Konrad

Whitepaper

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Konrad Team

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Content Page

Important Notice

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Risks Factors

In evaluating the Company's issuance of this token and the information provided in the Whitepaper, token holders should also consider the following risk factors. The risks listed here are not exhaustive and does not purport to set out all challenges or issues that may be present or that may arise in the future. There may be other risks that are not described below, or are currently unknown or considered not significant during or after the issuance. Unspecified risks may exist and may become a major risk or has a significant adverse effect on the project. Token holders are to unequivocally agree that they have not relied on this Whitepaper and agree to assume all risks and uncertainties, including purchase price losses.

• **Private key(s) may be compromised**

Private access keys or a combination thereof is necessary to access and control any tokens you have stored in your digital wallet(s). In the event that these keys are lost, stolen or hacked by a third party, or if the service provider gets compromised, you may lose all of the tokens you have stored with little or no way of recourse. The Company shall accept no liability to the token holder in such situations.

• **Delays and/or default in delivery**

Due to the nature of the blockchain technology being used for cryptocurrencies, including the token issuer's smart contract system, the purchaser may not receive the tokens on the same day that the purchase price is paid, or at all, and the blockchain may be prone to periodic congestion during which the purchaser's transactions may be delayed or lost.

• **Resource volatility**

The Company remains vulnerable to price fluctuations of the resources used to fund the development of the token and the Konrad protocol. Such resources are derived from the sale of the tokens, Ethereum, Bitcoin or other related cryptocurrencies as applicable, and fiat currency. The ongoing development and maintenance of the Company's technologies and infrastructure may be adversely affected, delayed or suspended by such volatility.

• **Cybercrime and security failure**

The Konrad protocol and/or the tokens may be susceptible to malicious cyberattacks by autonomous software or hackers, and other illegal cyber activities. Such attacks could include phishing, malware attacks, distributed denial of service attacks, consensus-based attacks, sybil attacks, smurfing and spoofing. The security of the Konrad protocol's core infrastructure may also be compromised by external agents, which could debilitate the functioning of Konrad protocol and the tokens.

• **Secondary markets**

Secondary markets may not materialise to allow trading of the tokens. In absence of any valuation system, the tokens may have little to no value outside of the Konrad protocol, or they may be subjected to lack of demand or illiquidity, leading to volatile price fluctuations. Further, many third-party secondary exchanges function with little supervision from the relevant authorities, heightening the risk of failure, fraud, theft, or market manipulation.

• **Ecosystem risks**

Due to the uncertainties in the cryptocurrency industry, including but not limited to resource volatility, corporate failures, governmental laws and regulations, inadequate technological development, or any other unforeseen circumstances, the Company or the Konrad protocol may be subjected to various risks to the ecosystem, including being subject to liquidation, an order to wind up the Company or other schemes of arrangement with its creditors. The Company shall not be liable to token holders for any claims, loss or damage that results from such risks.

• **Project development risk**

The Konrad ecosystem has not yet been designed and remains to be reviewed, changed and further researched and developed. There is no guarantee that Konrad smart contracts and tokens will work as expected, or that they will work. There may be situations where modifications need to be done to the entire ecosystem or where token characteristics have to be redefined in any way. In addition, the Konrad protocol may suffer from system failures due to lack of proper maintenance. The Company will not be liable to token holders for claims, losses or damage arising from the project development failures.

• Lack of adoption

With an increasing number of end user risks, the effectiveness of the Konrad protocol depends on the adoption and participation of a large number of users in order to achieve functional and commercial feasibility. If the platform does not have sufficient users, the functionality of the Konrad platform and the potential utility of tokens may be reduced or commercially unviable. The Company will not assume legal responsibility to token holders due to the lack of participating users.

• Regulatory impact

The regulatory status of blockchain technology, including cryptographic tokens and digital assets is unclear in many jurisdictions. In the event that any governmental authority makes changes to existing laws, regulations and/or rules or financial institutions make commercial decisions and such changes/decisions negatively impact the tokens in various ways, the Company shall be entitled to cease the distribution and maintenance of the tokens or cease operations in any jurisdiction without incurring any liability whatsoever to the purchaser.

• Reliance on third parties

The Company may rely on third parties, in whole or in part, to implement the sale, development or supply of the tokens, and there is no assurance or guarantee that third parties will be competent, complete their work for the Company, properly carry out their obligations, or otherwise meet any party's needs, all of which might have a material adverse effect on the issuer's ability to perform its obligations under this Whitepaper.

• Other unforeseen circumstances

Much of the blockchain industry remains unchartered and untested. Hence there may be a variety of unforeseen and unanticipated risks associated with the tokens and the Konrad protocol which are not explicitly addressed herein. Such risks may materialize at any point before or after the token holder acquires or uses the tokens.

• No offer of securities

The tokens are not being structured or sold as securities or any other form of investment product. None of the information presented by the Whitepaper is intended to form the basis for any investment decision, and no specific recommendations are intended. No regulatory authority has examined or approved any information set out in the Whitepaper or any information provided or communicated by the white paper and the publication and dissemination of any such information does not imply that applicable laws, regulatory requirements or rules have

been complied with. After the issuance of the tokens, the Company may enact changes to its operations or business model. Token holders should consult their own lawyers, accountants, auditors, tax agents or other professional advisers if they have any questions about the Whitepaper and its summary.

• **Intellectual property statement**.

The Company reserves all ownership, use and other rights associated with the Konrad protocol including but not limited to all intellectual and proprietary rights. Token holders acquires no right, title or interest in or to any of the foregoing through their purchase of the tokens, other than the rights expressly granted.

Executive Summary

Owing to the traceable, programmable and immutable nature of distributed networks, traditional assets such as real estate, data assets, intellectual properties, financial assets and precious metal assets, can be registered in the form of digital assets. Under the premise of guaranteeing the uniqueness and the authority of the assets, asset digitalisation allows for division, transfer and valuation adjustment in a more liquid environment on a higher physical level. This is of great significance specifically to assets with relatively low liquidity due to physical constraints (i.e. Real estate and precious metal assets), those that are difficult to valuate and are prone to being monopolised (i.e. data assets and intellectual properties), and those that are highly dependent on the transparency of transaction activities (i.e. stocks, bonds, hedge fund and financial assets such as options, futures and etc.). It is perfectly conceivable that "asset digitalisation" is going to become one of the most pertinent issues in the coming decade.

Asset digitalisation includes the following key aspects: 1. Digitalising physical assets and projecting them onto blockchain network: this can be achieved by content-based addressable hash and time stamp, both of which are able to preserve the uniqueness and the integrity of transaction records. 2. The circulation of assets: for the time being, asset circulation is operated on a single platform. Alternative solutions such as sidechains could realise cross-network and cross-chain transactions and trading in the future. 3. Complex behaviours: Ethereum-initiated blockchain Virtual Machine technology adds programmability to digital assets and transactions and thus, enables more complex activities to be performed in nodes.

Konrad is a digitalised platform that provides asset auditing, registration and trading services and is dedicated to facilitating real-world asset registration and transition into digital assets. Konrad will be providing its first asset registration and digitalisation services to mining projects, focusing on the digitalisation of future Head Ores mined which will be endued with greater liquidity and operability.

