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BEYOND BITCOIN:
Using Blockchain to Increase Efficiency and Data Reliability in the Additions to Reserve and Reserve Creation Process

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SUMMARY

- This briefing note proposes blockchain technology as a possible solution to address the inefficiencies present in the Additions to Reserve (ATR) / Reserve Creation process. Should you agree that blockchain is a viable solution, it is recommended that INAC partner with Innovation Science Economic Development (ISED) to develop a use case scenario.
- The ATR process created through the 2016 ATR / Reserve Creation Policy Directive is inefficient and unable to guarantee that ATR or Reserve Creation land submissions move at the speed of business.
- Blockchain presents an opportunity to significantly expedite the ATR process by reducing the number of steps, reducing potential administrative errors within submission packages, facilitating an almost immediate exchange of information between parties, and ensuring that all parties involved in the ATR process are accountable to a high standard of accuracy and transparency.
- This proposal is consistent with Blueprint 2020 principles (e.g., "a modern workplace that makes smart use of new technologies" and "an open and networked environment").

ISSUE

- ATR process created through the 2016 ATR / Reserve Creation Policy Directive is inefficient and unable to guarantee that ATR or Reserve Creation land submissions move at the speed of business.
- The cumbersome, multi-step approval process, and highly technical administrative standards within the ATR process present significant road blocks for First Nations. A single ATR can take more than several years to complete due to an overly complex, non-user-friendly process.
- The ATR process is complex for First Nations that do not have the staff, experience, proper training or knowledge of the ATR process.
- The process is extremely time consuming and contains over 50 steps from the time an ATR opportunity or need is identified to the completion of a Ministerial Order (MO) or Order in Council (OIC).
- The process requires involvement from multiple stakeholders, including First Nations, Indigenous and Northern Affairs Canada (INAC) Headquarters, Regional INAC officials, municipalities, Natural Resources Canada, and third-party stakeholders, which creates additional complexity.

BACKGROUND

- The Government of Canada has identified ATRs as an important aspect of reconciliation with First Nations to improve treaty relationships and create new economic opportunities for First Nation communities.
- In order to fully implement the *United Nations Declaration on the Rights of Indigenous Peoples* (Articles 8, 12, 25, 26, 27, 28, and 32), a comprehensive approach must be taken that requires appropriate measures outside the review of policies and laws.
- ATRs provide land for housing, traditional and/or cultural activities that improves the overall quality of life for many communities.
- Economic development opportunities, retail spaces, commercial development, and resource extraction, may not be feasible without an expanded land base.
- Canada has a legal obligation to return land to First Nations communities, established by Treaty Land Entitlement Agreements (Manitoba 1997 and Saskatchewan 1992) and Specific Claims Agreements.
- Fee simple land can be converted to reserve status and land can be exchanged between parties using the ATR process.
- Since 2006, Canada has added more than 1 million acres of land to reserve.
- There are currently approximately 1,300 active ATR files. Once these are approved, approximately 1.3 million acres of land will be added to reserve. Additional files are anticipated as new agreements are negotiated and new needs are identified in First Nation communities across Canada.
- ATRs can be time sensitive and must be capitalized on in short time periods to secure business opportunities.
- Given the numerous steps in the process, there are several possible sources of delay, including determining mineral rights owners, preliminary environmental research, land

title searches, environmental site assessments, land designations, consultation, and registration. Furthermore, land submission packages must meet highly technical administrative standards.

PROPOSED APPROACH

Blockchain technology can be used to enhance data reliability and improve efficiency within the ATR process by facilitating verification of proposal documents, immediate automated notification processes, streamlined Band Council Resolution voting, automated review of proposals, and registration of OICs or MOs in the Indian Land Registry.[1]

Overview of the Technology

Blockchain, despite being commonly associated with Bitcoin, has several characteristics that are directly applicable to the public sector. The technology operates as a distributed consensus ledger that creates a digital record of trusted transactions maintained among and across trusted participants. In place of multiple independent and isolated ledgers or centralized databases, there is one record that is shared among every party to the transaction (White, Killmeyer, & Chew 2017).

To ensure the data is secure, it is stored in blocks with a unique hash key. When new blocks are posted to the ledger, they are linked with the hash key creating a chain. Once the data is contained in a chain, it cannot be deleted or altered by a single actor; instead, automation and shared governance protocols are used to verify and manage it (Cheng, Daub, Domeyer, & Lundqvist 2017). Blockchain allows trusted users to access and share reliable and transparent information, thereby eliminating the need to provide the same information to multiple parties. Consequently, transactions can be expedited with greater speed and security than centralized processing systems.

