and revokes all previous negotiations, arrangements, letters of intent, brochures, representations, and information conveyed, whether oral or in writing, between the Parties hereto or their representatives or any other person purporting to represent the CNSC or Moltex.*

One problem is that “the subject matter of this Agreement” is not clearly defined in the SA. Since this term is only used here, we can easily replace it by the actual subject matter.

**New formulation:**

*This Agreement constitutes the entire agreement between the Parties with respect to the pre-licensing review of the WATSS facility design and supersedes and revokes all previous negotiations, arrangements, letters of intent, brochures, representations, and information conveyed, whether oral or in writing, relating to this subject, between the Parties hereto or their representatives or any other person purporting to represent the Parties.*

That’s how I would fix this.  
Dan

---

**From:** [REDACTED]  
**Sent:** Wednesday, May 29, 2024 2:17 PM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Cc:** [REDACTED]; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>; Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hi Julian,

I have just figured out that the wording of one paragraph in the proposed agreement could have unforeseen consequences.

The last paragraph of section 1 (Purpose) states that *“This Agreement ... supersedes and revokes all previous negotiations, arrangements, letters of intent, brochures, representations, and information conveyed, whether oral or in writing, between the Parties thereto or their representatives or any other person purporting to represent the CNSC or Moltex.”*

Although it is mentioned at the beginning of the paragraph that the Agreement constitutes the entire agreement between the parties **with respect to the subject matter** described, this precision is not mentioned when listing the elements that the Agreement supersedes and revokes.

The point is that Moltex has a service agreement with the CNSC related to the SSR-W reactor in the framework of the VDR, and it seems that the agreement in this regard has never been terminated.

May I propose to add at the end of the paragraph a precision such as *“ It does not affect, supersede or revoke earlier agreements between the Parties with respect to other subject matters than those described in Section 9 of Part II (Scope of services), and will not be affected, superseded or revoked by such agreements in the future.”*

Thanks



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From** [Redacted]  
**Sent:** Tuesday, May 14, 2024 2:39 PM  
**To:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>  
**Cc:** [Redacted] McAllister, Andrew <[Andrew.McAllister@cnsccsn.gc.ca](mailto:Andrew.McAllister@cnsccsn.gc.ca)>;  
Duchesne, Daniel <[Daniel.Duchesne@cnsccsn.gc.ca](mailto:Daniel.Duchesne@cnsccsn.gc.ca)>  
**Subject:** RE: Service level agreement

Hi Julian,

Please find attached the draft document with some reviewed sections. It is essentially an update of physical addresses, phone numbers or contact persons. The rest of the document is reportedly acceptable to Moltex.

Best regards,





Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** Monday, May 13, 2024 3:16 PM

**To:** [Redacted] >

**Cc:** [Redacted] McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>;

Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>

**Subject:** RE: Service level agreement

Hi [Redacted]

Following up to see if there is an update on this from Moltex.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

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☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [Redacted]

**Sent:** Thursday, April 11, 2024 8:16 AM

**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Cc:** [Redacted] McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>;

Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>

**Subject:** RE: Service level agreement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Thanks Julian.

We will go through the proposal and get back to you with our feedback.



Moltex Energy  
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+1 506 214 8551 \* [info@moltexenergy.com](mailto:info@moltexenergy.com) \* [www.moltexenergy.com](http://www.moltexenergy.com)

---

**From:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>

**Sent:** Wednesday, April 10, 2024 5:31 PM

**To:** [REDACTED]

**Cc:** [REDACTED] McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>;  
Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>

**Subject:** RE: Service level agreement

Bonjour [REDACTED]

As communicated earlier, please see attached herewith a working draft of the proposed service agreement as requested by Moltex. This is an initial working draft and a lot of the work on this draft service agreement was based on the initial letter from Moltex regarding the nature of the services, type of information to be shared and the topics to be covered under this agreement.

At this point, CNSC staff suggest that once Moltex has reviewed this draft and is ready for further discussions, a more detailed conversation is needed to elucidate further details that will allow for additional clarity and support finalizing this agreement.

In the mean time, if you have any questions on this please do not hesitate to contact me.

Merci,

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

---

**From:** [REDACTED]

**Sent:** [REDACTED]

**To:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>; Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>

**Cc:** [REDACTED] McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>

**Subject:** RE: Service level agreement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hello Daniel,

Julian sent me the message below early last week. Could you tell me if the process is about to be finalized?

Thanks



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**From:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>

**Sent:** Tuesday, March 26, 2024 10:15 AM

**To:** [Redacted]

**Cc:** Duchesne, Daniel <[Daniel.Duchesne@cnsccsn.gc.ca](mailto:Daniel.Duchesne@cnsccsn.gc.ca)>; [Redacted]

McAllister, Andrew <[Andrew.McAllister@cnsccsn.gc.ca](mailto:Andrew.McAllister@cnsccsn.gc.ca)>

**Subject:** RE: Service level agreement

Hi [Redacted]

Dan should be contacting you shortly with the draft.

Sorry about the delay in response, I was out of office last week on inspections.

Julian

---

*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

☎ (613) 818-0515

✉ e-mail: [Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)

---

**From:** [Redacted]

**Sent:** Monday, March 18, 2024 2:56 PM

**To:** Amalraj, Julian <[Julian.Amalraj@cnsccsn.gc.ca](mailto:Julian.Amalraj@cnsccsn.gc.ca)>

**Cc:** Duchesne, Daniel <[Daniel.Duchesne@cnsccsn.gc.ca](mailto:Daniel.Duchesne@cnsccsn.gc.ca)>; [Redacted]

**Subject:** RE: Service level agreement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hi Julian,

Could you tell me if the Service Agreement is ready, and/or if there are still some issues to address?

Thanks



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---

**From:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Sent:** Wednesday, February 21, 2024 10:38 AM  
**To:** [Redacted]  
**Cc:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

Hi [Redacted]  
Yes, we have received the [Redacted]  
Your point of contact for the CNSC work is Julian Amalraj (Senior Project Officer, Nuclear Processing Facilities Division). I am sending a last set of suggestions to Julian on the draft SA by end of today. Contact him in a week to see where the SA stand.  
Regards,  
Dan

---

**From:** [Redacted]  
**Sent:** Wednesday, February 21, 2024 8:06 AM  
**To:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Bonjour Daniel,  
  
As-tu une idée de l'état d'avancement du dossier?  
  
Merci



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---

**From:** [REDACTED]  
**Sent:** Thursday, February 15, 2024 2:56 PM  
**To:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Cc:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>; Morin, Chantal <[Chantal.Morin@cnscccsn.gc.ca](mailto:Chantal.Morin@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

Hello Daniel,

Do you have an idea of the status for the preparation of the agreement?  
It is my understanding that from our side the deposit had been paid upon reception.



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**From:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Sent:** Friday, January 12, 2024 4:34 PM  
**To:** [REDACTED]  
**Cc:** Amalraj, Julian <[Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)>; Morin, Chantal <[Chantal.Morin@cnscccsn.gc.ca](mailto:Chantal.Morin@cnscccsn.gc.ca)>; McAllister, Andrew <[Andrew.McAllister@cnscccsn.gc.ca](mailto:Andrew.McAllister@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

Bonjour [REDACTED]  
Julian Amalraj in the Nuclear Processing Facilities Division (NPF) will be responsible for all the work done under the WATSS Service Agreement (SA), including discussing the SA with Moltex. The \$5000 deposit is required before the SA is completed and you should get the fee notice soon (Julian is getting this done).  
Dan

---

**From:** [REDACTED]  
**Sent:** Thursday, January 11, 2024 8:37 AM  
**To:** Duchesne, Daniel <[Daniel.Duchesne@cnscccsn.gc.ca](mailto:Daniel.Duchesne@cnscccsn.gc.ca)>  
**Subject:** RE: Service level agreement

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Bonjour Daniel,

As-tu une idée du délai dans lequel l'accord pourra être rédigé et signé?

Je me doute que c'est seulement à ce moment que la note pour le dépôt de garantie pourra être émise.

Bien à toi,



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**From:** [Redacted]  
**Sent:** Thursday, January 4, 2024 9:32 AM  
**To:** 'Duchesne, Daniel' <[Daniel.Duchesne@cnsccsn.gc.ca](mailto:Daniel.Duchesne@cnsccsn.gc.ca)>  
**Cc:** [Redacted]  
**Subject:** RE: Service level agreement

Bonjour Daniel, et bonne année.

Pourrais-tu me dire si la rédaction de l'accord est en bonne voie et/ou s'il reste des actions en attente de notre part?

Merci



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# Used Fuel Reprocessing Working Group

Kick-Off Meeting – Feb. 23, 2024

Canada

# Agenda

1. Welcome
2. Introductions
  - Roundtable
3. Recap of planned work and proposed outcomes
4. Work Plan Discussion
  - Explore comments and seek consensus on the proposed work plan and criteria, establishing a clear scope of work
  - Finalize criteria for analysis
  - Identify lead and participating departments for each criteria
5. Action Items and Next Meeting Date




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# Objective

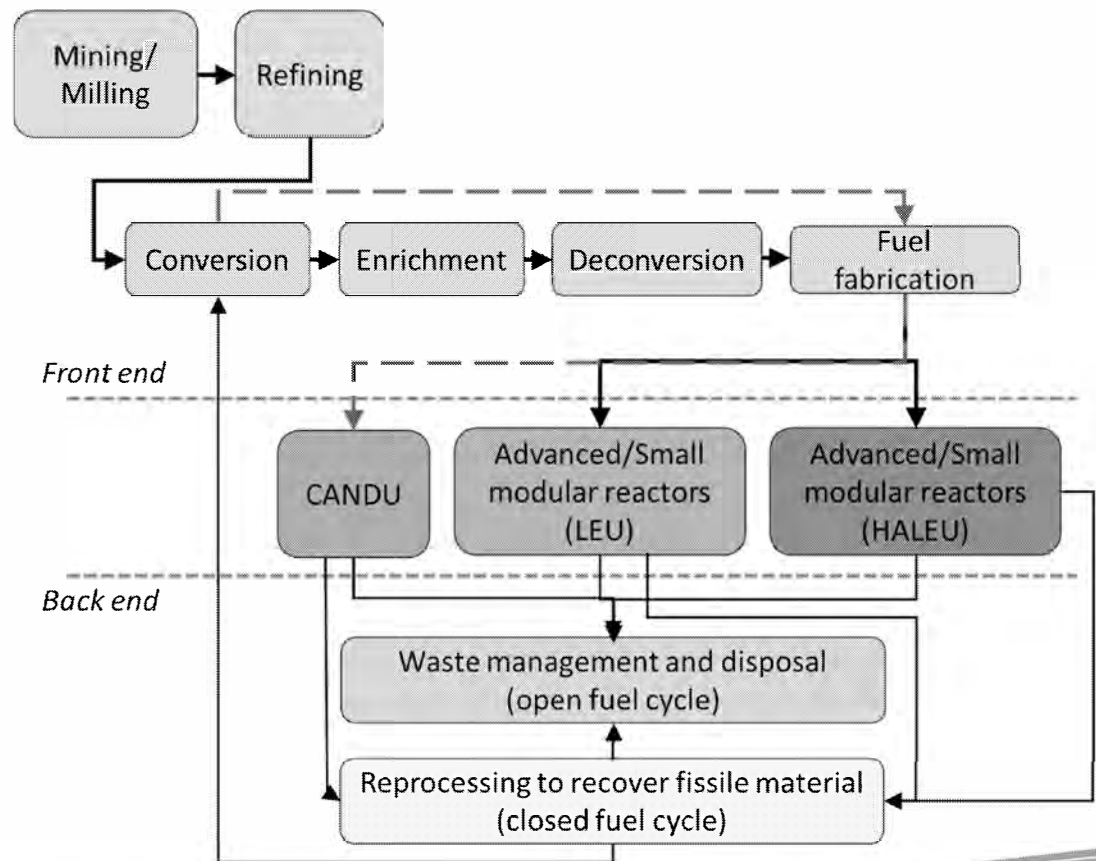
- Develop a documented analysis for used fuel reprocessing in Canada
- 
- Key Outcomes of the Work:
  - Each government department should be comfortable with the fact pattern and collective analysis that is developed.
  - Aim to facilitate future discussions by having a common foundation.
  - Well position GoC to make important decisions for future policy work.

**Today's Objective:** Identify participation and working groups for analysis



# What is reprocessing?

- IAEA Nuclear Safety and Security Glossary – 2022 Interim Edition
  - Reprocessing: A *process or operation*, the purpose of which is to extract *radioactive isotopes* from *spent fuel* for further use.
- What will be needed and what will enable us to meet our net-zero objectives – considerations related to advanced fuel cycles and the role of the federal government in supporting these advanced fuel cycles.



# Method and Proposed Work

- Develop a series of discussion papers that evaluate criteria important to decision makers.
  - Based on the method utilized to set out the Governments “attitude towards the establishment of uranium enrichment facilities in Canada” in the 1970s.
    - This analysis has not been repeated since that time.
- This work will endeavor to modernize the criteria considered in the 1970s and adapt them for reprocessing.