1. Background

1.1. Asset Tokenization

Tokenization of assets refers to issuing of digital tokens to represent a real tradable asset. Asset tokenization, enabled by the Distributed Ledger Technology(DLT), otherwise called as 'Blockchain' technology, has brought about a pleasant change to the traditional investment space by making the concept of fractionalisation of asset ownership viable. Before the asset tokenization was brought into the scene of investment, people could never make an investment for a few square meters of land in an apartment. Likewise, sharing the ownership for a piece of artwork or a piece of gold bar was not an option nor achievable idea in the traditional investment market. However, with the new model of ownership facilitated by asset tokenization, it has become possible to share ownership of various types of assets, from real estates and properties, objects like artworks, cars and minerals to even intangible assets like energy.

1.2 New Investment Model

Asset tokenization and its new model of ownership and business model has some evident advantages to traditional investment options. First of all, asset tokenization has lowered the barrier to start an investment. Buying an apartment, a piece of property or artwork is poses a high barrier to most entry level investors as investing into these assets requires a huge sum of money to be paid at one shot. Instead, if the value of such expensive asset is divided to thousands and millions of tokens, individuals are able to purchase a portion of total number of tokens to make an investment.

The second benefit that investors can enjoy from asset tokenization is liquidity. By using digitalised tokens to represent the value to assets, both buying and selling of assets have become much easier. People looking for urgent cash flows do not need to sell their whole properties to receive more than what they need and lose their hard-earned properties. Also, since it is financially more viable to invest in digital tokens than a whole property, better liquidity can be provided to the investment market by ensuring not only broader investor audiences to the sellers but also wider investment choices to investors.

1.3 Blockchain in Investment

The characteristics of the blockchain technology also comes in handy when it is applied to the field of asset tokenization. Firstly, by carrying out asset tokenization and completing token transactions on smart contracts, the tedious and cumbersome process of converting the values of assets into tokens can become much smoother and simpler. Smart contracts are able to automate administrative processes involved in asset tokenization, and this in turn, can shorten the whole process of buying and selling. With fewer intermediaries needed, time as well as fees required for asset tokenization can be reduced.

Additionally, various terms and conditions related to asset tokenization can be embedded on smart contracts. Technically, these can be customised depending on the types, characteristics and region in which the assets are being sold. As such, smart contracts can exercise a high level of flexibility when tailoring administrative processes for different types of assets, and subsequently provide better security and transparency when assets are being tokenized.

1.4 Problem

Despite all these potentials that asset tokenization may possess, asset tokenization is still largely in its exploration stage. Some hurdle for investors or investees to enter the asset tokenization market includes legal restrictions and lack of an appropriate platform. However, this does not mean that there are no asset tokenization platforms. In fact, increasing number of firms are exploring into the provision of asset tokenization platform, and their tokenization platforms also differ in various aspects, from the scope of the services, system structure, tokenization fees to even the types of assets they are dealing with.

These platforms can be mainly separated into two types depending on the scope of assets for which they are providing asset tokenization services: the first type focuses on specific type of assets such as real estates or artworks, while the other are open for most types of assets. While both types of asset tokenization platforms could serve as excellent tokenization venue for most types of assets with the virtue of decentralisation and the blockchain technology, there is a certain type of assets that is not largely dealt in these platforms, and that is raw material assets.

Asset tokenization platforms that specialise in tokenising raw materials assets are few and far between. This may not be surprising as investing in assets like real estates and artworks is preferred over investing in material assets like platinum or silver (maybe with the exception of gold) largely due to the volatility of prices of raw materials and the lack of liquidity. Also, raw materials tend to require more frequent assessment of its values compared to other assets such as properties. As such, Konrad Platform is here to offer an alternative investment option for raw materials assets by providing an asset tokenization platform that is focused on tokenising raw materials and bringing investors into the tight-knit relationship of raw materials suppliers (e.g. mining industries) and material processing industries (e.g. refineries).

1.5 Solution

Konrad Platform can be characterised by the services that it provides: asset valuation, tokenization and trading. To help your understanding, illustration on how Konrad Platform can be used in raw material asset tokenization will be demonstrated with a real use case. The scenario given here is the application of Konrad Platform on a mining project:

A certain mining project could decide to list their ores as an asset on Konrad Platform. Using the Konrad's asset tokenization platform, the ore-backed tokens could be listed and every token could represent a certain unit of the ores mined from the stopes that the mining firm owns.

Raw materials like ores mined from stopes need to be assessed periodically for its content because the concentrations of precious metal contents in the ores vary with the mining depth. Naturally, the value of ores will be evaluated with the consideration of current market prices of various types of precious materials like gold and platinum. As such, Konrad provides asset evaluation service to projects that list their assets on the tokenization platform. Also, experts from various fields will constitute nodes in a decentralised assessment platform to agree upon whether the price provided based on the asset value evaluation report is reasonable.

To deal with the volatility and liquidity of raw materials, Konrad's trading platform could be adjusted to consist of multiple layers of sellers and buyers. For example, when a mining company lists its ores on Konrad's trading platform, individual investors can make their investments in ore-backed tokens by exchanging them with the utility tokens of Konrad Platform, KDX. Subsequently, companies that refine ores could initiate trading with these investors on Konrad's trading platform to exchange fiat currencies or other renowned cryptocurrencies with these ore-backed tokens. After the trading is completed, these refining companies can claim ores from the mining company using the ore-backed tokens. The returned ore-backed tokens will be burnt by the issuer, which is the mining company itself.

Noteworthy characteristic about this investment structure is that investing into the ores mined instead of the mining firm itself allows more flexibility for investors. Investors are able to freely adjust the volume of investment upon closely observing the life-cycle of stopes or the price of precious metals that compose the ores. Since there would always be demand from refining companies for the raw materials, the investors could be least affected by the ups-and-downs of the prices of raw materials.

Konrad Platform will make necessary arrangements to facilitate the trading between various parties. Utilising Konrad's asset valuation and tokenization platform and enabling multi-layer trading will allow more room for innovative asset tokenization. Konrad thus expects that not only ores, but other investable assets could also participate in this lucrative asset tokenization market.

2. Introducing Konrad

Konrad is a distributed service platform that supports asset auditing and digitalised trading. It is committed to transforming the real-world assets into blockchain assets with greater liquidity and transparency. Structurally, Konrad mainly consists of an asset valuation and auditing platform (responsible of the valuation and auditing of assets to be digitalised, the validation of the authenticity and reliability of corresponding assets, and periodically auditing specific assets), an asset registration and distribution platform (responsible for the distribution and disposal of assets, the tokenization and disposal of specific assets) and a trading and circulation platform (that supports the transfer, trading, valuation adjustment and other more complex transactions). In terms of the nature of services provided, Konrad consists of 1) offline valuation and auditing, in the case of mining projects, the valuation process involves the testing of ore samples from every mining cycle and publishing valuation reports, 2) online issuance, the sales of nodes, asset disposal and other activities that are related to the distribution and exchange of asset tokens and 3) on-chain trading and transfer of asset tokens and its derivatives.