Application to ATR Process

A distributed ledger would enhance efficiency by facilitating collaboration of the multiple stakeholders involved, which is consistent with ‘tell us once’ information gathering suggested by Blueprint 2020’s ‘Smart Use of Technology’ principle, as well as the enhanced access to government services and effective partnerships and networks associated with the ‘Open and Networked Environment’ principle (Privy Council Office, 2013).

Blockchain would expedite the ATR process, ensuring that ATR proposals would move at the speed of business. First, Band Council Resolution voting could be facilitated by blockchain ensuring that no illegitimate voting occurs and that all votes are counted. Second, ATR proposals would have to meet the requirements set out in the blockchain in order to be approved and move forward through the process. Review and approval of proposals would be almost immediate as governance protocols would verify that the proposals met all requirements as set out in the system. Third, templates or fillable forms with drop-down menus would be used to minimize the potential for administrative errors, and ensure greater accessibility for First Nations communities as compared to the current process. Finally, once completed, the data would be added to the ledger, and Indian Land Registry, using a hash, and validated through additional governance protocols and automation ensuring a quick and efficient process.

CONSIDERATIONS

- This proposal is aligned with many of the programs identified in 2017-2018 INAC Departmental Plan Program (DPP).
- Using blockchain technology to underpin the ATR process will address Program 1.2: Rights and Interests of Indigenous Peoples by altering processes addressing outstanding rights and resolve historic grievances involving land quickly and efficiently.
- The increased efficiency of the process would contribute directly to INAC's DPP Program 3.1: Indigenous Entrepreneurship, which improves employment and economic outcomes for Indigenous peoples and reduces socio-economic gaps by supporting the creation and expansion of viable Indigenous businesses.
- Blockchain will ensure that land submissions are completed at the speed of business, thereby supporting DPP Program 3.2: Community Economic Development as First Nations communities will be better able to pursue economic development and improve

[1] Annex B provides an overview of proposed changes to the ATR process.

Indigenous business and employment opportunities.

- This proposal is in line with the Government of Canada's innovation agenda as various departments and agencies have been involved in various proof of concepts (Hendry, 2017).
- Blockchain has been successfully implemented internationally (e.g. Estonia, The Republic of Georgia, Sweden, India, Dubai, and the City of Illinois). These jurisdictions have begun to use the technology for registries in a variety of related spheres (e-Estonia; Shin, 2017; Reuters, 2017; Browne, 2017; Nordrum, 2017).[2]

RISKS

- Blockchain is relatively new within the public sector. Current experience in Canada is limited to proofs of concept so it is unlikely that blockchain technology will be widely used in the near future. However, given the specific nature of this proposal, it would lend itself well for a pilot project.
- Given that internal expertise may be limited, the Government of Canada would have to engage a private sector firm (e.g., IBM, Chromaway, Factom, Bitfury, or Velox) as many public sectors have done internationally. Using an outside firm raises some contracting issues and potential for high costs. The recent Auditor General's report on the Phoenix Pay System may offer some guidance in how risk may be mitigated in this area.
- Although blockchain offers several inherent safeguards, the Privacy Commissioner is actively involved in providing input to international standards related to blockchain (Privacy Commissioner of Canada 2017). These standards could further mitigate the risk of privacy breaches associated with this proposal.

RECOMMENDATION

It is recommended that INAC partner with ISED on a research project.[3]

- The advantage of this option is that ISED is currently working with the Blockchain Research Institute on a research project that will explore four use case scenarios, and are currently looking to partner with other government departments.
- The disadvantage of this option is that ISED may not be aware of the priorities of INAC and may not be well-versed in the topic of ATR, therefore, creating possible roadblocks in the application of the technology in this specific context.

[2] Refer to Annex C for additional details on blockchain use in the public sector, both domestically and internationally.

[3] Refer to Annex D for alternative options considered.

ANNEX A – Glossary

Band Council Resolution: Community consent is necessary for the ATR to proceed; thus a Band Council Resolution is required for all ATR proposals. The BCR will contain the formal proposal seeking to add land to an existing reserve or to create a new reserve. The motion must be approved by a quorum of the Council (NALMA, 2017).

Bitcoin: A type of digital currency (i.e. cryptocurrency) that is independent from central banks. Blockchain is the technology that underpins bitcoin transactions. It runs on an open network.