- 



# Timelines

Current planned work		
Scoping + Plan (complete)	Initial work (February – April 2024)	Analysis (March – Fall 2024)
<ul style="list-style-type: none"> <li>Scoping of analysis</li> <li>Identification of key internal partners</li> <li>Establish governance plan</li> </ul>	<ul style="list-style-type: none"> <li>Identify criteria set out in scoping exercise</li> <li>Develop paper(s) to guide internal and intra governmental consultations</li> <li>Establish partner OGD and organizations</li> </ul>	<ul style="list-style-type: none"> <li>Undertake detailed analysis of criteria</li> <li>Circulate documents to key government departments and organizations</li> </ul>

Outcomes and Objectives
<p><b>Decision Point</b></p> <p><u>Work products at this stage:</u></p> <p>Obtain consensus among OGDs</p> <p>Series of internal discussion papers with analysis of each of the criteria for consideration and an executive summary</p> <p><u>Decision to proceed to engagement should be based on:</u></p> <p>need for public policy</p> <p>ongoing activities in the nuclear sector</p> <p>consultation of OGD collaborators and contributors</p>

Possible post-decision point steps (not currently planned)
Engagement
Dispositioning
Final Analysis
Decision
Cabinet



# Example – Uranium Supply & Demand

## Supply and demand for uranium and the implications of a closed fuel cycle on fuel supply in Canada, for Canadian reactors

LEAD DEPARTMENT: Natural Resources Canada

### BACKGROUND

Canada is a leader in uranium production, fuel supply (refinement/ conversion/ fabrication), and nuclear energy and technology, and has considerable existing uranium mining and milling capacity.

Canada's nuclear power industry has been self-reliant for decades by virtue of its vertically integrated domestic fuel and technology supply chain. This was most evident during the COVID pandemic and recently following the invasion of Ukraine. Most operating nuclear power reactors in the world and most prospective small modular reactors (SMRs) are/will be fueled by enriched uranium. Canadian CANDU nuclear reactors are an exception as they are fueled by unenriched "natural" uranium.

Globally, there are reactors that utilize reprocessed used nuclear fuel as fuel. These can serve as secondary supplies and offset the demand for fresh fuel – be it natural or enriched uranium products. In general, reprocessing can be beneficial for countries with limited uranium supplies, as they are able to make use of spent energy in nuclear fuels that have already been used once in nuclear reactors. This can provide security of supply and is generally built into national policy frameworks.

The invasion of Ukraine has raised concerns about the security of the global nuclear fuel supply and put significant upward pressure on prices, which have increased 50% (highest since 2011).

### CANADIAN URANIUM AND FUEL SUPPLY

Canada has historically held ample supply of domestic uranium resources, and so reprocessing was never deemed necessary nor cost-effective as a means of providing fuel for the reactor fleet. In 2021, 10% of the world's uranium was mined in Canada. Canada is the second largest uranium producer in the world, with production worth \$500M (2021). Of the uranium mined in Canada in 2021, 69% was exported for use in foreign nuclear power reactors and 31% used to fuel Canadian nuclear power reactors.<sup>1</sup>

At the current levels of production and price, Canadian uranium deposits will last for another forty years.<sup>2</sup> There are known uranium resources of 694,000 tonnes of U3O8 (568,500 tU), but this is estimated to be higher with continuing exploration.<sup>3</sup> Estimates indicate that Canadian uranium yield rates are 10 to 100 times superior to those in other uranium producing countries.<sup>4</sup>

Canada can expand uranium mining, but uranium refining and conversion facilities are nearing capacity and require capital investments and lengthy regulatory approvals to expand, with some site-specific limitations.

At this time, all operating uranium mines and mills in Canada are located in northern Saskatchewan. Grand Canada (formerly Areva Resources Canada) and Cameco Corporation are the licensees of the active mining and milling facilities.<sup>5</sup>

The active mining and milling facilities include:<sup>5</sup>

- Cigar Lake Mine
- Key Lake Mill
- McArthur River Mine
- McClean Lake Mill
- Rabbit Lake Mine and Mill

Table 1. Annual uranium production in Canada (tonnes U)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
McArthur River	7744	7356	7354	6926	6193	76	0	0	0	428
Cigar Lake	0	132	4345	6666	6925	6925	6925	3885	4693	6928
McClean Lake	0	43	0	0	0	0	0	0	0	0
Rabbit Lake	1587	1602	1621	428	0	0	0	0	0	0
Total	9331	9134	13,320	14,022	13,116	7001	6925	3885	4693	7351
of World	59,331	56,041	60,304	63,207	60,514	54,154	54,742	47,731	48,332	48,888

Source: World Nuclear Association

Proposed uranium mining and milling projects:

- Wheeler River, Denison Mines Corporation
  - Proposing to develop an operation that would produce up to 5,400 tonnes of uranium oxide annually for 20 years.
- Rook I, NexGen Energy Ltd.
  - The proposed Rook I project includes underground and surface facilities to support the mining and processing of uranium ore. The main components include an underground mine, an onsite mill to process an average of 1,400 tonnes of ore per day, surface facilities to support the short- and long-term storage of waste rock and ore, an underground tailings management facility, water-handling infrastructure and an effluent treatment circuit, and additional infrastructure to support mining activities.

Currently, there are 5 licensed uranium processing and fuel fabrication facilities operating in Canada:<sup>7</sup>

- Blind River Uranium Facility (Canada's only refining facility)
- Port Hope Conversion Facility (Canada's only conversion facility)
- Cameco Fuel Manufacturing Inc.
- BWXT Nuclear Energy Canada Inc. - Toronto
- BWXT Nuclear Energy Canada Inc. - Peterborough

## CANADIAN URANIUM AND FUEL DEMAND

To date, given Canada's large high-grade uranium deposits, the low price of uranium, and the high cost of reprocessing spent fuel, the nuclear industry has not deemed it necessary nor cost-effective to reprocess spent fuel for Canada's reactors.

To better understand future uranium needs, Natural Resources Canada solicited projections from IAEA...

based on the IAEA SWR August 2022 with

Table 2. Reactor deployments that underpin the fuel projections



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s.13(1)(c)  
s.21(1)(a)  
s.21(1)(b)

Table 3. Fuel Composition by Reactor Type, indicating Previously or Currently Used Fuels (o), and Proposed or Theoretical Fuels (x).

Reactor Type	Natural U	Enriched U*	Reprocessed U**	MOX	Other Fuels†
PWR	o	o	o	o	o
PHWR	o	o	o	x	x
BWR		o	x	x	
HTGR	o			x	o
MSR		o	x	x	o
SFR		o		o	x
GCR/AGR	o	o			
Heat Pipe Microreactor		x			x

\*Enriched uranium includes U-235 (enriched) and U-238 (depleted) isotopes. U-235 is typically enriched between 3% and 5% U-235. Some reactors can make use of reprocessed uranium or MOX fuels.  
\*\*Reprocessed uranium (RU), also called spent nuclear fuel (SNF), is a by-product of nuclear power generation. It is typically enriched between 0.2% and 0.9% U-235. It can be used as fuel in reactors or as a source of plutonium for MOX fuel. It can also be used as a source of thorium for thorium-based fuels.  
†Other fuels include thorium-based fuels, ceramic fuels, metal alloys, and fuels using non-uranium isotopes, such as plutonium-based fuels, cermet fuels, metal alloys, and fuels.

**Pressurized Water Reactor (PWR)** technologies typically make use of uranium dioxide (UO<sub>2</sub>) powder that is sintered into hard ceramic pellets typically enriched between 3 and 5% U-235. Some reactors can make use of reprocessed uranium or MOX fuels.

**Pressurized Heavy Water Reactors (PHWR)** of the CANDU type (large-scale nuclear currently deployed in Canada) typically use natural uranium (0.7% U-235) based sintered pellets. Studies have demonstrated that CANDU type reactors could use reprocessed U from LWRs of slightly enriched U (e.g. low-enriched uranium fuel, LEU), MOX-type fuel has been tested in research reactors. The design for the AWR-300 in India is proposed to use thorium-based fuels, such as Th/U and Th/Pu MOX-type.

**Boiling Water Reactor (BWR)** technologies use fuels similar to PWRs, with fuels typically enriched to near 2.5% U-235.

**High Temperature Gas Reactors (HTGR)** are currently expected to use uranium-based oxides or carbides with HALEU at ~20% U-235, but could make use of other alternative and recycled fuels, including U-Pu, Pu, MOX, and U-Th.

**Molten Salt Reactors (MSR)** can use a wide range of fuels, although the reference fuel salt is typically a molten mixture of lithium and beryllium fluoride (LiBeF<sub>4</sub>) with dissolved low-enriched uranium (U-235) fluoride (UF<sub>4</sub>). MSRs may make use of spent fuel from other reactors, mixed uranium/plutonium oxide fuels, or other fuels including Th and U-233.

**Sodium Fast Reactors (SFR)** are currently expected to use uranium-based fuels, either in a mixed oxide form (MOX), U fuel with U-235 between 5–20%, or mixed metal alloys. Operational SFR in Russia have used enriched U or reprocessed U in their fuels.

**Gas Cooled Reactors (GCR)** can use UO<sub>2</sub> fuel with U-235 typically between 2.5%–3.5%. The Magnox reactors (UK) used natural uranium.

**Heat Pipe Microreactors (HPR)** are microreactor designs which could use HALEU up to 19.75% U-235 in some designs, or Ceramic metal composite (CERMET) fuel with dispersed UO<sub>2</sub>, UN, or UC kernels dispersed, e.g., W-6C CERMET fuel.

Table 4. Projected Canadian Demand for Enriched Fuel

TIMELINE	ENRICHED FUEL* (in tonnes)		
	HALEU	LEU+	LEU
Until 2030			
Until 2035			

\*HALEU: High Assay Low Enriched Uranium, enriched between 5 and 20% U-235.  
LEU+: Low Enriched Uranium Plus, enriched between 5–20% U-235.  
LEU: Low Enriched Uranium, enriched up to 5%.

**GLOBAL URANIUM SUPPLY AND DEMAND**

Currently, some 60,000 tonnes of uranium are required annually to fuel the world's 410 operating nuclear power reactors. However, with countries increasingly expected to turn to nuclear power to address climate change, energy security and sustainable development, demand could be as high as 100,000 tonnes of uranium per year by 2040. That would require a near doubling of uranium mining and processing from current levels.<sup>9</sup>

Mines in 2021 supplied some 56,901 tonnes of uranium oxide concentrate (U<sub>3</sub>O<sub>8</sub>) containing 48,303 tU, 77% of the world's annual requirements. The balance is made up from secondary sources including stockpiled uranium held by utilities, and in the last few years of low prices those civil stockpiles have been built up again following their depletion over 1990-2000. Nuclear fuel supply may be from secondary sources including recycled uranium and plutonium from used fuel, as mixed oxide (MOX) fuel.<sup>10</sup>

In December 2023, at the 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change in Dubai, 22 countries, including Canada, agreed to triple global nuclear power capacity by 2050 to help reach global net-zero emissions.

**Russia Impacts**

Close allies, including the U.S., U.K., EU, and France, rely on nuclear to power their economies and view nuclear as key to advancing their

Table 5. Global nuclear supply and Russian supply

	% of electricity supplied by nuclear power	% of nuclear fuel supplied by Russia
E.U.	22%	~25%
U.S.	20%	~20%
France	69%	~20%
U.K.	15%	?
Canada	15%	0%

**GLOBAL REPROCESSING**

Used nuclear fuel has long been reprocessed to extract fissile materials for recycling and to reduce the volume of high-level wastes. Several European countries, Russia, China and Japan have policies to reprocess used nuclear fuel, although government policies in many other countries do not see used fuel as a resource but rather a waste.<sup>11</sup>

Table 6. Key commercial reprocessing facilities globally

Facility	Country	Company	Method	Reprocessing Capacity (tonnes/year)
La Hague	France	Orano	PUREX	1600
RT-1 (Mayak)	Russia	Rosatom	PUREX	400
PPFPRE (Tarapur)	India	NPCIL	PUREX	200
Kalsakham	India	NPCIL	PUREX	100
Roikasho	Japan	JNFL	PUREX	800



Natural Resources Canada

Ressources naturelles Canada



# Work Plan - For Discussion

Criteria	Lead Department	Supporting Department(s)	Kept in the loop
Technology Summary	NRCan		
Supply and demand for uranium and the implications of different fuel cycles	NRCan	GAC RDAs	
Environmental effect (+ waste)	<sup>RIO</sup> ECCC CNSC	NRCan HC (if includes humans)	
Economic and cost-benefit analysis for a plant, competitiveness, investors	NRCan	ISED ECCC	
Domestic Regulatory environment	CNSC	NRCan	
Energy Security and industrial development	NRCan	GAC ISED	
Non-Proliferation and safeguarding, import and export control considerations	GAC CNSC	NRCan	
International and regional relations on reprocessing	GAC NRCan	RDAs	
Indigenous and Host Community considerations	ECCC NRCan	HC RDAs	CNSC

Slide 9

---

**RIO** Think this was updated to NRCan below (slide 15)  
Rector, Brianna (she, her | ell, 2024-03-15T18:39:48.927

**RIO 0** / would it make more sense to update to completely match the summary notes table?  
Rector, Brianna (she, her | ell, 2024-03-15T18:43:46.202

# Action Items and Next Meeting Date



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# Canada

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# NEW: Technology Summary

- High-level description of the different used fuel reprocessing technologies
  - PUREX reprocessing
  - Molten salt electro-refining
  - Oxide electrowinning process
  - Fluoride volatility process

---

## Participants

Lead: NRCan

Support:

Stay in the loop:

---



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# Supply and demand for uranium and the implications of different fuel cycles

- Domestic uranium supply
- Domestic fuel supply
- Current domestic uranium and fuel demand
- Future domestic uranium and fuel demand
  
- Current global reprocessed uranium supply
- Uses of reprocessed uranium (current global utilization)
- Future global utilization of uranium, and potential demand for alternative uranium sources (RepU)

---

## Participants

Lead: NRCan

Support: GAC + RDAs

Stay in the loop:

---



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# Environmental effect (+ waste)

- What are the unique waste streams with reprocessing technologies:
  - (1) PUREX reprocessing (2) molten salt electro-refining
  - (3) oxide electrowinning process (4) fluoride volatility process
- What solutions does Canada have in place for these waste streams
- What novel environmental impacts would we expect from a reprocessing facility (vs. existing fuel cycle facilities)
- How would reprocessing of used fuel contribute to sustainable development goals (open vs. closed cycles)
  - What amount of waste would be generated/diverted?
  - What amount of uranium would be diverted?