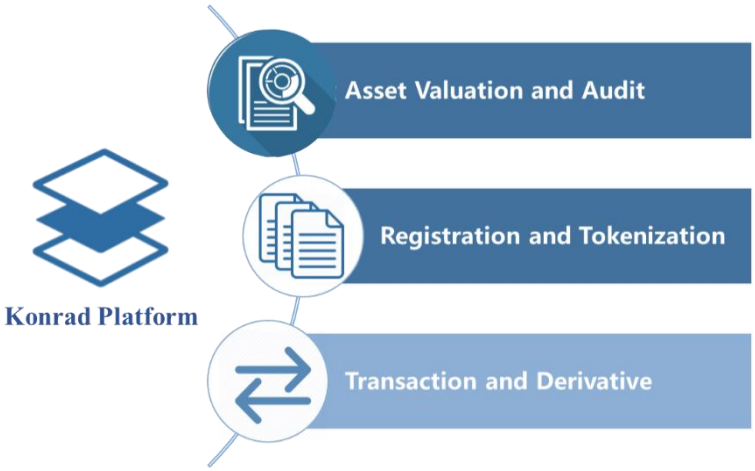


Figure 1. Konrad Platform

3. Technical Architecture

Asset tokenization is originally designed to provide solutions to existing problems in asset registration and exchange, including long transaction process, low efficiency, trust issues, high asset management costs etc. However, the implementation of asset tokenization still faces pertinent issues such as asset authorisation and valuation, the mapping of asset on chain, asset fractionalisation and legal & compliance. In this chapter, we will elaborate on how Konrad targets the pain points of various processes of asset tokenization specifically, and in turn provides innovative technical framework as viable solutions.

3.1 Asset Valuation and Audit

Susceptible to the influence of multiple factors, raw materials need to be valuated at a regular interval. Hence, the Konrad platform will engage research laboratories to carry out raw material valuation on a regular basis. However, on Konrad platform, the final price of tokenised raw materials will be determined by a third-party auditing team to ensure that the lab valuation accurately reflects the worth of these materials. Meanwhile, the actual value of raw materials is also heavily influenced by relevant laws, regulations and taxation policies in the country or regions where these raw materials are located. In view of these external factors, a distributed, autonomous legal and tax community is built on the Konrad platform, providing comprehensive and fool-proof asset valuation and audit through specialised, cross-regional services, as shown in Fig. 2.

Fig2 The Construct of Asset Valuation Estimation Report

Through the comprehensive evaluation of the reports from laboratories, the third-party audit agency and legal expertise, the Konrad platform will provide an immutable, extensive and dynamic asset valuation report. In addition, our team has designed two specialised self-organising communities, to guarantee the provision of decentralised asset valuation services.

3.1.1 Konrad Asset Valuation and Audit DAO

Asset auditing process will proceed on a self-organizing online community convened by Konrad for the purpose of third-party auditing after laboratory analysis and evaluations are completed. The online community is open to all third-party agencies, from which a third-party audit pool is formed, after they have applied and been approved for membership status. Whenever an audit request is opened for bidding, all members can apply for the assignment. Members with higher credit rankings enjoy greater priority. In the meantime, when the number of assignment applicants exceeds a predetermined threshold, a random balloting mechanism will be activated to determine the final third-party auditing committee (the audit node) as a preventive measure against collusive fraud.

The Konrad Platform deploys a price feedback mechanism to facilitate the auditing process. In the feedback mechanism, multiple audit nodes will be involved in the evaluation of lab reports. As a result, the prices of raw materials are determined by the average of all prices quoted from different nodes. Once the average price is determined, the lab report will be signed, and the final price will be officially announced on the Konrad exchange platform. Konrad platform users can access these lab reports with their public key. An incentive system is also introduced to the audit nodes to ensure a fair and reasonable valuation of raw materials. The node whose proposed quote is the closest to the final price will be rewarded in KDX tokens. On the other hand, the proposal that deviates most from the final price will be penalized. Through the reward and punishment system, all nodes are encouraged to propose the most accurate price offer, and to deter any malpractice of the rights to quote.

As the self-organising community and the Konrad economy grow, we will design a more complex self-organising reward and punishment mechanism in the Konrad ecosystem with relevant models based on evolutionary game theory and behavioural economics, so that the Konrad asset evaluation and audit DAO will establish new balance between decentralisation, high efficiency and performance.

3.1.2 Konrad Asset Legal & Compliance DAO

In the process of raw material tokenization, we must be mindful of the disparaging regulatory policies in various countries, especially when it comes to regulations related to natural resources. Otherwise, it will bring immeasurable risks to asset valuation and estimation. For instance, in some regions, there are regulations mandating the procedures of asset transfer, and stringent asset registration processes under government regulation. These regulations are not in line with the token system. Therefore, Konrad Platform builds a legal compliance DAO. The detailed flow is illustrated in Fig. 3. An information sharing incentive mechanism is designed to cater to the legal minds from all over the world, and to solve the issue of legislation disparities among different countries. Therefore, the legal consultant costs are greatly reduced while the legal risks during asset valuation are also reduced.

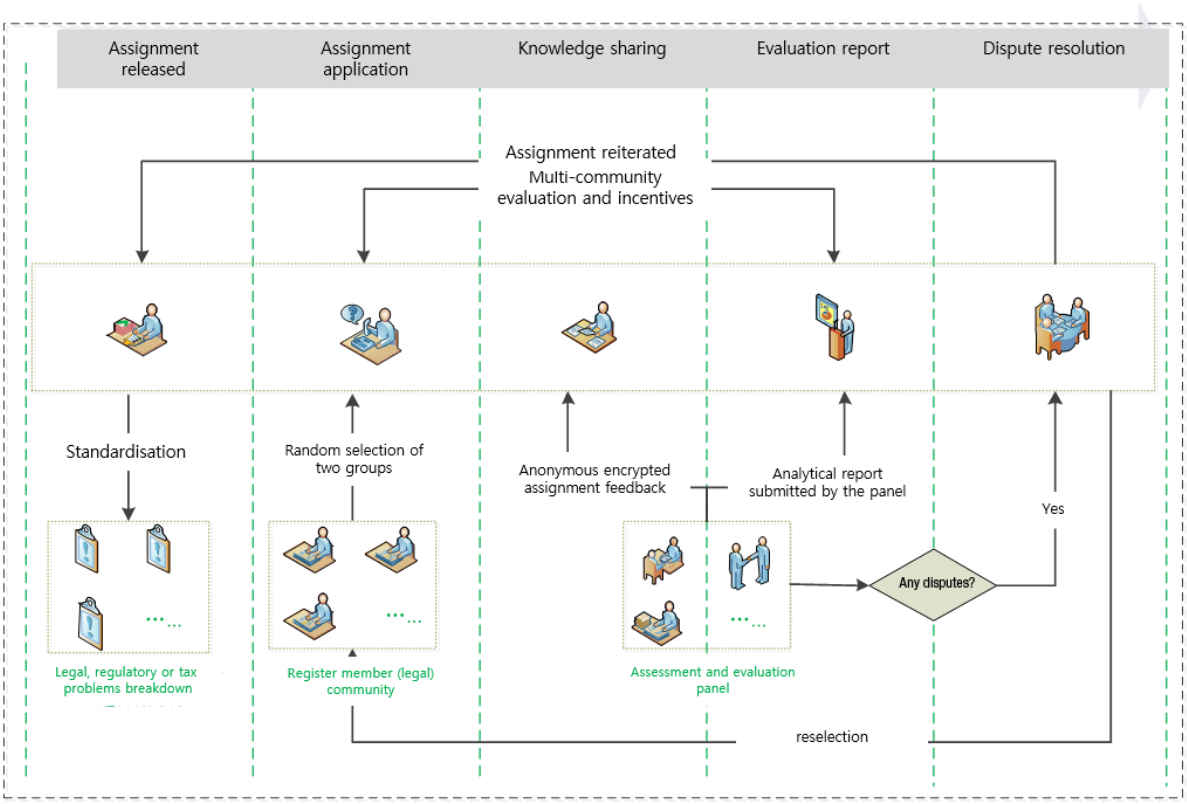


Fig 3 Asset legal & compliance Dao flowchart

Legal & compliance is the most crucial requirement throughout the tokenization process. ----Konrad platform has raised the standard of legal & compliance since the initial stage of asset tokenization. In addition, the legal & compliance assessment in each phase has been included in the asset valuation report. In the asset valuation and audit phase, legal & compliance DAO solves legal issues in the affirmation of asset ownership and asset valuation (i.e. the legal feasibility of raw material tokenization).