Blockchain: A digitized and decentralized public ledger used to record transactions. Blockchain can be used on open (such as in the case of Bitcoin) or closed networks where access is limited to trusted partners. The latter type is more suitable for public sector application.

Distributed consensus ledger: A database that is used to record asset transactions without a central database or administrator. Instead, transactions are shared, replicated, and synchronized among trusted parties in a network.

Fee Simple: A permanent and absolute tenure of an estate in land with freedom to dispose of at will.

Hash: A unique key developed using cryptography and used to link two blocks of data within a chain.

Reserve: As identified in the *Indian Act*, reserve land is "a tract of land the legal title to which is vested in Her Majesty, which has been set apart by Her Majesty for the use and benefit of a band." Legal title to reserve land is held by the Crown rather than by individuals or organization.

Specific Claims: Deal with the past grievances of First Nations. These grievances relate to Canada's obligations under historic treaties or the way it managed First Nation funds or assets. The Government of Canada prefers to resolve these claims by negotiating settlements with First Nations (Canada, 2015).

Treaty Land Entitlement Agreements: First Nations who did not receive all the land they were entitled to under treaties signed by the Crown and First Nations, can file a Treaty Land Entitlement (TLE) claim with the Government of Canada. TLE settlement agreements are negotiated between First Nations and the Government of Canada, typically with the participation of provincial/territorial governments. The federal government must adhere to treaty obligations to provide the promised amount of reserve land to treaty First Nations. Generally, a TLE settlement agreement specifies an amount of land that a First Nation may either purchase on a willing buyer-willing seller basis, or select from unoccupied Crown land, or both in some cases, within an agreed to acquisition or selection area. Once purchased or selected, the First Nation may submit a proposal to the Government of Canada for the land to be added to the First Nation's reserve under the ATR process (Canada, 2017).

ANNEX B – Proposed Changes to ATR Process

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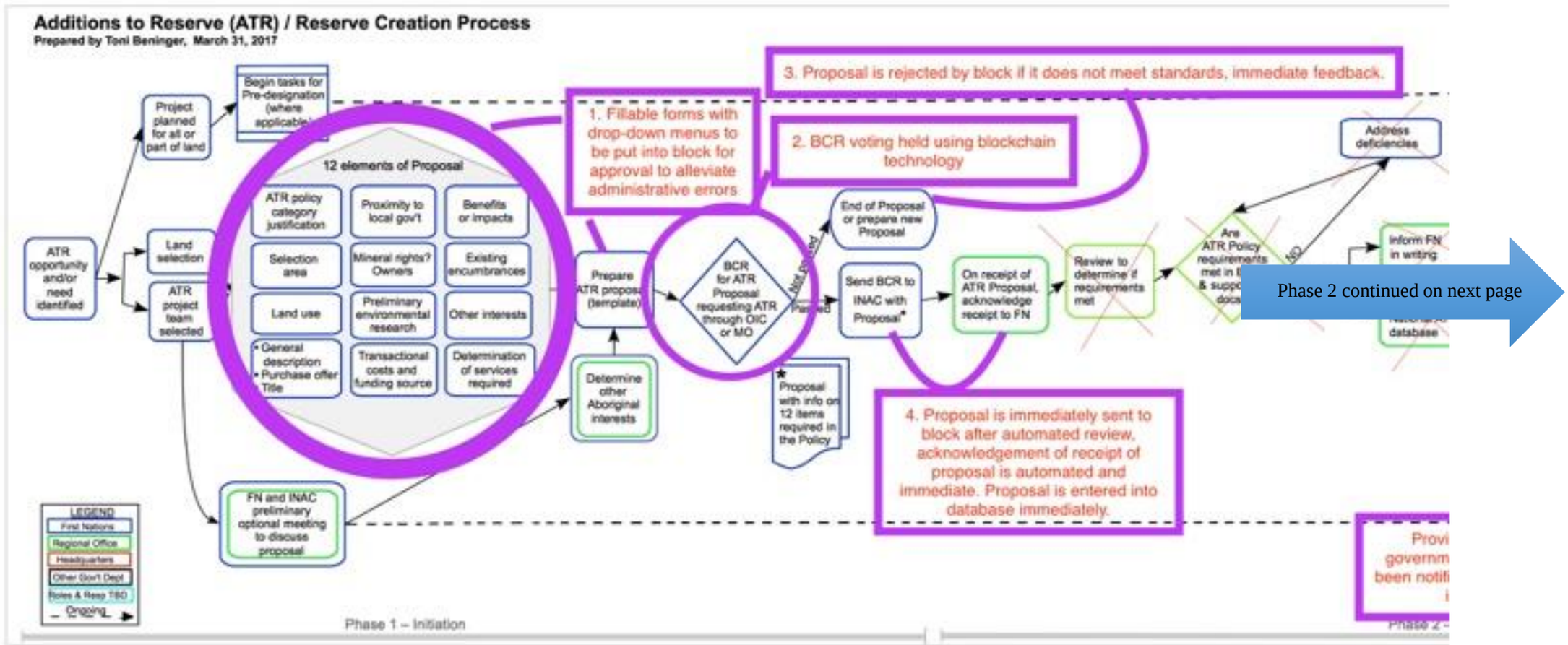