---

## Participants

Lead: ECCC + CNSC

Support: NRCan + HC

Stay in the loop:

---



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# Economic and cost-benefit analysis for a plant, competitiveness, investors

- Macro-economics
- Labor force requirements
- Major costs associated with:
  - CapEx and OpEx
    - benchmark with international examples where possible
  - Taxation
  - IP payments as necessary
- Sale price of material
- Potential Canadian economic impact of:
  - Domestic deployment only
  - Domestic deployment and export
  - No reprocessing

---

## Participants

---

Lead: NRCan

Support: ISED + ECCC

Stay in the loop:

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Domestic Regulatory environment

- What parts of the current regulatory framework impact reprocessing
  - NSCA
  - IAA
  - Reg docs
  - CSAs
- What are the key gaps in Canada's regulatory frameworks for reprocessing?
- What additional capacity would we anticipate being needed at implicated departments and agencies to support this technology in Canada

---

## Participants

Lead: CNSC

Support: NRCan

Stay in the loop:

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Energy security and industrial development

- Canada's nuclear energy and technology industrial strategy – how would reprocessing fit/contribute to Canada's overall objectives for its nuclear sector
- Energy security
  - Future energy needs
  - Non-emitting energy needs
    - How do these interface with nuclear deployment
    - What gaps identified in the supply and demand section can be addressed
- Identify key reactor types that would support the use of RepU
  - Identify scenarios in the long term where we might expect reprocessing to be beneficial to Canada (how many reactor deployments domestically/internationally)

---

## Participants

Lead: NRCan

Support: GAC + ISED

Stay in the loop:

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Non-Proliferation and safeguarding, Import and export control considerations

- What would the deployment of reprocessing change for Canada's safeguarding and non-proliferation programs
- Costs of inspections and associated costs to the sector
- Canada's import and export regime, and what would it take to import or export material and/or technologies?
- Evaluate implications for the list of nuclear dual use items

---

## Participants

Lead: GAC + CNSC

Support: NRCan

Stay in the loop:

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# International and regional relations on reprocessing

- What provinces would consider this and for what reasons?
  - What do the provinces want/need from the GOC?
- Implications for the Canada's international commitments – including non-proliferation
- Impact on other areas of international importance?

---

## Participants

Lead: GAC + NRCan

Support: RDAs

Stay in the loop:

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Indigenous and Host Community considerations

- What would the needs of a host community and local Indigenous community be should this technology be deployed?
- Are any communities seeking the deployment of this technology?
- What challenges would we anticipate from the wider public?

---

## Participants

Lead: ECCC + NRCan

Support: HC + RDAs

Stay in the loop: CNSC

---



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

## Hautfenne-Jewer, Celia

---

**From:** Saika Sarazin <Saika.Sarazin@invcanada.ca>  
**Sent:** September 16, 2024 10:27 AM  
**To:** O'Keefe, Paul (ISED/ISDE); Nourallah, Laura (she, her | elle, la) (ISED/ISDE; White-Senack, Elizabeth (ISED/ISDE); Hoult, Colin; Yuen, Pui Wai; Fairchild, Jamie; Calvert, Tom; Jean-Benoit.LebLANc@international.gc.ca; Prosser, Kathleen; Manandhar, Sujata (she, her | elle, elle); Dutt, Amitabh; Temnikov, Dimitri; naina.thoppil@international.gc.ca; Tanya.Hinton (Tanya.Hinton@international.gc.ca); Rouleau, Kimberly -BIS [She,Her | Elle]; Mikhael, Marc -BIS; Thierry.Weissenburger@international.gc.ca; Philippe Ferland; Dejan Velichkov; Tamaika Jumelle; Henley, Tessa; Bourassa, Pascale; McAllister, Andrew; Gratton, Wayne; Jason.Kenney@NRCan-RNCan.gc.ca; Tremblay, Philippe; Boissy, Guillaume -PARIS -TD  
**Cc:** Amalraj, Julian  
**Subject:** Update on Project Yellow

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

Hi Project Yellow Team,

In advance to our deal team call this Wednesday, I would like to share with you some updates regarding the project.

Many thanks for all your collaboration and expertise and willingness to work together as a team. I look forward to seeing you on our last deal team call this week to discuss and hear comments and feedback regarding the file.

Best regards,  
Saika

**Saika Sarazin**

Senior Advisor, Investor Services | Conseillère principale, services aux investisseurs

Invest in Canada | Investir au Canada

T 613 292-6817

160 Elgin St. | 160 rue Elgin

Ottawa, Ontario, K1A 0W9

[investcanada.ca](http://investcanada.ca) | [investircanada.ca](http://investircanada.ca)



-----Original Appointment-----

**From:** Saika Sarazin

**Sent:** May 29, 2024 7:45 AM

**To:** Saika Sarazin; O'Keefe, Paul (ISED/ISDE; Nourallah, Laura (she, her | elle, la) (ISED/ISDE; White-Senack, Elizabeth (ISED/ISDE); Hoult, Colin; Yuen, Pui Wai; Fairchild, Jamie; Calvert, Tom; Jean-Benoit.LebLANC@international.gc.ca; Prosser, Kathleen; Manandhar, Sujata (she, her | elle, elle); Dutt, Amitabh; Temnikov, Dimitri; naina.thoppil@international.gc.ca; Tanya.Hinton (Tanya.Hinton@international.gc.ca); Kimberly.Rouleau@international.gc.ca; Marc.Mikhael@international.gc.ca; Thierry.Weissenburger@international.gc.ca; Philippe Ferland; Dejan Velichkov; Tamaïka Jumelle; Henley, Tessa; Pascale.Bourassa@cnsC-ccsn.gc.ca; Andrew.McAllister@cnsC-ccsn.gc.ca; wayne.gratton@cnsC-ccsn.gc.ca; Jason.Kenney@NRCAN-RNCAN.gc.ca; Tremblay, Philippe; Guillaume.Boissy@international.gc.ca

**Cc:** Amalraj, Julian

**Subject:** Project Yellow - Deal Team

**When:** September 18, 2024 10:00 AM-10:30 AM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Microsoft Teams Meeting

Hello everyone,

As we discussed last week, please find the invitation for our deal team call regarding Project Yellow.

I look forward to talk to you soon!

Best regards,  
Saïka

---

## Microsoft Teams [Need help?](#)

### [Join the meeting now](#)

Meeting ID: 249 235 844 477

Passcode: fqQZmn

---

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---

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### [Rejoignez la réunion maintenant](#)

ID de réunion : 249 235 844 477

Code secret : fqQZmn

---

## Participer par téléphone

+1 647-497-6301,,823477468# Canada, Toronto

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ID de conférence téléphonique : 823 477 468#

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## Hautfenne-Jewer, Celia

---

s.20(1)(b)

**From:** McAllister, Andrew  
**Sent:** July 7, 2025 4:10 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: Moltex - CNSC agreement  
**Attachments:** Moltex WATSS pre-licensing v2.docx

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>

**Sent:** April 9, 2025 1:34 PM

**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <Daniel.Duchesne@cnscccsn.gc.ca>; Belyea, Sean <Sean.Belyea@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>

**Cc:** Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>

**Subject:** RE: Moltex - CNSC agreement

Hello there,

Please see attached a updated (v2) draft press release from Moltex on the topic of Moltex initiating pre-licensing review thru a service agreement signed with the CNSC. ~~Information on this document is confidential and intended only for the individuals named in this email.~~

Per, Moltex this press release is expected to be released next Monday.

**If you have any comments, please send it to me by Close of Day April 10<sup>th</sup>, 2025.**

Julian



## Moltex Energy Initiates Pre-Licensing Review of WATSS Technology with CNSC

**Saint John, NB, 3 March 2025** – Moltex Energy Canada Inc. (Moltex) has recently entered into a Service Level Agreement with the Canadian Nuclear Safety Commission (CNSC) in relationship to the development of the WASTE To Stable Salt (WATSS) process.

This agreement lays out a framework for engagement and discussions with the regulator to receive feedback on key topical areas such as safeguards, safety and security, to ensure that regulatory requirements are suitably taken into account at every stage of the development.

This framework will in turn allow the CNSC to facilitate engagement with the International Atomic Energy Agency (IAEA) to guarantee that the WATSS facility and associated fuel cycle will be compatible with the application of international obligations under the Non-Proliferation Treaty, and ensure best practises are incorporated into the design as early as possible.

Moltex has recently validated the WATSS process with used CANDU fuel and is now progressing with the engineering design and safety analysis of the commercial facility.

**Olivier Gregoire, Licensing Manager, Moltex said:**

*“We appreciate the opportunity to get early feedback on the design from the CNSC to ensure we are designing a facility that meets the highest standards. Early engagement minimizes the risk of late stage additions to the design which can create needless cost increases. This engagement will streamline site specific licensing.”*

To explore how WATSS can transform nuclear waste management, download the full report [here](#).

### About Moltex

Moltex is an Intellectual Property company and nuclear technology leader at the forefront of developing breakthrough technologies for nuclear energy. These include the Stable Salt Reactor – Wasteburner (SSR-W) which uses recycled nuclear waste as fuel; a Waste To Stable Salt (WATSS) process for recycling nuclear waste to produce new fuel; and GridReserve thermal energy storage tanks, which enable the SSR-W to act as a peaking plant.

Moltex was selected by NB Power to progress the development of its reactor technology in New Brunswick, Canada, with the goal of deploying first-of-a-kind SSR-W, WATSS and GridReserve units at the Point Lepreau site.

### Media Contact:

Betty Draper



**Moltex**  
[bettydraper@moltexenergy.com](mailto:bettydraper@moltexenergy.com)

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew s.19(1)  
**Sent:** July 7, 2025 4:11 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: Moltex - CNSC agreement  
**Attachments:** Moltex - CNSC agreement.docx

**Importance:** High

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** April 7, 2025 2:19 PM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <Daniel.Duchesne@cnscccsn.gc.ca>; Belyea, Sean <Sean.Belyea@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Cc:** Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>  
**Subject:** FW: Moltex - CNSC agreement  
**Importance:** High

Hello there,

Please see attached a draft press release from Moltex on the topic of Moltex initiating pre-licensing review thru a service agreement signed with the CNSC. Per, Moltex this press release is expected to be released next Monday.

**If you have any comments, please send it to me by Close of Day April 10<sup>th</sup>, 2025.**

Julian

---

**From:** [REDACTED] <[REDACTED]@moltexenergy.com>  
**Sent:** April 7, 2025 2:06 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Subject:** Moltex - CNSC agreement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hello Julian,

As suggested when the agreement was negotiated, we intend to publicly acknowledge the signature of the SLA with the CNSC on WATSS, as well as the engagement with the IAEA. Here is the proposed wording of the announcement, expected to be released next Monday.

Best regards

[REDACTED]



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)



## Moltex Energy Initiates Pre-Licensing Review of WATSS Technology with CNSC

**Saint John, NB, 14 April 2025** – Moltex Energy Canada Inc. (Moltex) has recently entered into a Service Level Agreement with the Canadian Nuclear Safety Commission (CNSC) in relationship to the development of the WASTE To Stable Salt (WATSS) process.

This agreement lays out a framework for engagement and discussions with the regulator to receive feedback on key topical areas such as safeguards, safety and security, to ensure that regulatory requirements are suitably taken into account at every stage of the development.

This framework will in turn allow the CNSC to facilitate engagement with the International Atomic Energy Agency (IAEA) to guarantee that the WATSS facility and associated fuel cycle will be compatible with the application of international obligations under the Non-Proliferation Treaty, and ensure best practises are incorporated into the design as early as possible.

Moltex has recently validated the WATSS process with used CANDU fuel and is now progressing with the engineering design and safety analysis of the commercial facility.

### **Olivier Gregoire, Licensing Manager, Moltex said:**

*“We appreciate the opportunity to get early feedback on the design from the CNSC to ensure we are designing a facility that meets the highest standards. Early engagement minimizes the risk of late stage additions to the design which can create needless cost increases. This engagement will streamline site specific licensing.”*

### **Rose Robinson, NB Power said:**

*“NB Power is keen to support Moltex through this pre-licensing process so we can be better informed as a potential licensee of a WATSS facility. The Moltex technologies have the potential to significantly reduce high level waste volumes and increase energy security by recycling the used fuel at the Point Lepreau site.”*

To explore how WATSS can transform nuclear waste management, download the full report [here](#).

### **About Moltex**

Moltex is an Intellectual Property company and nuclear technology leader at the forefront of developing breakthrough technologies for nuclear energy. These include the Stable Salt Reactor – Wasteburner (SSR-W) which uses recycled nuclear waste as fuel; a Waste To Stable Salt (WATSS) process for recycling nuclear waste to produce new fuel; and GridReserve thermal energy storage tanks, which enable the SSR-W to act as a peaking plant.