3.2 Asset Registration and Tokenization

Raw material registration and tokenization include the affirmation of ownership, asset valuation, asset mapping and registration, asset fractionalisation, and token optimisation. We have proposed and discussed in length about the innovative mechanism to facilitate the affirmation of ownership and asset evaluation. In this chapter, we will focus on asset mapping and fractionalisation during the process of tokenization and examine existing technical problems and business model challenges before offering our unique solutions.

3.2.1 Asset Mapping Mechanism

Accuracy is crucial to asset mapping. Konrad platform has designed a two-layered verification model to secure the accuracy of asset mapping. The accuracy guarantee is two-fold, namely the affirmation of ownership and anti-counterfeiting system. The affirmation of ownership refers to assigning enough authorisation protocols in the ledger to define ownership, the transfer

of licence and issued assets. Asset issuer is defined according to the general user guideline (based on public key infrastructure, KPI or other technology on blockchain). Regulatory institutions can ascertain the identity of the issuer by co-signing with asset issuer, or presenting the issuer with a digital certificate; anti-counterfeiting system refers to the authentication of real assets with chip technology, anti-forgery label and QR code etc. Once the asset is marked with a unique identifier, it will be authenticated with hash function and time stamp to prevent forgeries and thus acting as a proof of authenticity.

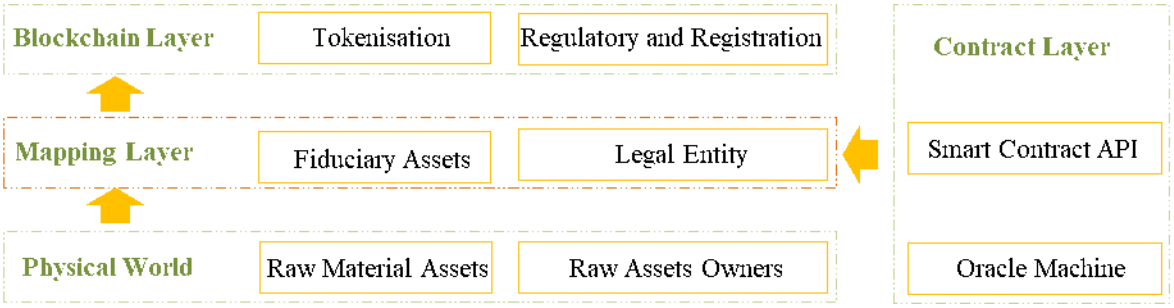


Fig.4 Asset tokenization mapping mechanism

After the accuracy of the asset mapping is ensured, the Konrad platform designs an asset mapping mechanism based on smart contract and oracle machine, as shown in Fig.4. The Konrad asset mapping mechanism consists of three layers. The physical world represents the initial states of raw materials; the mapping layer elaborates on tokenization mechanism while the blockchain layer documents the transaction data of tokenised assets. Lastly, the contract layer activates and facilitates the smooth collaboration among these three layers. Particularly in the mapping layer, we employ a trust fund model to manage asset and resolve issues pertinent to tokenization and the fractionalisation of tokenised assets.

3.2.2 Smart Asset Fractionalisation System

After asset mapping, trust fund becomes the main legal entity of the assets. Trust legal entity mobilises the smart contract and the tokenization template to proportionally fractionalise tokenised assets (as values of raw material assets are not evenly distributed) after classifying them into different categories. Values will be assigned to each share. Eventually, by purchasing tokens, token holders possess shares of ownership of the raw material assets. As illustrated in Fig. 5, smart fractionalisation is achieved by docking the smart contract API with the template library.

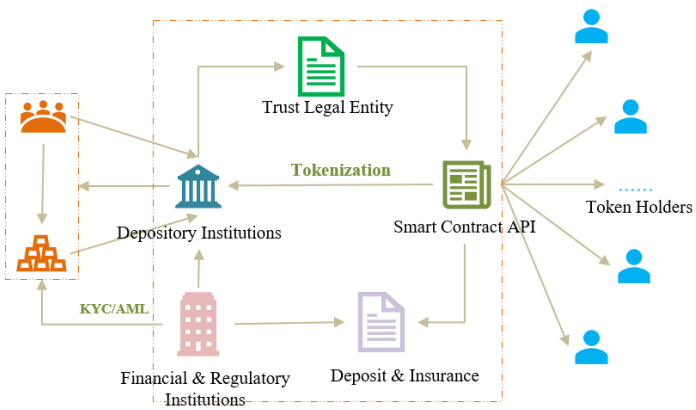


Fig.5 Smart asset fractionalisation framework

However, asset tokenization is not without its problems. For example, when a real asset is fractionalised, its ownership can be shared among a large group of individuals, who may not develop a strong sense of belonging on a personal level. As a result, who should take the lead in revenue collection and asset maintenance becomes a matter of importance. We develop a smart contract for deposit and insurance which enforces deposits and insurance from trust legal entity to reduce the risk of damages made to the initial assets. In addition, Konrad will develop more financial derivatives to thoroughly reduce similar risks.

3.3 Issuance and Transaction Platform

The issuance of tokens and transaction is the key to bring about value turnover of digital assets, which is also the last section of the Konrad tokenization platform. So far, we have centred around these three pillars in designing the infrastructure of Konrad platform. Meanwhile, we will select several key features in all three sections for consolidation or future smart upgrades, for instance, a smart contract library built upon a comprehensive consolidation of the smart contract templates from all three sections, and a smart risk control system upgraded from the existing risk control feature.

The Konrad platform is built on Ethereum public chain. Being a financial DAPP (specialised in raw material tokenization) imposes higher demands on both performance and the scalability of applications. Therefore, we initiated intensive upgrades and optimisations on the aspects of transaction performance and cross-chain scalability.

3.3.1 Konrad Raw Material Tokenization Platform

Raw material assets are at the upstream of the entire industrial chain. On one hand, there are few economic entities that are directly associated with raw material assets, thus impact factors within the economic system remains transparent. On the other hand, the original asset is seldom tested by other economic entities, making it rather difficult to determine the exact value of the original asset. Based on these strengths and weaknesses, we designed the Konrad raw material tokenization platform based on three pillars of asset tokenization.