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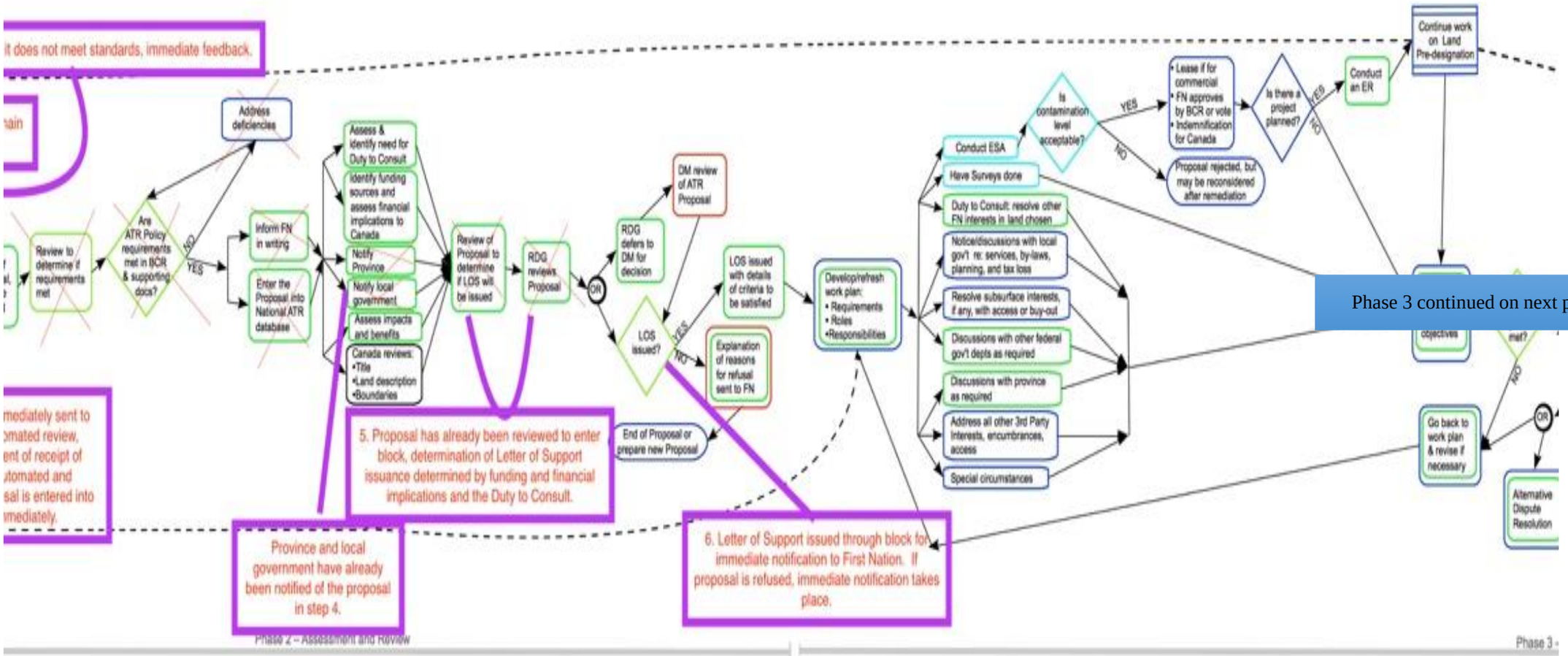