Moltex was selected by NB Power to progress the development of its reactor technology in New Brunswick, Canada, with the goal of deploying first-of-a-kind SSR-W, WATSS and GridReserve units at the Point Lepreau site.



**Media Contact:**

Betty Draper

Moltex

[bettydraper@moltexenergy.com](mailto:bettydraper@moltexenergy.com)

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew  
**Sent:** July 7, 2025 4:12 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: Situational Awareness Update - Reprocessing

---

**From:** McAllister, Andrew  
**Sent:** July 25, 2024 3:29 PM  
**To:** Maric, Olga <olga.maric@cnscccsn.gc.ca>  
**Cc:** Amalraj, Julian <julian.amalraj@cnscccsn.gc.ca>  
**Subject:** RE: Situational Awareness Update - Reprocessing

Hi Olga,

Nice speaking to you today.

Here are some bullets for your consideration on reprocessing in general and Moltex specifically:

- An Interdepartmental Working Group has been established by NRCAN to undertake analyses that could inform policy makers in the future
- CNSC has aligned its SMR readiness work on reprocessing to that of the NRCAN Working Group
- Moltex continues with studies regarding its reprocessing technology
- A service agreement between Moltex and the CNSC with a focus on safeguards related to its reprocessing technology, is going through CNSC's internal approvals process
- Unlikely to have an application for such a facility in Canada for a number of years

As I mentioned, Julian will be the NPDF PoC while I am away if you have any follow up.

Cheers,

Andrew

---

**From:** Maric, Olga <olga.maric@cnscccsn.gc.ca>  
**Sent:** Wednesday, July 24, 2024 8:27 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** Situational Awareness Update - Reprocessing

Good morning Andrew,

CPD leads in the development of a situational awareness brief to ET (and this time as a brief for the new president as well), which highlights various nuclear projects (current and future) and how and when they are likely to impact us. We also talk to some policy related aspects. To gather information on various projects, we have a quarterly meeting with several key individuals across the CNSC to provide updates – during this meeting it was suggested that you would be able to provide some additional information as it pertains to the Moltex Reprocessing facility, someone had mentioned that there was maybe some movement on this front.

Below is the information we have gathered over the last few quarters on this topic, are there any updates that you could provide that should be included in the deck to ET? I am happy to have a call to explain further what Situational Awareness is, and answer any questions you may have. In addition, the group of participants in this work seems to be growing slowly as we get more details to projects – we have some representatives from DNCFR (Nhan and Patrick), but if you feel you should be attending as well, I am happy to add you to the next update meeting.

<p><u>Moltex</u> SMR &amp; Reprocessing Facility</p>	<p>Likely just noise.</p> <p><b>Comment from Adam:</b> Not clear on why this is scratched out? The Government of NB and Canada have invested in <u>Moltex</u> and they have offices in NB. From my understanding there will be an application for a <u>Moltex</u> reactor at Point Lepreau in the next year or two.</p> <p>Current studies being undertaken to prove its worth – and will likely push for inclusion in the nuclear technology that may be used. Acceptance by government policy on reprocessing.</p> <p>This project is likely outside of a <u>5 year</u> timeframe.</p> <p>Interdepartmental working group stood up to inform policy makers down the road – <u>NRCAN</u> looking for end of year deliverable.</p> <p>No immediate plans to proceed – kind of on hold.</p>	<p>No movement McAllister to side.</p>
--	--	--

Best regards,  
Olga

**Olga Maric**  
(she/her/elle)

Senior Corporate Planning Advisor | Conseillère principale en planification de l'organisation  
Strategic Planning Directorate | Direction de la planification stratégique  
Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire  
[Olga.maric@cnsccsn.gc.ca](mailto:Olga.maric@cnsccsn.gc.ca) / Tel: 613-301-0496

**Pages 4233 to / à 4234  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**19(1), 20(1)(b), 21(1)(a)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

## Hautfenne-Jewer, Celia

---

**From:** McAllister, Andrew s.19(1)  
**Sent:** July 7, 2025 4:11 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: WATSS results and announcement  
**Attachments:** Moltex WATSS Brochure Mar 03 2025.pdf; Moltex WATSS Web release v1.docx

**Importance:** High

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** February 27, 2025 2:21 PM  
**To:** Kanasewich, Elaine <Elaine.Kanasewich@cnscccsn.gc.ca>; Gao, Henry <Henry.Gao@cnscccsn.gc.ca>; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Belyea, Sean <Sean.Belyea@cnscccsn.gc.ca>; Vary, Beth <beth.vary@cnscccsn.gc.ca>; Duchesne, Daniel <Daniel.Duchesne@cnscccsn.gc.ca>; Cochrane, Chris <chris.cochrane@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Hamlat, Said <Said.Hamlat@cnscccsn.gc.ca>; Posada, Lester <lester.posada@cnscccsn.gc.ca>; Steedman, Gavin <gavin.steedman@cnscccsn.gc.ca>; Khotylev, Vladimir <Vladimir.Khotylev@cnscccsn.gc.ca>  
**Cc:** Sigouin, Luc <Luc.Sigouin@cnscccsn.gc.ca>; Burton, Patrick <Patrick.Burton@cnscccsn.gc.ca>  
**Subject:** FW: WATSS results and announcement  
**Importance:** High

Hello There,

Copying Moltex communication regarding a press release scheduled for next Monday. I am also copying key directorate personnels working on reprocessing.

If you have any comments please let me know by end of day February 28, 2025.

Please note information is not be shared or mentioned outside of concerned personnel atleast till next Monday.

---

**From:** [REDACTED]@moltexenergy.com>  
**Sent:** February 27, 2025 2:11 PM  
**To:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Cc:** [REDACTED]@moltexenergy.com>  
**Subject:** WATSS results and announcement

---

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

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Hello Julian,

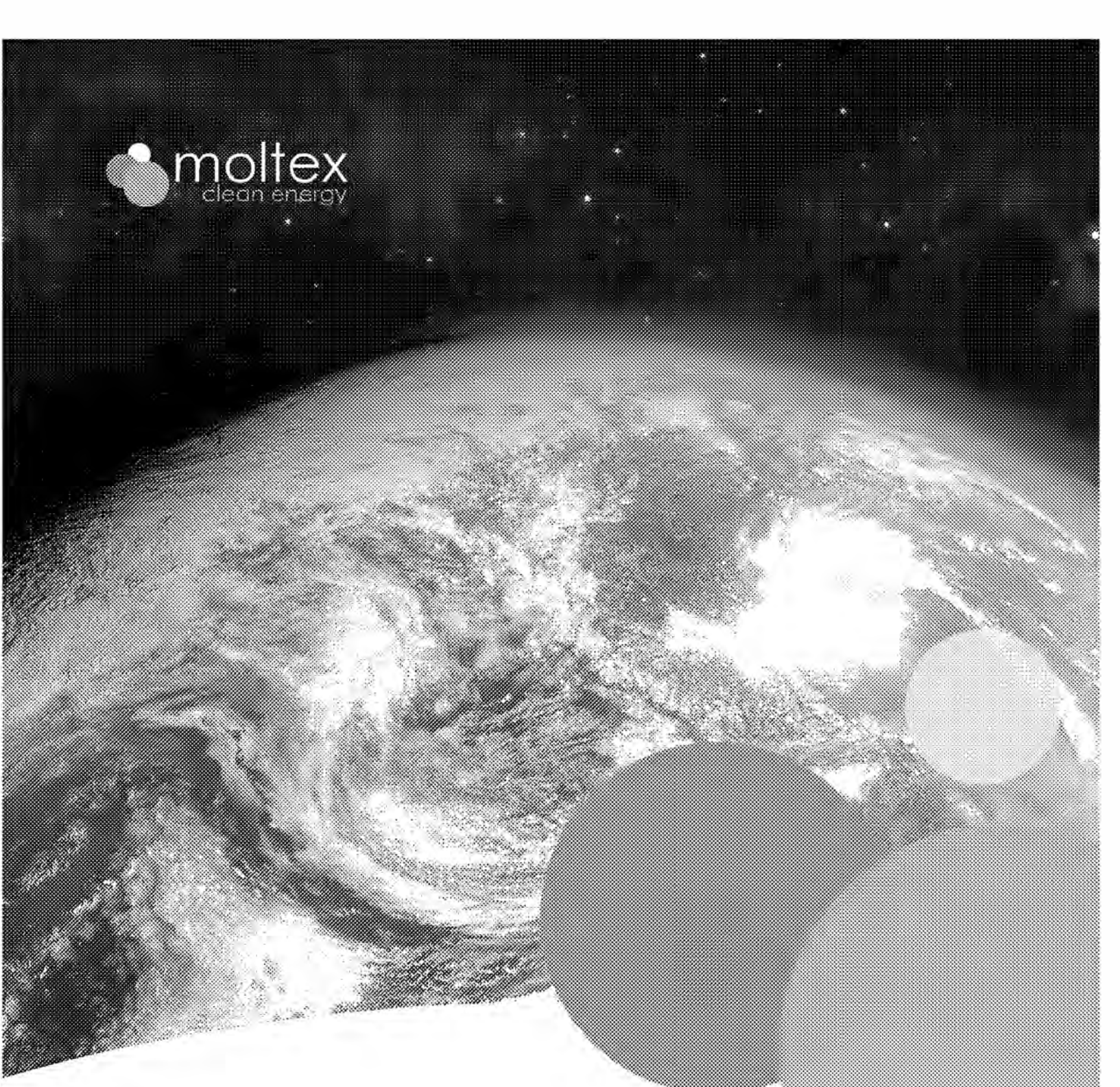
For your information, we will publicly release a brochure describing WATSS on Monday next week, together with a press statement referring to the test results we have recently obtained from the experiments at Chalk River with spent fuel pellets.

Fell free to distribute to relevant CNSC personnel, keeping in mind an embargo until Monday.

Best regards



Moltex Energy  
200 Carmarthen street • Saint John • New Brunswick • Canada • E2L 2P7  
+1 506 214 8551 • [info@moltexenergy.com](mailto:info@moltexenergy.com) • [www.moltexenergy.com](http://www.moltexenergy.com)



MARCH 3, 2025

# Unlocking the Future of Nuclear Fuel Recycling

The Waste to Stable Salt Solution



## The Waste to Stable Salt Solution

The Waste To Stable Salt (WATSS) process is a groundbreaking nuclear waste recycling technology designed with versatility and efficiency in mind. Developed by Moltex Energy, a leader in advanced nuclear technology, the WATSS process reduces waste liabilities while unlocking unmatched value from existing fuel resources.



**The Waste To Stable Salt process recycles used nuclear waste into fuel.**

### The WATSS advantage

- Simple, reliable, and widely compatible used fuel recycling process
- Commercially and economically viable alternative to conventional recycling and disposal strategies
- Delivers greater energy security and fuel independence
- Reduces waste volumes

Alone, WATSS delivers major reductions in nuclear waste volume. When paired with Moltex's Stable Salt Reactor – Wasteburner (SSR-W), the recycled fuel can be converted into clean energy, while permanently destroying long-lived transuranic elements, including plutonium—the ultimate closed fuel cycle.





## Message from the Chairman and CEO

The world today stands at a pivotal juncture, requiring both clean and affordable energy as we grapple with the pressing challenges of climate change. This complex equation demands innovative solutions capable of combining both environmental sustainability and economic viability. With WATSS, we have solved that equation by creating a simple and cost-efficient technology that transforms used nuclear fuel into a valuable energy asset.

WATSS transforms nuclear waste into an asset, providing a cost-effective, adaptable, and safe pathway for waste owners to reduce long-term liabilities while enhancing energy security. For industry leaders seeking practical solutions to long-lived waste challenges, WATSS delivers immediate impact and a future-proof strategy for nuclear fuel management.

Building on seven years of rigorous testing and development, Moltex has successfully validated WATSS using real used nuclear fuel pellets, marking a step change in the viability of closing the nuclear fuel cycle with a practical and scalable solution.

Turning your nuclear waste into an asset is possible with WATSS. Step into the future of nuclear waste management with Moltex.



Rory O'Sullivan  
*Chief Executive Officer*



José Emeterio Gutiérrez  
*Chair, former CEO, Westinghouse*

# The Science Behind WATSS

Unlike traditional methods, WATSS extracts valuable materials and radioactive byproducts in a single, streamlined 24-hour chemical process, significantly reducing waste volumes and creating a valuable energy asset.

Made up of one pre-treatment phase followed by three main treatment stages, the WATSS process extracts transuranic elements directly into molten salt, significantly streamlining the fuel cycle. Designed for universal compatibility, it is capable of processing all commercial reactor fuels—as well as historical research and advanced reactor fuels.

## Pre-treatment

After arriving at the WATSS facility, which is preferably co-located with existing nuclear power plants to minimize transportation requirement and associated risk, used fuel is stripped of its cladding. During pre-treatment, the irradiated oxide fuel is subjected to a sequence of controlled oxidation and reduction steps. This process reduces the particle size of the oxide matrix and adjusts its oxidation state to the level required for subsequent processing, all according to the Oxidation-Reduction of Oxides (OREOX) process.

## Stage one

In stage one, transuranic elements are separated from uranium through direct extraction into a molten salt. The controlled addition of a reducing metal converts the transuranic elements into a salt-soluble species—either trichlorides or oxychlorides—while uranium remains as an insoluble dioxide phase.

From this stage, different processing pathways can be applied to produce various fuel types.