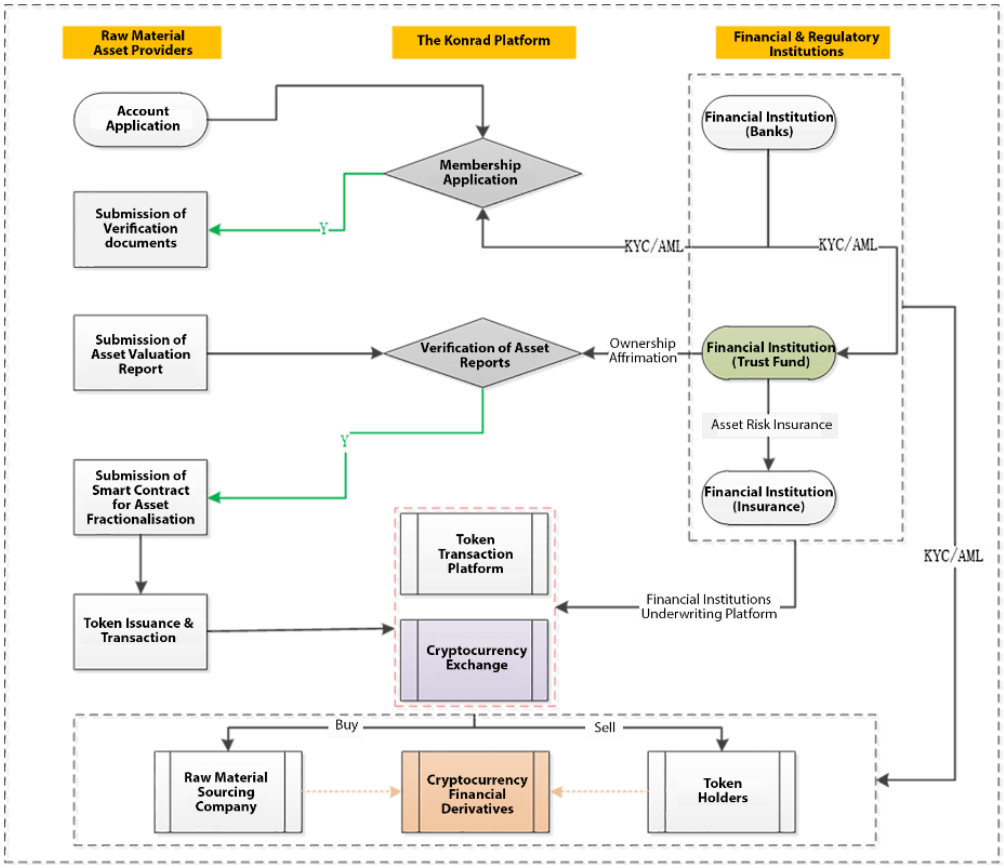


Fig.6 Konrad raw material asset tokenization platform framework

As shown in Fig. 6, categorised by the main entity activities participated by the tokenised assets, we can design an overall process framework comprising of the raw material asset providers, the Konrad platform, and the financial and regulatory institutions. Legal and compliance review spearheaded by membership requirement is the first transaction level. Asset valuation and audit as exemplified by asset audit report is the second transaction layer. Asset registration and tokenization epitomised by trust fund or other similar financial institutions is the third transaction layer, whereas token issuance and transaction represented by the token transaction platform is the forth transaction layer. Lastly, the scalability of token function, i.e. cryptocurrency financial derivatives, is the fifth transaction layer. The entire platform centres around these five transaction layers and in turn triggers the reward and punishment mechanisms in cryptocurrency to achieve liquidity of assets in the physical world, to accelerate asset turnover, and to increase the value of assets.

3.3.2 Smart Contract Function Library

The smart contract on the Konrad platform can be categorised into five groups, namely those related to KYC/AML, asset management, asset transfer, token and smart risk control (facilitated by the oracle machine) etc. We are developing various types of contract templates to enhance the user-friendliness of the platform. The graph below outlines a simplified model of our asset transfer contract.

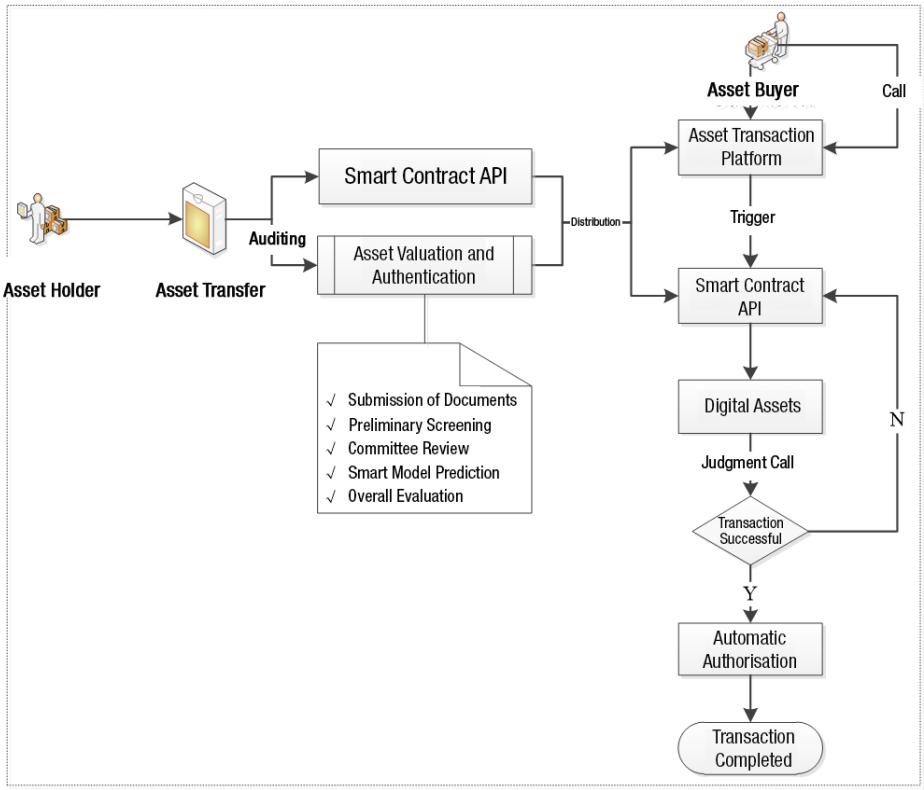


Fig. 7 The sample of transfer contract in Smart Contract Library

3.3.3 Konrad Smart Risk Management System

Risk management is the lifeline of any financial activities. Regardless of whether it is traditional or blockchain financial activities, it is crucial to go through layers of vetting and revisions to design a reliable risk control system. With the growing integration of AI technology in the financial sector, there are increasing opportunities and scenarios where new Fintech projects can be implemented. Therefore, the Konrad platform integrates both blockchain and AI technology to design a highly professional smart risk management platform. As shown in Fig.8, on-chain elements represent economic entities, whereas the off-chain computational model refers to financial big data and financial machine learning models. The risk management decision making process comprises of decision-making mechanisms targeting different business and operations. In addition, owing to the constraints of the Ethereum platform, Konrad has designed a risk management system based on smart contracts called by the oracle machine.