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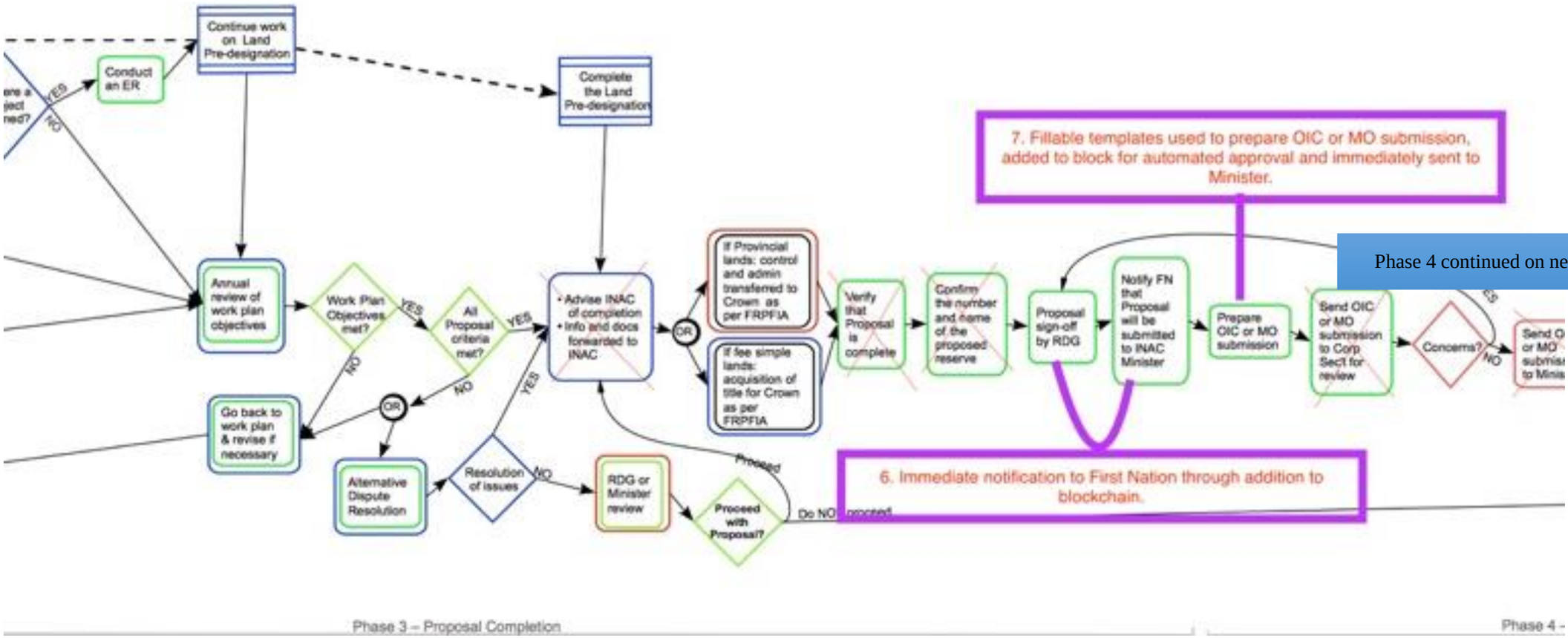