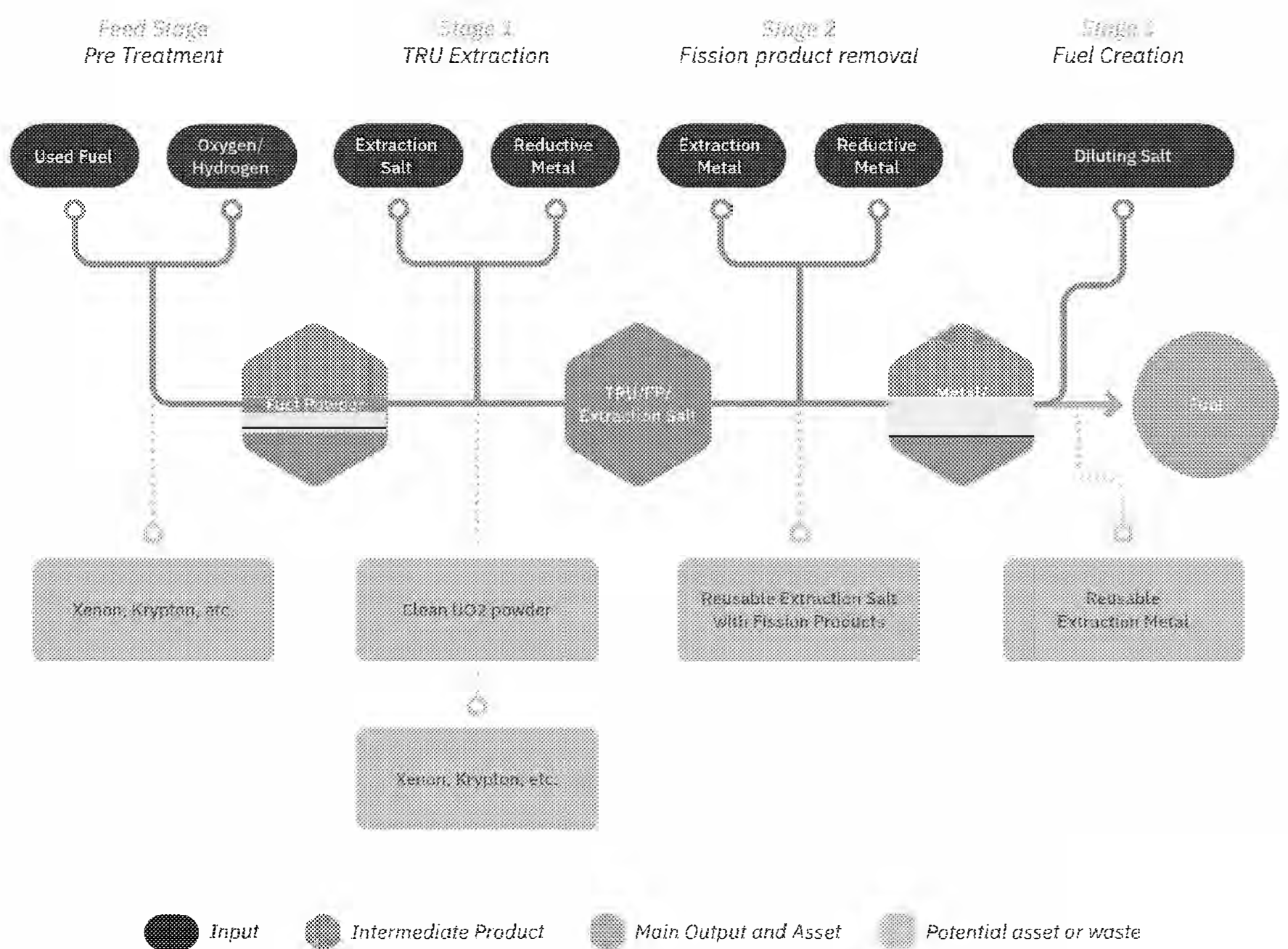
## Stages two and three

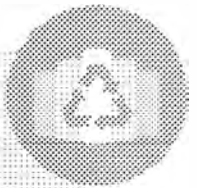
In stages two and three of the WATSS process, the extracted transuranic elements are concentrated to produce molten salt fuel, while separating out the fission products. The actinides are first reduced in liquid bismuth, followed by chlorination with bismuth chloride in the presence of magnesium chloride. This yields a magnesium chloride-based salt infused with actinide trichlorides, serving as a precursor for reactor fuel salt.

For use in molten salt reactors, precursor salts with precisely characterized elemental and isotopic compositions are stored and blended to achieve the desired actinide ratio. Conventional salts are then added to reach the eutectic point, tailored to the specific reactor's requirements and producing either chloride- or fluoride-based fuel salts.

A demonstration of flowing molten salt.



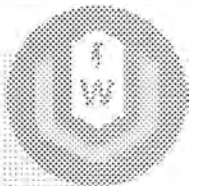




## What used fuels can WATSS recycle?

The WATSS process is designed to treat used nuclear fuels in oxide form, including CANDU, Light Water Reactor (LWR), and certain fast reactor fuels, such as mixed oxide (MOX) fuels. The Moltex fuel pretreatment process is highly versatile and can accommodate exotic, experimental, or advanced reactor fuels, including metallic, nitride, carbide, and silicide fuels.

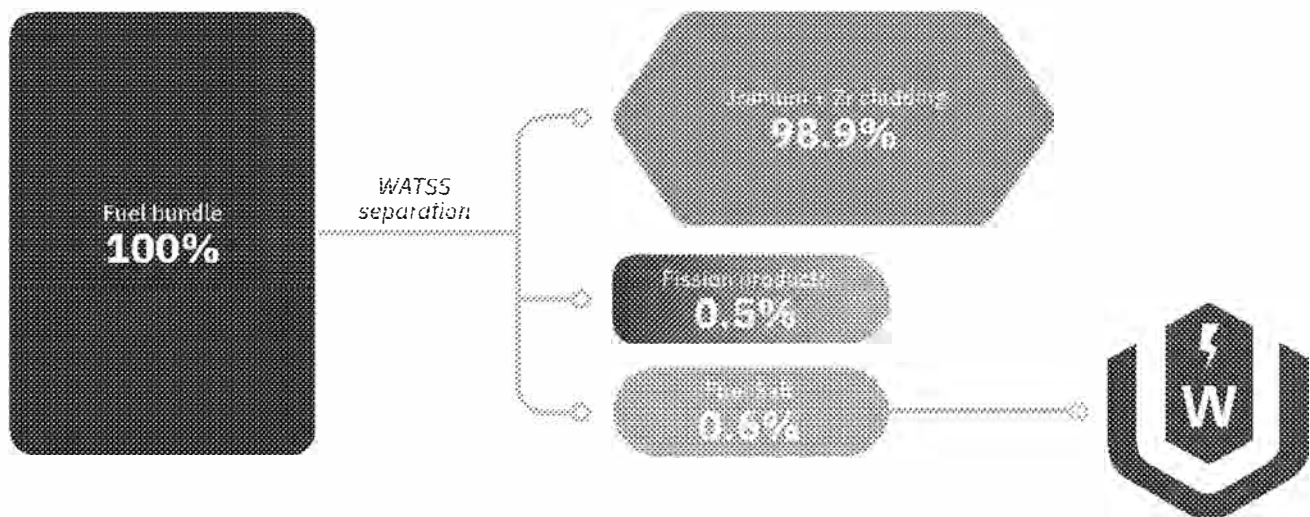
Together, the WATSS process and the SSR-W create a closed fuel cycle. WATSS and the SSR-W can infinitely recycle used MOX fuel, continuously extracting transuranic elements for reuse and preventing their accumulation in waste streams.



## What fuels does the WATSS process create?

WATSS, as currently designed, produces fuel for molten salt reactors in either chloride or fluoride form. Stages two and three of the process developed by Moltex converts separated actinides into a new salt fuel, initially in the form of solid pellets for ease of handling and transportation.

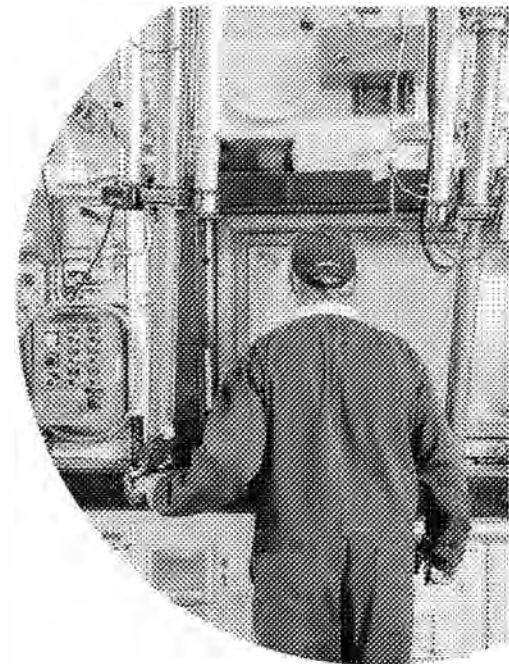
This process is adaptable and can be optimized to meet the specific fuel requirements of different molten salt reactor configurations. For instance, with further development, WATSS-derived fuel could serve as a practical alternative to high-assay low-enriched uranium (HALEU), offering customized solutions for reactor developers seeking reliable, high-quality fuel sources.



-----◇ Process    ■ Long-lived waste    ▨ Intermediate-level waste    ▨ Potential reuse



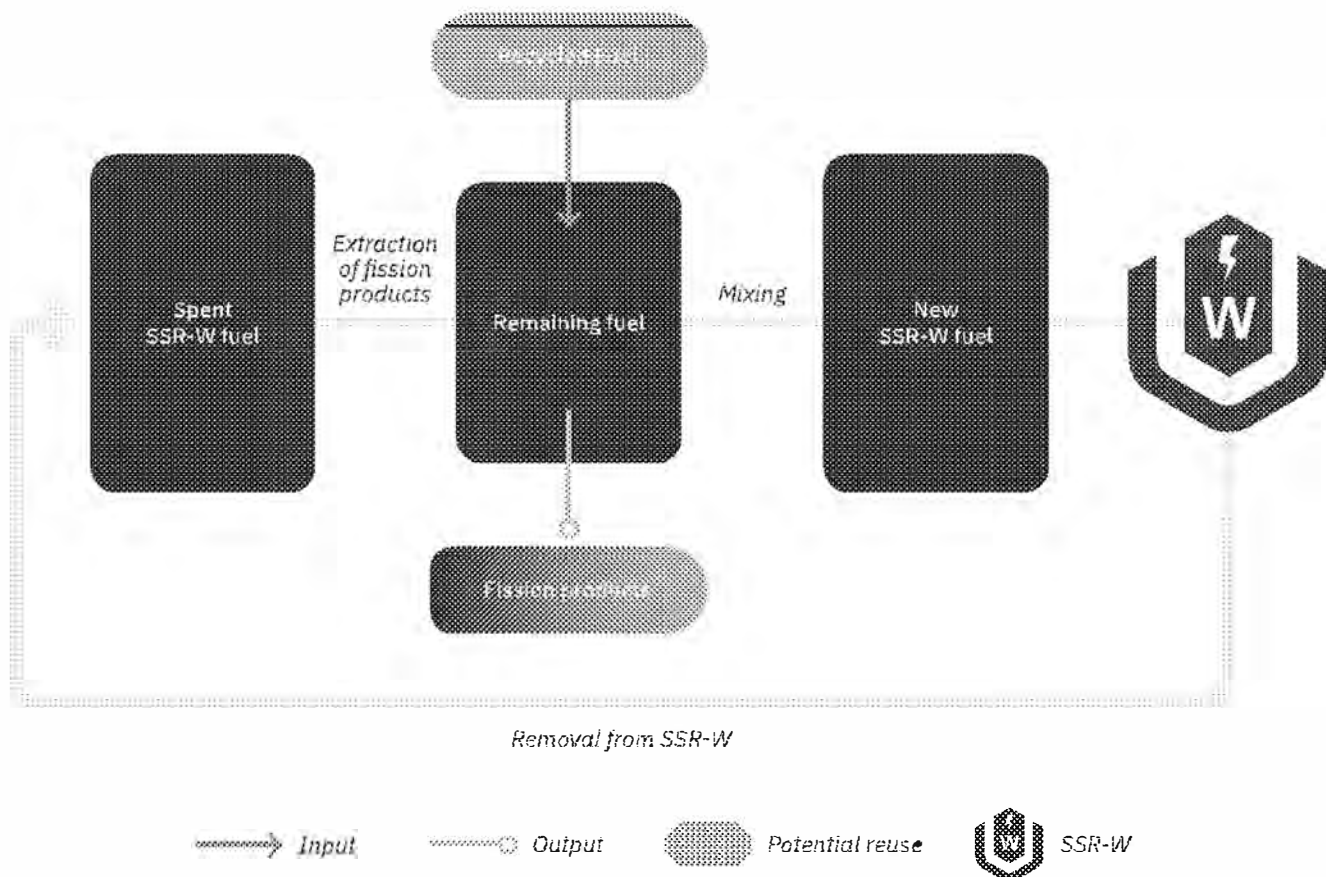
# Long-term energy potential combined with immediate waste reduction



## Potentially endless energy potential

Combined with Moltex's SSR-W reactor, which is specifically designed to destroy all man-made long lived radioactive elements, the WATSS process enables continuous recycling and energy generation.

In practical terms, the used fuel from the current fleet of nuclear reactors in the United States could power at least 25,000 MW of SSR-Ws for 60 years. At the end of their lifecycle, the only remaining transuranic waste would be the used fuel sitting in the core of these reactors, which could be used to start new reactors, enabling continuous recycling. Looking to the future, instead of presenting a disposal challenge, additional nuclear waste from potential new nuclear power plants, would be an opportunity to generate even more clean energy.