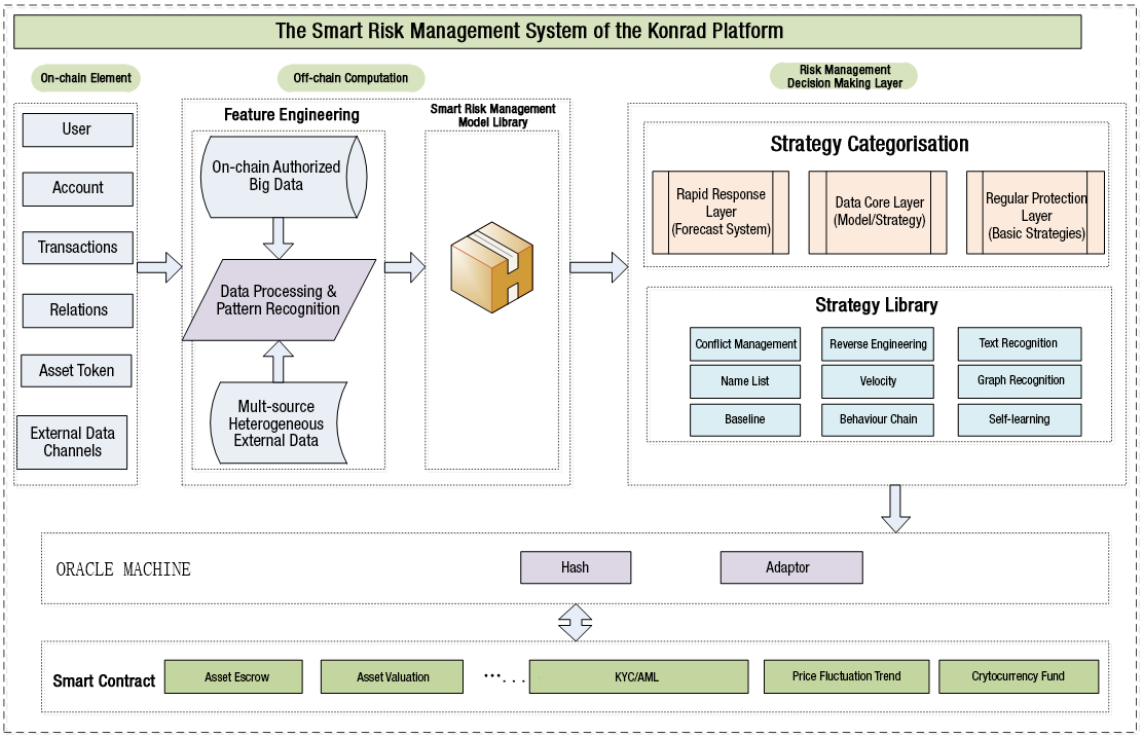


Fig.8 Konrad Smart Risk Control Framework

3.3.4 The Enhancement of Trading Performance

Konrad platform is currently operating on Ethereum, which enhances its processing capability by either sharding or through state channels. The Raiden Network, an equivalent of the lightning network of Bitcoin, is the consummation of state channel technology on Ethereum. The fundamental concept of Raiden Network is that users can exchange transfer signature privately, instead of handling all transactions on blockchain. Raiden Network preserves the insurance mechanism in the blockchain system with P2P payment and deposit mechanism in the Ethereum platform.

Raiden Network uses off-chain state network to scale up the transaction processing capability of Ethereum. Consequently, the Konrad platform operates concurrently with the Ethereum nodes through Raiden nodes, and connects to other Raiden and Ethereum nodes to facilitate transfer and deposit management.

3.3.5 The Scalability of Technology and Application

In terms of scalability, the current Konrad platform is based on Ethereum, but we will scale up to TrustToken, EOS etc. In the case of cross-chain, single asset can be released and locked on multiple chains. When an Ethereum user is transferring his share of ownership to a TrustToken user, the smart contract will automatically lock the shares on Ethereum and unlock the shares on TrustToken via off-chain data channels to complete the transaction. In addition, we will develop a blockchain browser that encompass the shares of ownership, both locked and unlocked, on every chain of one single asset, to make sure the total sum is conserved, and all information is made transparent and accessible to investors.

A system of mutual trust and mandatory access requirement lay foundation for digital assets issued by all parties to circulate widely and rapidly. We need to build upon the existing framework to develop a cross-chain exchange system which will in turn facilitate the cross-chain transaction and circulation of digital assets issued by different entities, and work towards sourcing liquidity for digital assets.

4. Token Ecosystem

4.1 Ecosystem and Platform Token

A utility token, Konrad Token (KDX) will be issued on the Konrad platform. KDX is a digital token based on Ethereum ERC-20 with a fixed supply that functions as a major value transfer agent and universal equivalent in the Konrad Ecosystem. KDX can be used to pay the fees of various activities and transactions including but not limited to asset validation, asset auditing, on-chain registration, trading and exchange. In the meantime, KDX is used to purchase network nodes of asset digitalisation project.

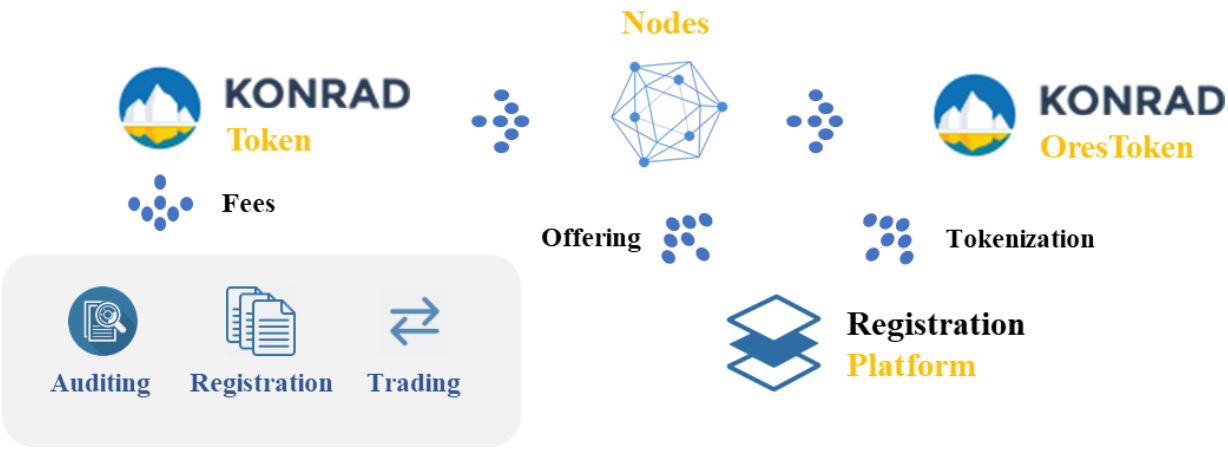


Figure 9. Konrad Token

4.2 Node Offering and Block Reward

The South Fiord Dome Property will sell its own network nodes through the Konrad Platform. Newly minted commodity tokens will be in part distributed to various network nodes in accordance to network priority after the completion of sampling, drilling and the recovery of gravity equipment in each mining cycle. KDX token holders can use KDX tokens to purchase network nodes of the registered asset. The priority of network nodes is related to factors such as the number of corresponding KDX.