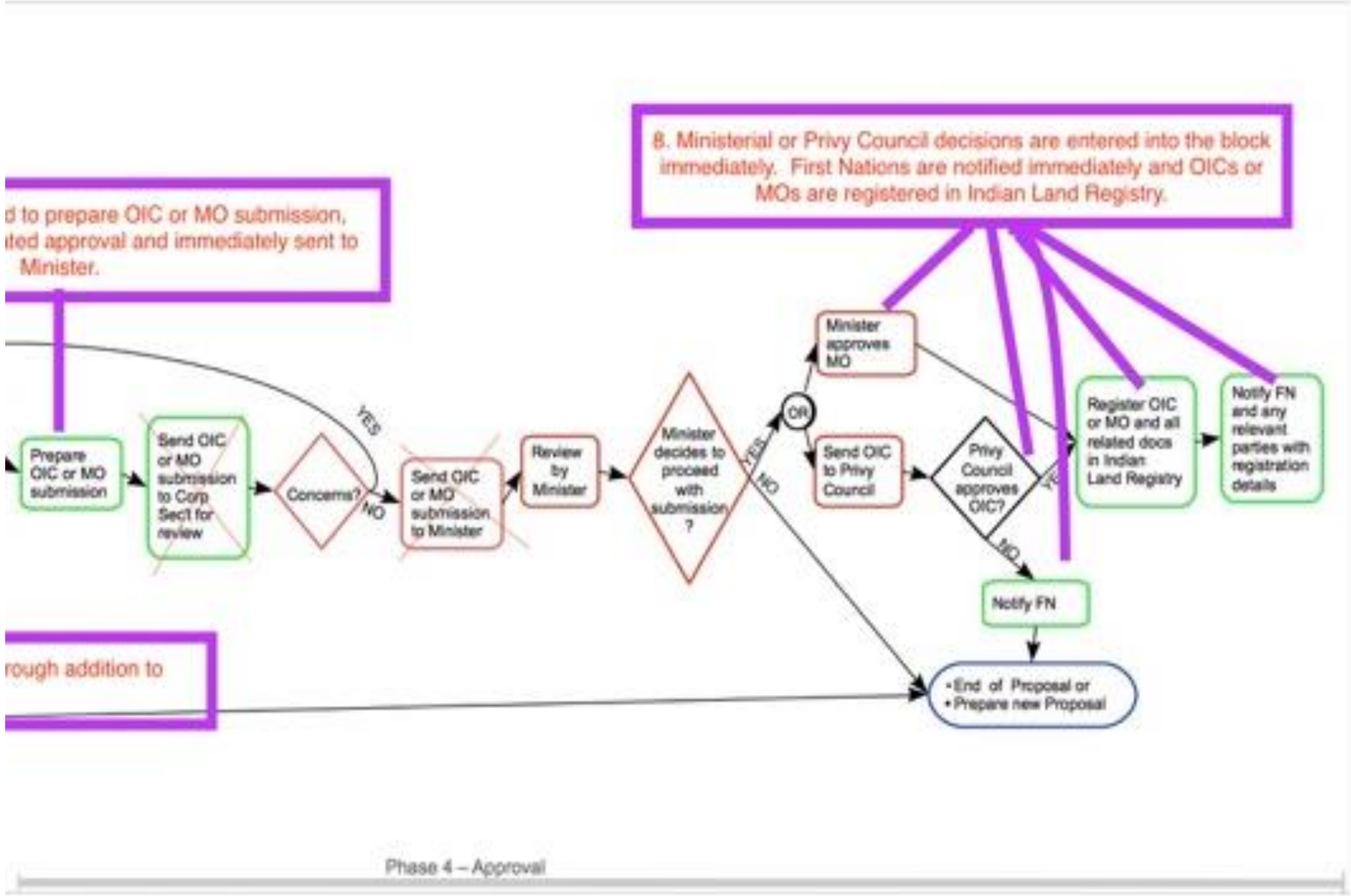

End of Process

ANNEX C – Blockchain Use in the Public Sector

Domestic Examples

In Canada, public sector use of blockchain technology has been limited to proof of concepts. For example, the Bank of Canada is exploring its application for payment systems, National Research Council for its Industrial Research Assistance Program, Natural Resources Canada in relation to the Extractive Sector Transparency Measures Act, and Immigration, Refugees and Citizenship Canada for tracking immigration applications. The federal government also recently undertook a joint initiative with the province of Ontario and the city of Toronto to explore streamlining business permits and licenses (Hendry, 2017).

International Examples

Since 2012, blockchain has been in operational use in Estonia's registries such as national health, judicial, legislative, security and commercial code systems, and there are plans to extend the technology to other areas (e-Estonia). The Republic of Georgia committed to using blockchain to validate property-related government transactions, and it should be fully operational by end of year for purchases and sales of land titles, registration of new land titles, demolition of property, mortgages and rentals, and notary services (Shin 2017). Ukraine is using blockchain to auction seized assets, and plans to use the platform for state property and land registries by the end of the year (Reuters 2017). Pilots for similar systems are also underway in Sweden, India, Dubai, and the City of Illinois (Browne 2017; Nordrum 2017).

ANNEX D – Alternative Options Considered

The options below were also considered, though not recommended.

1. Status Quo
   - The advantage of this option is that additional resources would not be required to build a new solution. The current process, though inefficient, could proceed without any delays to investigate process improvement.
   - The disadvantage of this option is that the process will remain inefficient and cumbersome. Consequently, economic opportunities that require ATRs will be at risk, thus negatively impacting First Nations communities who wish to capitalize on these opportunities.

2. Task the INAC HQ ATR team with a feasibility study of the implementation of blockchain technology for the ATR process to present options for further consideration.
   - The advantage of this option is that the Government of Canada will be able to have options grounded in extensive research on blockchain technology.
   - The disadvantage of this option is that there may be useful proprietary information that may be inaccessible in the research phase.

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