## Enhancing supply security and environmental sustainability

Recycling existing used fuel through WATSS provides a stable and predictable supply of fissile material, insulating reactor operators from uranium market fluctuations. As the nuclear renaissance progresses, the volume of available used fuel is expected to grow, further enhancing supply security.

Beyond economic and supply considerations, multiple studies have highlighted the environmental impact of mining lower-grade uranium ores and the emissions associated with fuel enrichment.<sup>1</sup> By eliminating the need for fresh uranium mining and enrichment, WATSS removes these environmental impacts entirely, making nuclear energy even more sustainable.

## Minimizing nuclear waste

The WATSS process has the potential to halve the footprint of a required repository, while supporting fast reactors that generate 50% more energy without additional fuel needs or repository expansion. Over its 60-year lifetime, a 500 MW electricity generating SSR-W can destroy approximately 25 metric tons of actinides.<sup>2</sup>

By removing most heat-generating isotopes and utilizing interim storage, the majority of used fuel recycled through the WATSS process qualifies as Intermediate Level Waste. This classification enables more efficient canister filling, optimizing storage capacity. As a result, the final repository footprint for this type of waste stream is approximately three times less than that required for direct disposal of used fuel.

Recovered transuranic elements can serve as fuel in advanced reactors, generating substantial energy while simultaneously eliminating long-lived radioactive isotopes. Other elements and isotopes present in the spent fuel can also be valuable and be extracted for industrial and medical applications, transforming waste liabilities into usable assets.

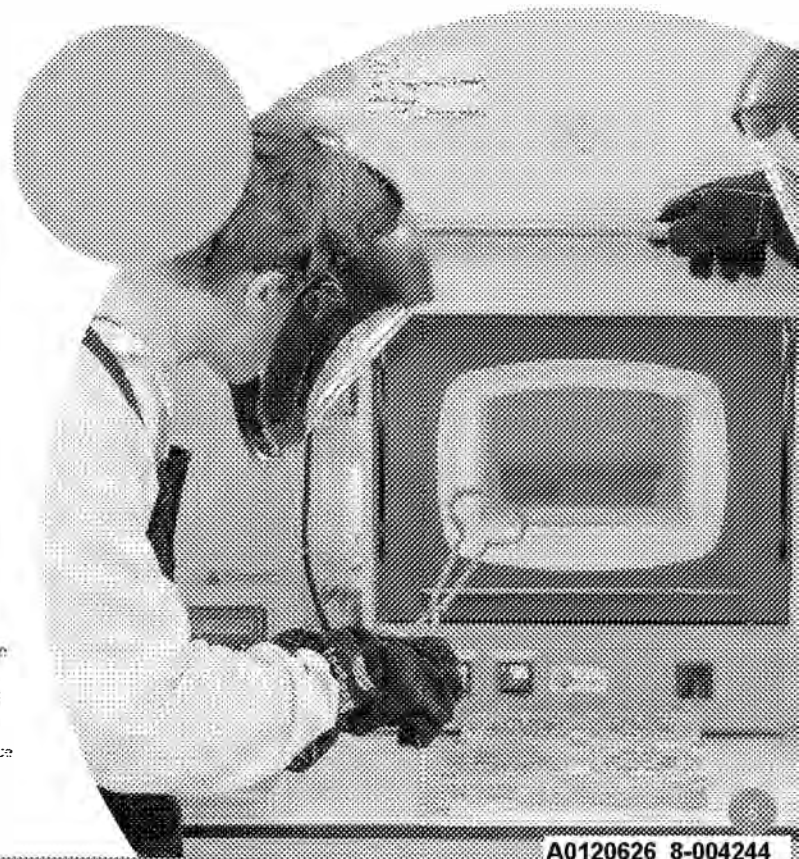
The remaining high-level waste represents roughly 3% of the initial used fuel mass and about 5% of its volume. After stabilization, this material can be safely disposed of in a Deep Geological Repository, yielding a smaller overall repository footprint than an open fuel cycle without recycling.

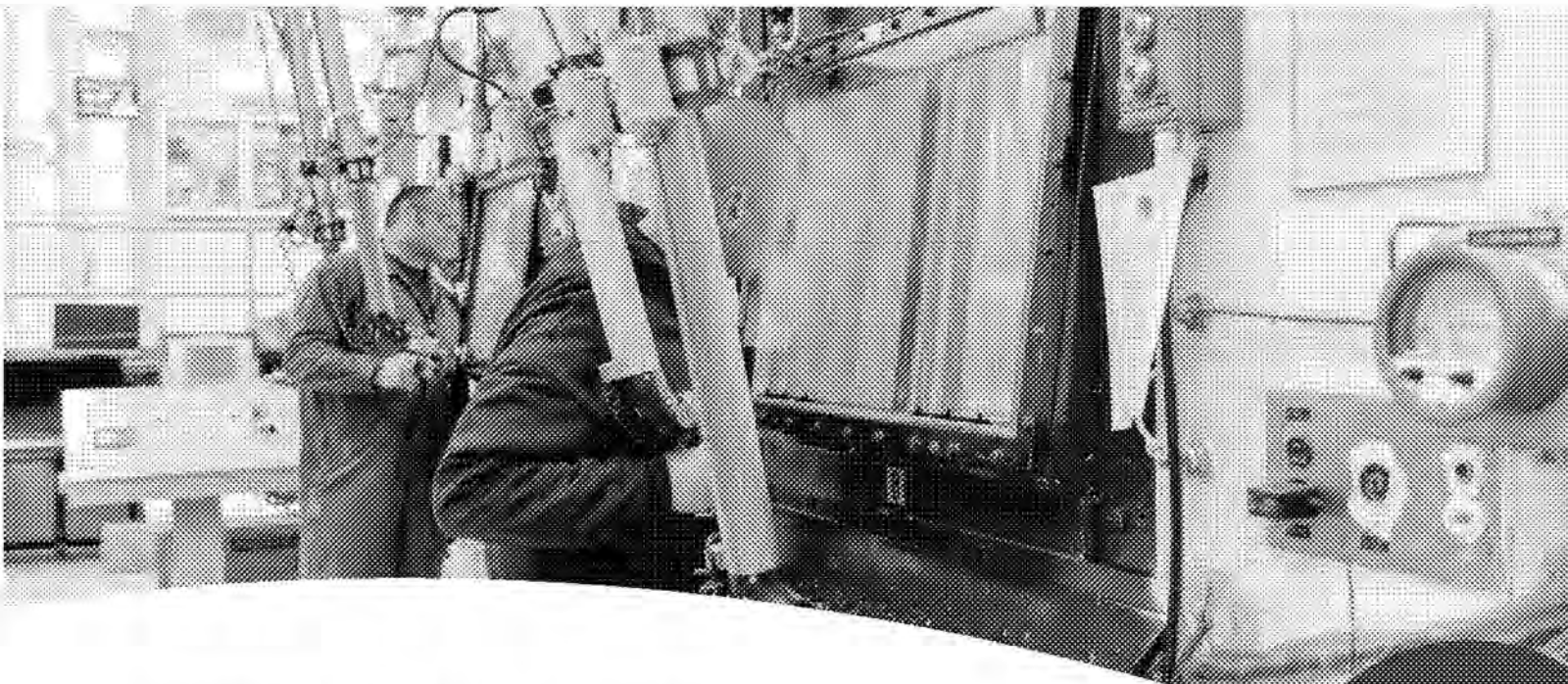
In countries lacking a centralized national repository, or as a complementary solution, the relatively low volume of high-level waste makes Deep Borehole Disposal (DBD) a viable option, even for non-stabilized waste. DBD offers exceptional long-term isolation, ensuring superior safeguards against both deliberate and accidental access.

<sup>1</sup>E. Schneider, B. W. Carlson & E. Tsvendis, "Requires of the Environmental Footprint of the Front-End of the Nuclear Fuel Cycle," IAEA, ECF-13-00493, 2010.

<sup>2</sup>T. Nargate, K. Haque, P. Seltzer, "The impact of uranium ore grade on the greenhouse gas footprint of nuclear power," Journal of Cleaner Production, 2014, 84, 360-367.

<sup>3</sup>J. Taylor, G. Gregoire, P. Haigh, S. Boddington & R. O'Sullivan, "Waste Burning Performance of the Metrex SSR-W," 5th Generation IV and Small Reactors (GASR) Conference, 2024.





## Inherently proliferation resistant

Historically, concerns around used fuel recycling and reprocessing have centered on the separation of plutonium, which can potentially be diverted for military use.

Molten salt reactors do not require this separation, and the WATSS process fundamentally prevents it, as all transuranic elements are managed collectively without the ability to isolate plutonium.

More importantly, WATSS not only enables continuous recycling but also the destruction of plutonium and other transuranic elements through the waste-burning reactor. This ensures that weapons-usable material is permanently eliminated, neutralizing proliferation concerns, regardless of future technological advancements.