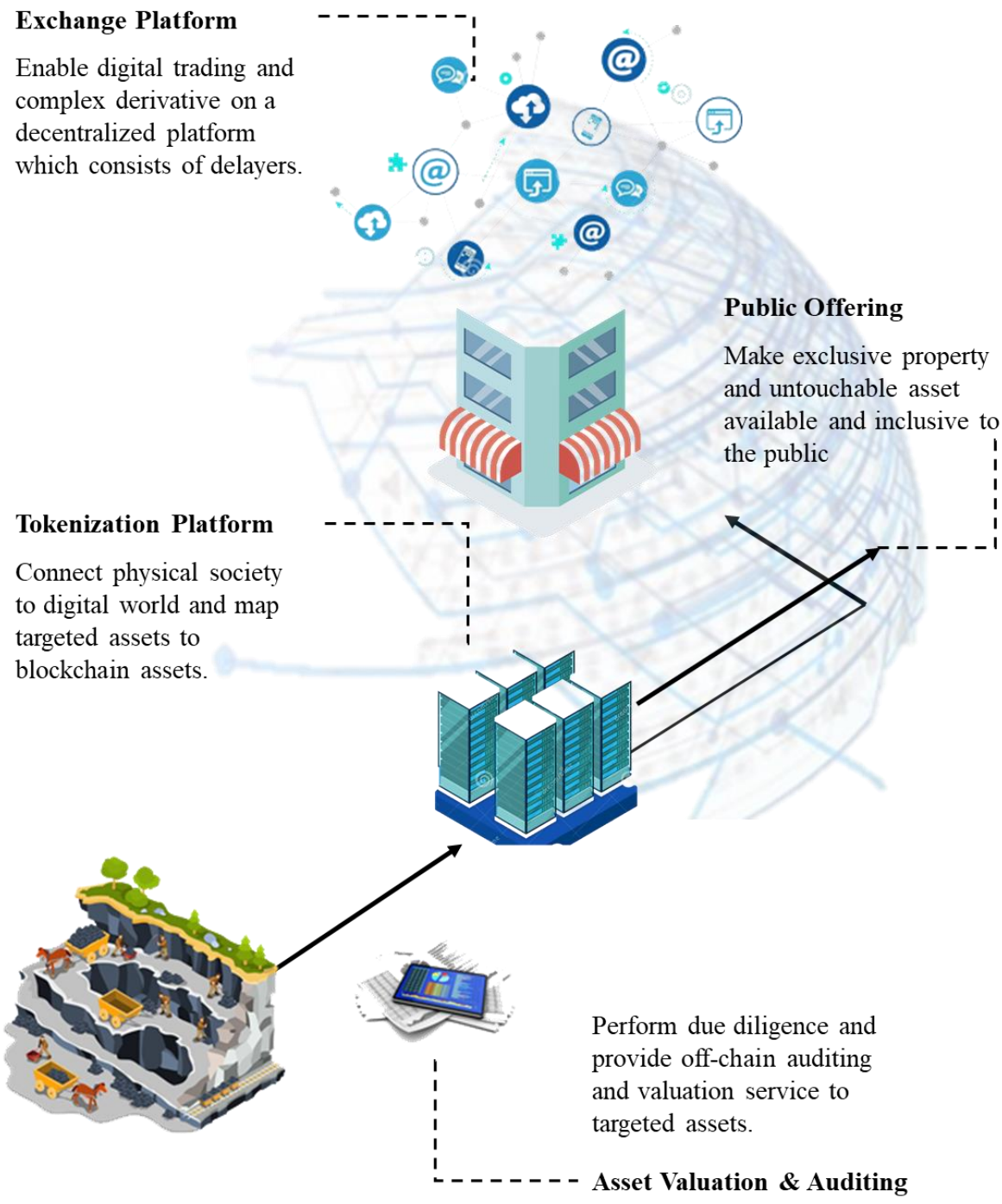


Figure 10. Konrad Platform Ecosystem

5. Road Map

Konrad Platform will be prepared in a careful and timely manner to provide all necessary services to projects interested in exercising asset tokenization on its platform.

Figure 11. Road Map

6. 1st Application Case: Mining Projects

6.1 Existing Problems

The entire mining cycle of a mining project can be roughly divided into four stages: prospecting and exploration, development, extraction and reclamation. The details of each stage are shown below:

Stage	Duration	Activities
Prospecting & Exploration	1-10 years	Evaluation of the size, composition and structure of ore samples; social and environmental impact and efficient mining methods
Development	1-5 years	Planning and Construction Obtaining mining licences, construction of mining facilities and local infrastructure; logistic supports and operation requirements
Extraction	2-100 years	Mining and extraction to obtain gold and other minerals; mining plan reassessment based on changing market conditions
Closing & Reclamation	1- 5 years	The mining site will be shut down once the ores are depleted as continuing mining only bring losses. Disassembling the mining equipment and restoring the ecosystem; monitoring social and environmental impacts closely

As it can be inferred from the table above, mining is an arduous, resource-intensive industry. It usually takes decades to complete the process from surveying the site to ceasing the entire operation. Problems including low liquidity, longer return cycle and high operating costs are almost inevitable.

Despite having various ways to invest in minerals, traditional ways of investing in minerals bear several restrictions. Buying physical minerals poses relatively high entrance fees as the unit price of mineral is high. On the other hand, investment choices like Mineral ETFs and ETNs are available in various countries, but their liquidity is heavily affected by the market fluctuations. Various other means of investing in minerals are analysed in the following table.

	How	Strengths	Risks/Drawbacks
Gold, silver & Platinum	Precious metals are purchased from banks and companies	▪ Once the price of minerals surpasses the markup price, it can be sold for profits	▪ Storage space ▪ Subjected to taxation varying from jurisdictions
ETFs	Buying Exchange-Traded Fund from exchanges using one's security account	▪ No physical restrictions ▪ Various kinds of funds ▪ Relatively low barriers to entry	▪ Taxed like collectibles ▪ Liquidity
ETNs	Buying Exchange-Traded Notes from exchanges with one's security account	▪ No physical restrictions ▪ Relatively low barriers to entry	▪ Credit risk ▪ Liquidity ▪ Fewer options for income investors ▪ No principal protection

Buying and Selling precious materials	Buying precious metal in various forms and prices like coins or jewelry	▪ Once the price of the precious metals exceeds the markup price, it can be sold for profits	▪ High premium, which amounts to 75% of the markup price ▪ Storage space ▪ Difficult for the inexperienced to differentiate the genuine from the counterfeit

6.2 Solutions

Konrad will create an asset register both offline and on the blockchain for ores mined from various mining projects, starting from Pisgah Crater Project from US, followed by two mining projects based in Canada, and then South Fiord Dome Project[1].. It aims to construct a digital economy on a decentralised platform to provide solutions to the aforementioned problems such as long return cycle and a lack of transparency and liquidity.

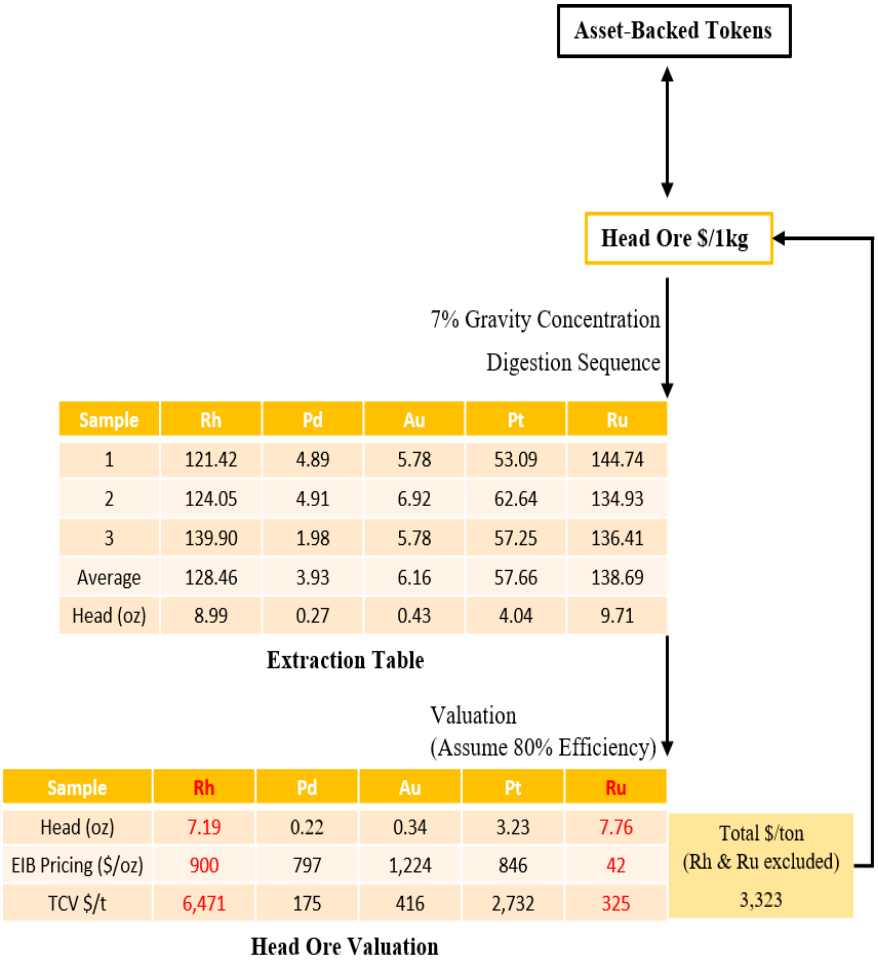
Leveraging on the immutability and transparency of the distributed ledger, Konrad will register and store crucial information including lab reports on ore composition, valuation and audit reports and corresponding hash values in the block generated for tokenized assets. In addition, Konrad requires the mining projects to publish monthly reports to guarantee the cashability and payment capability of the asset tokens issued. Konrad provides a highly effective and transparent value transfer network for the mining site, extraction companies, investors and other stakeholders within the ecosystem, offering positive feedback to various contributors.