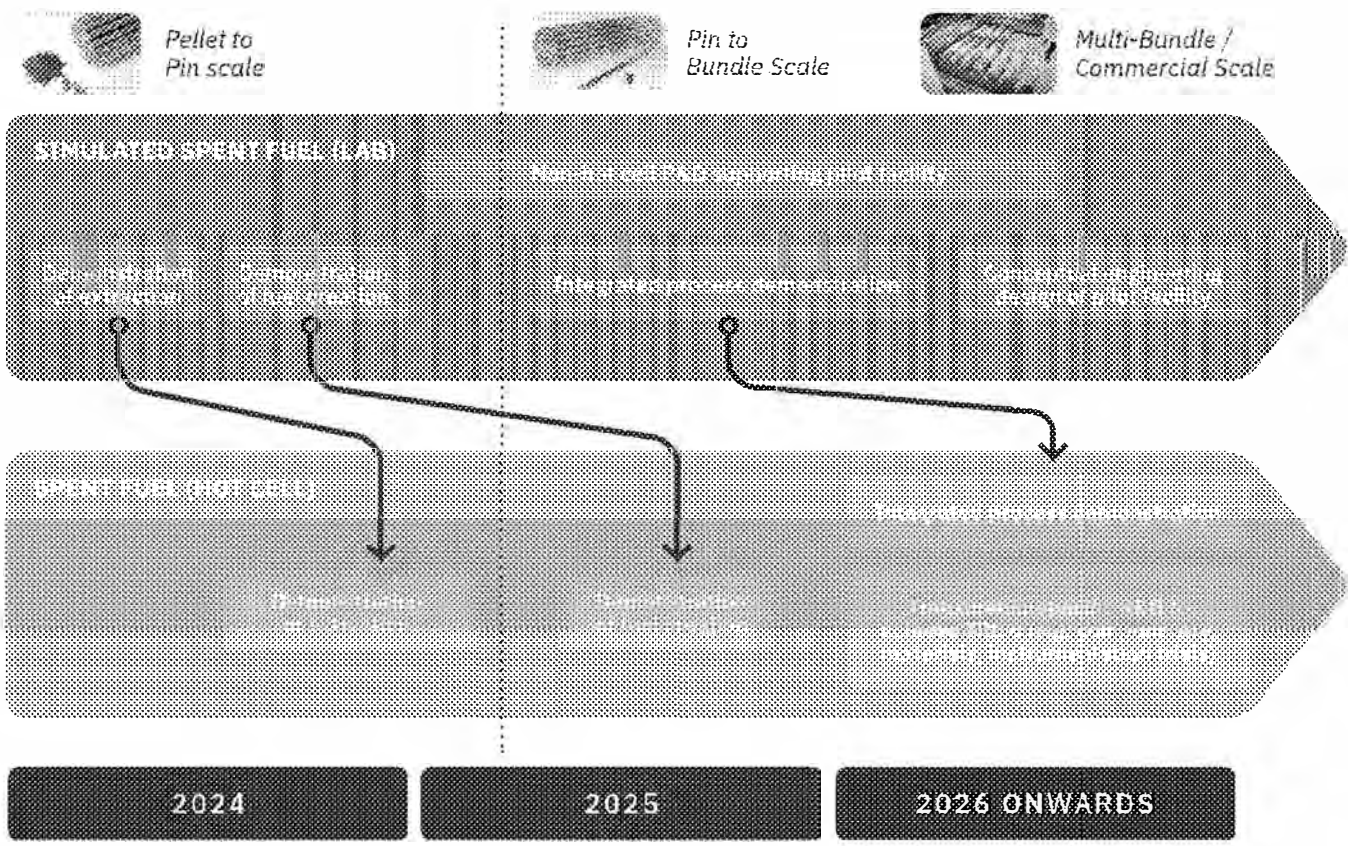
# A proven breakthrough

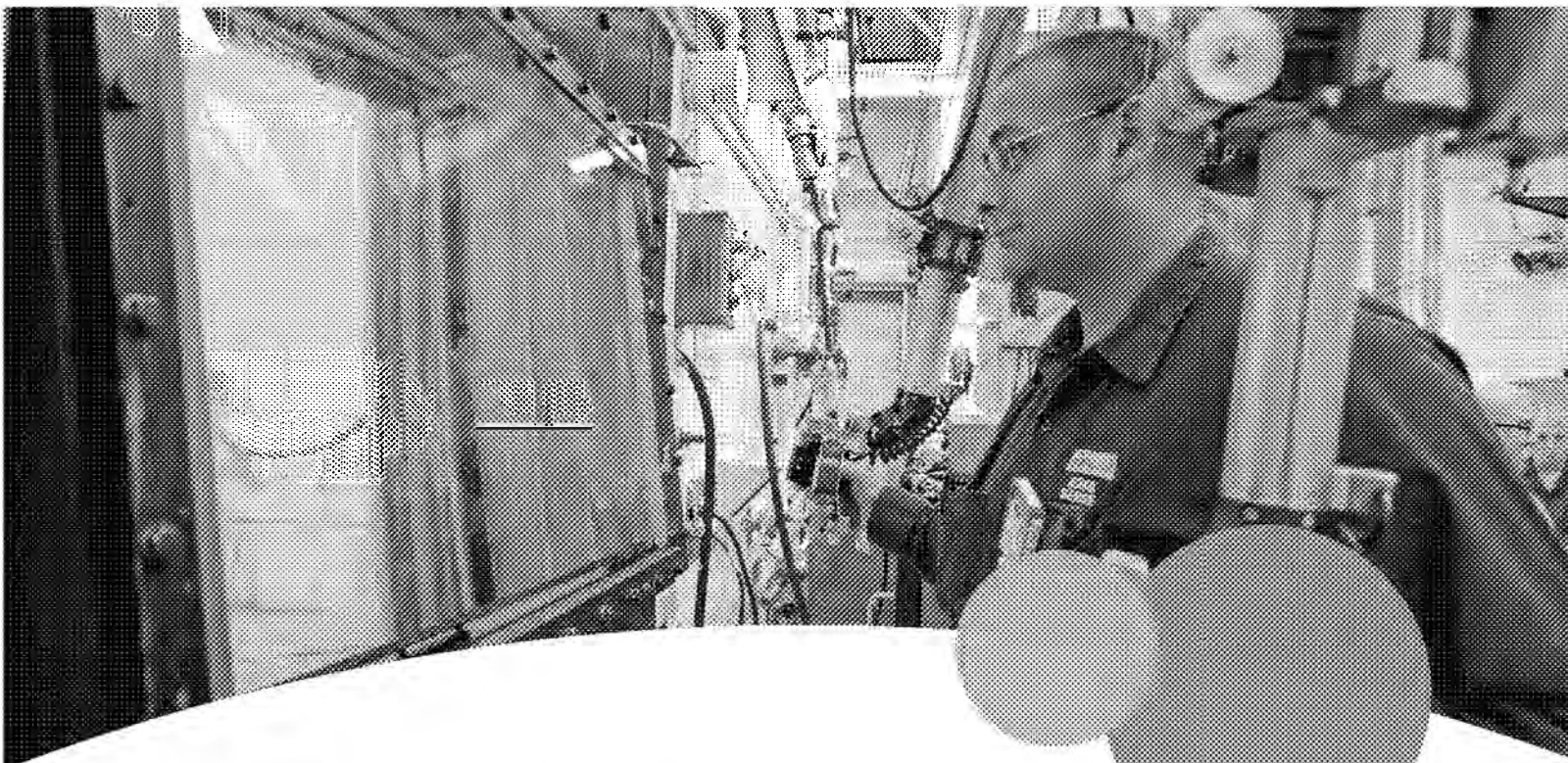
Driven by a bold vision to revolutionize used nuclear fuel management, Moltex has been at the forefront of developing a groundbreaking recycling process for seven years. Through rigorous testing and development, we pursued a solution that could go beyond conventional recycling methods and redefine nuclear waste recycling. WATSS stands apart as the first entirely new technology developed in over three decades and the first ever created by a private enterprise.



In early 2025, through work executed by the Canadian Nuclear Laboratories (CNL)—the only institution in Canada equipped to handle used nuclear fuel—Moltex achieved a pivotal milestone: the successful demonstration of the WATSS process at pellet scale with real used nuclear fuel. This groundbreaking achievement validated WATSS's ability to extract the majority of valuable transuranic material from used nuclear fuel with unparalleled efficiency.

Before reaching this milestone, Moltex dedicated four years to exploring and trialing reprocessing technologies widely regarded in the industry as the most promising solutions, including pyroprocessing and electrorefining. None could deliver in the same way that the WATSS process does on efficiency, proliferation resistance, or cost-effectiveness.





## Backed by leading authorities

Independent assessments by experts Robert Holmes, former Chief Scientist, Canadian Nuclear Laboratories and British Nuclear Fuels and Adrian Simper, former Chief Scientist of the UK Nuclear Decommissioning Authority and Chief Nuclear Advisor to the UK government, have been influential in assessing the technology's viability and readiness.

*"The WATSS process [...] is based on demonstrated science and reflects established custom and practice for radiochemical plants [...] The science both of individual process steps and the way they are combined, appears sound."*

— Adrian Simper and Robert Holmes

Engineering partners, IDOM, and Candu Energy Inc., an AtkinsRéalis company, have provided critical expertise in advancing this groundbreaking process from concept to demonstration.

The development of WATSS has been made possible by CNL's Canadian Nuclear Research Initiative, and through the generous financial support of Canada's Strategic Innovation Fund, Atlantic Canada Opportunities Agency, the Province of New Brunswick, Ontario Power Generation, and Canadian Nuclear Laboratories as well as investors, IDOM, Candu Energy Inc, North Shore Mi'kmaq Tribal Council, and many other private individuals

**IDOM**

**Candu**  
An AtkinsRéalis company



Canadian Nuclear  
Laboratories

Laboratoires Nucléaires  
Canadiens

**NORTH SHORE**  
Mi'kmaq Tribal Council

# Pathway to full-scale operations

Over the next two years, Moltex intends to continue to expand its simulated used fuel operations, while refining and optimizing the integrated WATSS process, demonstrating its scalability to a variety of different contexts and ensuring a seamless transition to commercial deployment. This will include the development of a large-scale simulated fuel version of the entire WATSS process as well as larger integrated rig that uses real used fuel. The latter will be housed in a shielded hot cell facility that has yet to be selected.

In partnership with New Brunswick Power, Moltex plans to build a commercial-scale demonstration facility at the Point Lepreau Nuclear Generating station site. The facility will recycle an anticipated 260,000 used fuel bundles from the existing CANDU reactor and create recycled fuel for the entire 60-year lifespan of one 300MW demonstration Stable Salt Reactor-Wasteburner.

Future WATSS facilities will be designed with flexibility in mind, optimized to meet the unique requirement of different jurisdictions and customers, while also balancing cost-efficiency resulting from scaling up the technology's deployment. Funding for these activities is anticipated to come from a combination of private financing, government funding, and customer financing through a consortium of end-users.

This collaborative and iterative approach provides an unprecedented opportunity for customer and end-users to shape the development of the technology, ensuring it aligns with their specific needs. From facility design to process optimization, your input will be invaluable in guiding WATSS toward solutions tailored to your operations.

Experience the future of nuclear recycling with Moltex's groundbreaking WATSS technology. Join us in pioneering a revolutionary approach to nuclear waste management, tailored to your vision.



Point Lepreau: A national project in New Brunswick



Rendering of Point Lepreau site layout



This brochure is published by Moltex Energy Canada Inc., an intellectual property developer and nuclear technology leader. Headquartered in Canada with development activities across Canada, the UK, and the USA, Moltex has a portfolio of patents on both nuclear waste recycling and molten salt reactor technologies. Moltex is a proud partner of NB Power, working alongside the utility to advance reactor technology in New Brunswick Canada, with the goal of deploying first-of-a-kind nuclear recycling and energy conversion technologies.

#### FOR FURTHER INFORMATION

Visit [moltexenergy.com](http://moltexenergy.com)

Contact [info@moltexenergy.com](mailto:info@moltexenergy.com)

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## Moltex WATSS – Website Version

Embargoed until 0630 ET, Monday 3 March 2025

### Moltex Energy Achieves Breakthrough in Nuclear Fuel Recycling with WATSS Technology

**Saint John, NB, 3 March 2025** – Moltex Energy Canada Inc. (Moltex) is shaking up nuclear waste management with its revolutionary Waste to Stable Salt (WATSS) process. This innovative technology is set to transform nuclear waste management by providing economically viable solutions, addressing one of the biggest challenges facing the nuclear sector as it responds to increased global demand.

Moltex has successfully validated WATSS on used fuel bundles from a commercial reactor in Canada through state-of-the-art hot cell experiments executed by Canadian Nuclear Laboratories marking a pivotal moment in closing the nuclear fuel cycle and advancing next-generation nuclear sustainability.

#### WATSS: A Game-Changer for Nuclear Energy

The WATSS process marks a significant leap forward by converting used nuclear fuel into an asset through an efficient 24-hour chemical process. Moltex has demonstrated that it can extract 90% of the transuranic material in 24-hours, with greater efficiency over longer periods of time.

This advancement not only vastly reduces nuclear waste volumes but also unlocks fresh economic opportunities for waste owners and utilities —options previously deemed unfeasible because of financial constraints and the availability of waste management capabilities following nuclear’s increased role in the global energy mix. With 66 reactors currently under construction and more than 80 SMR designs being progressed across the world, WATSS offers a financially attractive pathway to managing higher waste volumes more sustainably.

#### Rory O’Sullivan, Chief Executive Officer, Moltex said:

*“It’s crucial that increased demand for nuclear energy is matched by increased back-end fuel cycle capabilities. WATSS is a transformative solution that not only reduces liabilities but also adds value, turning waste into a valuable energy asset.”*

#### Global Solutions to Nuclear’s Waste Challenge

WATSS provides a robust, commercially viable alternative to conventional direct disposal methods. By coupling WATSS with Moltex’s Stable Salt Reactor – Wasteburner (SSR-W), the technology not only reduces waste volumes dramatically but also transforms nuclear waste into clean, dispatchable energy, permanently eliminating long-lived transuranic elements like plutonium. WATSS can produce fuel for other reactor types also.

#### Unlocking Investment

The development of WATSS, supported by entities such as the Government of Canada, Province of New Brunswick, NB Power, and Ontario Power Generation, underscores the confidence in its potential to revolutionize the industry. Moltex’s collaboration with



engineering partners like IDOM and CANDU Energy Inc., an AtkinsRéalis company, showcases the extensive expertise backing the technology.

Indigenous communities in New Brunswick are also supportive of the technology having invested in its development.

**Jim Ward, General Manager, North Shore Mi'kmaq Tribal Council said:**

*“Our investment in Moltex was driven by the potential to make nuclear more sustainable and reduce nuclear waste liability. Moltex also engaged with us at the earliest stages of the project. We are pleased to see this important milestone being met and look forward to more to come.”*

**Enhancing Value through Consultancy Services**

In addition to its technological breakthroughs, Moltex is offering consultancy services that present nuclear waste owners with essential solutions to assess and mitigate their liability risks effectively. This service is crucial for waste owners seeking expert guidance to navigate and explore whether their used fuel liabilities can be turned into an asset.

To explore how WATSS can transform nuclear waste management, download our full report: [\[give link\]](#)

**Media Contact:**

Betty Draper  
Moltex  
[bettydraper@moltexenergy.com](mailto:bettydraper@moltexenergy.com)

-ENDS-

**About Moltex**

Moltex is an IP company and nuclear technology leader at the forefront of developing breakthrough technologies for nuclear energy. These include the Stable Salt Reactor – Wasteburner (SSR-W) which uses recycled nuclear waste as fuel; a Waste To Stable Salt (WATSS) process for recycling nuclear waste to produce new fuel; and GridReserve thermal energy storage tanks, which enable the SSR-W to act as a peaking plant. In addition to these technologies, Moltex's UK based sister company, MoltexFLEX, has advanced the FLEX reactor – a modular molten salt reactor designed for low-cost, flexible operation across electricity generation, hydrogen production and industrial heat.

Moltex was selected by NB Power to progress the development of its reactor technology in New Brunswick, Canada, with the goal of deploying first-of-a-kind SSR-W, WATSS and GridReserve units at the Point Lepreau site.

**Pages 4253 to / à 4254  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**15(1), 21(1)(a)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

## Hautfenne-Jewer, Celia

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**From:** McAllister, Andrew  
**Sent:** July 7, 2025 4:12 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: Reprocessing and Enrichment Working Groups  
**Attachments:** ENRICHMENT WORKING GROUP TIMELINE.pdf; 1973 Statement of Uranium Enrichment.pdf; Reprocessing WG List.pdf; Enrichment WG List.pdf

---

**From:** McAllister, Andrew  
**Sent:** July 24, 2024 11:34 AM  
**To:** Sigouin, Luc <luc.sigouin@cnscccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

Hi Luc,

To build on our conversation we had last week, NRCAN is planning to focus more on enrichment and wants to establish a working group. Julian is the DNCFR rep (there are others from the CNSC) on the NRCAN reprocessing WG.

With Nhan taking over as the lead on the SMR Readiness objective on enrichment, it makes sense for him to be DNCFR's rep on this NRCAN working group as well. This will ensure alignment between the two. Julian would be his back up.

Julian and Nhan have discussed this but I wanted to get your confirmation that you are fine with this path forward.

Happy to discuss further as needed.

Cheers,

Andrew

---

**From:** Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>  
**Sent:** Friday, July 19, 2024 8:01 AM  
**To:** McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>  
**Subject:** FW: Reprocessing and Enrichment Working Groups

FYI


---


*Julian Amalraj M.Sc, P.Eng, PMP*

Senior Project Officer / Agent principal de projet

Nuclear Processing Facilities Division / Division des installations de traitement nucleaires

Canadian Nuclear Safety Commission / Commission canadienne de surete nucleaire

 (613) 818-0515

 e-mail: [Julian.Amalraj@cnscccsn.gc.ca](mailto:Julian.Amalraj@cnscccsn.gc.ca)

**From:** Yuen, Pui Wai <puiwai.yuen@NRCan-RNCan.gc.ca>

**Sent:** Wednesday, July 17, 2024 4:49 PM

**To:** Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; Kim,Duck (ECCC) <duck.kim@ec.gc.ca>; jennifer.mckay@ec.gc.ca; catalin.obreja@ec.gc.ca; Elizabeth.White-Senack@ised-isde.gc.ca; Nourallah, Laura (ISED/ISDE) <laura.nourallah@ised-isde.gc.ca>; Reinholz, David <David.Reinholz@cnscccsn.gc.ca>; Kent, Michael <Michael.Kent@cnscccsn.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>; Amalraj, Julian <Julian.Amalraj@cnscccsn.gc.ca>; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; Dalzell, Matthew (PrairiesCan) <matthew.dalzell2@prairiescan.gc.ca>; Ballantyne, Anne (PrairiesCan) <anne.ballantyne@prairiescan.gc.ca>; Rosaasen, Canute (PrairiesCan) <Canute.Rosaasen@prairiescan.gc.ca>

**Cc:** Gilbeau, Amanda <amanda.gilbeau@nrca-nrcan.gc.ca>; Hoult, Colin <colin.hoult@nrca-nrcan.gc.ca>; Wilkinson, David (he, him | il, lui) <david.wilkinson@NRCan-RNCan.gc.ca>; Cox, Jenny <jenny.cox@nrca-nrcan.gc.ca>; Edwards, Geoff <Geoff.Edwards@nrca-nrcan.gc.ca>; Anderson, Emma (she, her | elle, la) <Emma.Anderson@nrca-nrcan.gc.ca>; Goulding, Liam <liam.goulding@nrca-nrcan.gc.ca>; Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>; Temnikov, Dimitri <dimitri.temnikov@NRCan-RNCan.gc.ca>; Wittmann, Tess (she, her | elle, elle) <tess.wittmann@nrca-nrcan.gc.ca>; Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>; Rector, Brianna (she, her | elle, la) <brianna.rector@nrca-nrcan.gc.ca>

**Subject:** Reprocessing and Enrichment Working Groups

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

PROTECTED A - PROTÉGÉ A

Dear Colleagues,

Thank you again for your support and flexibility as we determine the next steps for the reprocessing working group. [REDACTED] As such, and given that many of the members of the working groups would be the same, for efficiency purposes, we are proposing going forward with **two working groups**: one on reprocessing and one on enrichment [REDACTED]

Attached to this email are two sets of criteria for both working groups, and a timeline for the enrichment working group. For enrichment, our objective will be to assess the various criteria in relation to the 1973 enrichment statement by the Minister of Energy, Mines and Resources, Donald S. Macdonald (also attached for reference). We welcome any comments on either set of **criteria and confirmation of your organization's roles and key contacts by Wednesday, July 24, 2024**. We understand that there may be differences in staff representation for the two working groups if you could please indicate.

Once confirmed, NRCan will distribute the templates to populate for the various criteria. The leads of each criteria may wish to convene a meeting with the supporting organizations to coordinate analysis. We (NRCan) will soon also convene the first meetings for the criteria that we are leading (i.e. Technology Summary, Supply and Demand for Enriched Fuels/Materials, Economic Benefits and Costs, Energy Security and Industrial Development, International and Regional Relations on Enrichment, and Indigenous and Host Community Considerations).

We will send a calendar invite to the broad working group in the second half of August to reconvene and share updates. At the moment, we are not providing a timeline [REDACTED] and would like to further discuss this with you based on your organization capacity at the August meeting and the potential synergies between the two groups.

Thank you again for your expertise and collaboration. We look forward to working with you. Please forward to anyone in your organization who will be supporting this initiative that we may have missed.

Kind regards,  
Pui Wai Yuen

Pui Wai Yuen

Director | Directrice

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Nuclear Energy & Infrastructure Security Branch | Direction de l'énergie nucléaire et de la sécurité des infrastructures

Natural Resources Canada | Ressources naturelles Canada

[puiwai.yuen@nrcan-rncan.gc.ca](mailto:puiwai.yuen@nrcan-rncan.gc.ca)

Tel: 613-218-5067

**Page 4258**

**is withheld pursuant to section  
est retenue en vertu de l'article**

**21(1)(b)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

STATEMENT OF URANIUM ENRICHMENT

OTTAWA - The Minister of Energy, Mines and Resources, Donald S. Macdonald, issued today the following statement on the government's attitude towards the establishment of uranium enrichment facilities in Canada.

The statement is a result of several enquiries received concerning the government's attitude towards construction of uranium enrichment facilities in Canada by private industry.

The Canadian nuclear power programme uses natural uranium as its basic fuel and an industry manufacturing enriched uranium would rely primarily on export markets. An enrichment project could not be considered an essential national project in Canada requiring government ownership or subsidization as it might in many other countries dependent for a substantial fraction of their future energy needs on enriched uranium fuel. Its value would be measured by the extent of Canadian participation through the machinery and equipment industry, the involvement and development of engineering and technology, the employment of Canadians in both the construction and operating process, the possible advantage to our uranium industry, the taxation revenues to the country and overall benefit.

It would be in essence a secondary industry in which a raw material of either domestic or foreign origin would be further processed, and its economic worth would depend on the fraction of the sales revenue which would accrue as income to Canadians.

Any Canadian uranium enrichment project would be subject to control by the federal government through the Atomic Energy Control Act to ensure that Canada's obligations regarding the peaceful uses of atomic energy were fulfilled, and to ensure safety of workers and the public.

In view of the uncertainties and expense in developing independent enrichment technology, any company entering such a business would probably wish to use the technology which has already been developed in other countries. Such technology is highly classified and under close control of foreign governments.

As a result, a private company could not obtain access to foreign enrichment technology without a government-to-government agreement ensuring the protection of the information. Government officials are investigating the form of intergovernmental agreements which might be necessary. If an enrichment plant proposal is shown to be in the national interest and provided the terms are considered to be reasonable the federal government is prepared to negotiate such agreements.

Factors which the government will consider when assessing a proposal include:

- 1) The optimum use of Canadian energy resources;
- 2) The extent to which Canadian uranium producers would have access to the enrichment plant both for processing services and for the supply of uranium feed material;
- 3) The extent to which Canadians would participate in the financing, engineering, construction, operation, supply of materials and equipment, ownership and management of the facility;
- 4) The timing of the project in relation to other major construction projects in Canada;

- 5) The details of financing; the government would likely monitor the movement of funds in and out of Canada in respect of the project;
- 6) The contractual arrangements with any foreign participants and with the supplier of the enrichment technology;
- 7) Effects on the environment;
- 8) National and regional economic impact, both short and long-term.

It is expected that interested firms will discuss with government officials at appropriate stages any proposals for uranium enrichment which they might be developing.

August 1, 1973

# An Assessment of Enrichment in Canada

2024 Interdepartmental Working Group

Criteria	Lead Department	Supporting Department(s)	Kept in the Loop	Contacts
Technology Summary	NRCan			NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
Supply and Demand for Enriched Fuels/Materials	NRCan	GAC PrairiesCAN TC		NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				GAC Tanya Hinton Naina Thoppil
				PrairiesCAN Matthew Dalzell Anne Ballantyne Canute Rosaasen
				TC Daniel Daigle
Environmental Effect (+Waste)	ECCC CNCS	NRCan HC (if includes humans)		ECCC Duck Kim Jennifer McKay Catalin Obreja
				CNCS David Reinholz Michael Kent Tessa Henley Julian Amalraj
				NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				HC Marc Desrosiers
Economic Benefits and Costs	NRCan	ISED ECCC	PrairiesCAN	NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				ISED Elizabeth White Laura Nourallah
				ECCC Duck Kim Jennifer McKay Catalin Obreja
				PrairiesCAN Matthew Dalzell Anne Ballantyne Canute Rosaasen
Domestic Regulatory Environment	CNCS	NRCan TC		CNCS David Reinholz Michael Kent Tessa Henley Julian Amalraj
				NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				TC Daniel Daigle
Energy Security and Industrial Development	NRCan	GAC ISED	PrairiesCAN	NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				GAC Tanya Hinton Naina Thoppil
				ISED Elizabeth White Laura Nourallah
				PrairiesCAN Matthew Dalzell Anne Ballantyne Canute Rosaasen
Non-Proliferation and Safeguarding, Import and Export Control Considerations	GAC CNCS	NRCan		GAC Tanya Hinton Naina Thoppil
				CNCS David Reinholz Michael Kent Tessa Henley Julian Amalraj
				NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
International and Regional Relations on Enrichment	GAC NRCan	PrairiesCAN		GAC Tanya Hinton Naina Thoppil
				NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				PrairiesCAN Matthew Dalzell Anne Ballantyne Canute Rosaasen
Indigenous and Host Community Considerations	ECCC NRCan	HC PrairiesCAN	CNCS	ECCC Duck Kim Jennifer McKay Catalin Obreja
				NRCan Dimitri Temnikov Tess Wittmann Liam Goulding
				HC Marc Desrosiers
				PrairiesCAN Matthew Dalzell Anne Ballantyne Canute Rosaasen
				CNCS David Reinholz Michael Kent Tessa Henley Julian Amalraj

## Hautfenne-Jewer, Celia

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**From:** McAllister, Andrew  
**Sent:** July 7, 2025 4:13 PM  
**To:** Hautfenne-Jewer, Celia  
**Subject:** FW: RE: next week's Project Yellow meeting

---

**From:** Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>  
**Sent:** May 29, 2024 11:38 AM  
**To:** Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>; Bourassa, Pascale <Pascale.Bourassa@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Mecke, Julie <julie.mecke@cnscccsn.gc.ca>  
**Cc:** Gratton, Wayne <wayne.gratton@cnscccsn.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>  
**Subject:** RE: RE: next week's Project Yellow meeting

Thanks Lee,

I've been attending the meetings since the genesis, so as long as Julie is comfortable, I'll continue to attend and represent NPECD.

Cheers,

Kate

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Kathleen Prosser, PhD  
Senior Advisor, Nuclear Non-Proliferation | Conseiller principal, non-prolifération nucléaire

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**From:** Brunarski, Lee <Lee.Brunarski@cnscccsn.gc.ca>  
**Sent:** Wednesday, May 29, 2024 11:37 AM  
**To:** Bourassa, Pascale <Pascale.Bourassa@cnscccsn.gc.ca>; McAllister, Andrew <Andrew.McAllister@cnscccsn.gc.ca>; Prosser, Kathleen <kathleen.prosser@cnscccsn.gc.ca>; Mecke, Julie <julie.mecke@cnscccsn.gc.ca>  
**Cc:** Gratton, Wayne <wayne.gratton@cnscccsn.gc.ca>; Henley, Tessa <tessa.henley@cnscccsn.gc.ca>  
**Subject:** RE: next week's Project Yellow meeting

Hello Andrew, Julie (for Pascale) and Kate.

In the interest of the CNSC not being overly represented, grateful if you would confirm at your convenience if you or one of your team members/colleagues will be attending next week's Project Yellow – Deal Team meeting on June 5 from 10 – 10:30.

Wayne, Tessa and I are all on the invite, but only one of us will attend to observe and support (if/as appropriate), and to take notes to contribute to an internal summary.

Thanks!

Lee

**Pages 4263 to / à 4266  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**20(1)(b), 21(1)(a)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**

**Hautfenne-Jewer, Celia**

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**From:** Fairchild, Jamie <jamie.fairchild@NRCan-RNCan.gc.ca>  
**Sent:** May 22, 2024 11:05 AM  
**To:** Brunarski, Lee; Gratton, Wayne; Saric, Jasmine; Bourassa, Pascale; Reinholz, David; Kanasewich, Elaine; Amalraj, Julian  
**Cc:** Thiele, Lisa; Temnikov, Dimitri; Kenney, Jason; Yuen, Pui Wai; Prosser, Kathleen  
**Subject:** HR Update!

EXTERNAL EMAIL – USE CAUTION / COURRIEL EXTERNE – FAITES PREUVE DE PRUDENCE

UNCLASSIFIED - NON CLASSIFIÉ

Hey folks!

I hope all is well.

Just wanted to share (and as you may have already heard), that I'll be [REDACTED] starting later this summer [REDACTED]

I'll be around until mid-late summer but will start to transition things operationally to my wonderful colleagues.

Jason and Pui Wai will lead on the NLCA file in my absence. There may also be some other changes on the EM front within our NEISB Branch but will let Pui Wai convey those changes to you once finalized.

Dimitri Temnikov will lead on uranium/nuclear fuel, supported by some new additions to our team. It's worth noting that our long-time colleague Dr. Tom Calvert [REDACTED]. We've been fortunate to find some excellent folk to replace us and will do our best to transition things seamlessly over the next few months.

It's truly been a pleasure working with you all.

Have a lovely day and keep in touch (including if [REDACTED]).

Best,

*Jamie Fairchild*

(he/him/il/lui)

Senior Advisor | Conseiller principale

Uranium and Radioactive Waste Division | Division de l'uranium et des déchets radioactifs

Natural Resources Canada | Ressources naturelles Canada

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Telephone | Téléphone: 343.543.6983

**NEW:** [jamie.fairchild@NRCan-RNCan.gc.ca](mailto:jamie.fairchild@NRCan-RNCan.gc.ca)

**Pages 4268 to / à 4282  
are withheld pursuant to sections  
sont retenues en vertu des articles**

**15(1), 20(1)(b)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**