Investing in ETFs of precious materials like platinum or palladium is generally less appealing than investing in gold ETFs due to the low liquidity. However, by constructing an online asset register backed by the safe and trustable blockchain technology, Konrad renders trading, division and transfer of assets more convenient, secure and traceable.

[1] Please refer to Appendices for more information on the mining projects.
- Appendix A: Pisgah Project
- Appendix B: South Fiord Dome Project

6.2.1 Content Analysis and Sample Valuation

At the start of each mining cycle, Konrad Lab conducts sample tests for the ores mined at the mining sites while predicting the value of the ores based on the extraction table. Bulk samples of each mining cycle will be taken from the 7% Gravity Concentration and tested using the Digestion Sequence ((HCI-Wash to remove base metals followed by AR Digestion to dissolve all metals)). Using prevailing Engelhard Industrial Bullion (EIB) pricing, the Total Composite Valuation (TCV) of Concentrate Recoverable Metal is determined by the average raw counts of soluble metals digested of each sample. In this way, we can easily determine the valuation of head ore in each mining period.



Sample	Rh	Pd	Au	Pt	Ru
1	121.42	4.89	5.78	53.09	144.74
2	124.05	4.91	6.92	62.64	134.93
3	139.90	1.98	5.78	57.25	136.41
Average	128.46	3.93	6.16	57.66	138.69
Head (oz)	8.99	0.27	0.43	4.04	9.71

Extraction Table

Sample	Rh	Pd	Au	Pt	Ru
Head (oz)	7.19	0.22	0.34	3.23	7.76
EIB Pricing ($/oz)	900	797	1,224	846	42
TCV $/t	6,471	175	416	2,732	325

Head Ore Valuation

Figure 12. Valuation

Based on the above extraction table, the average content of different mineral types for each sample is 128.46oz/ton (Rh), 3.93 oz/ton (Pd), 6.16 oz/ton (Au), 57.66 oz/ton(Pt) and 138.69 oz/ton (Ru). Since the bulk sample is extracted under the condition of 7% Gravity Concentration, we can obtain the value of head ores to be 7% of the average values. From then on, TCV values can be calculated by multiplying the value for head ores with EIB pricing for each material. For the computation of TCV values, 80% of efficiency is assumed for value of head ores obtained from the samples. While the values of Rh and Ru require further testing, the value of the original ore (including Au/Pt/Pd) is estimated to be USD3323/ton in the current round of assessment.

$$Head\ Ores\ (oz) = Average\ mass\ of\ each\ metal * Gravity\ Concentrate\ Coefficient(0.07)$$

$$TCV = \frac{\sum_j^m \sum_i^n Content\ of\ Mineral\ Type\ (i)\ in\ Sample(j) * EIB\ Pricing(i)}{m}$$

In every mining cycle of the mining projects, we will disclose reports of the laboratory test results and the valuation of the ores, and publish relevant hash values on the blockchain network.

6.2.2 Asset Registration and Tokenization

According to the composition analysis report (Value Estimation Report) and the yield report generated from the Konrad Lab, we will issue the ores mined from the mining sites on Konrad platform, while carrying out the distribution and documentation on the blockchain platform and storing the corresponding hash values on relevant blocks. The asset register hash value consists of the composition analysis, yield report and time stamp. Owing to the immutability of blockchain technology, when an auditor accesses relevant valuation documents and reports, one can ensure that the asset registration information is not tampered with by accessing the corresponding hash value.

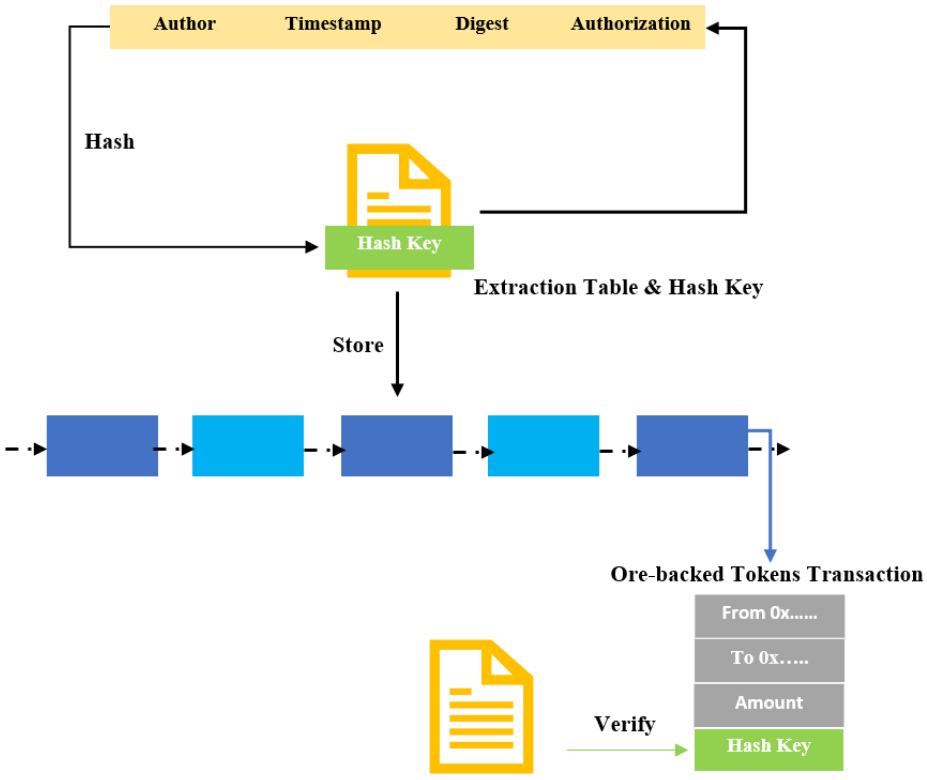


Figure 13. Hash Key and Traceability

Asset registration information of ore-backed tokens issued by mining projects will be attached to the block created. This token will be a digital asset endorsed by physical assets whose value is equivalent to unit mass of crude ore.

6.2.3 Asset Trading and Circulation

Asset-backed tokens can be divided, transferred, traded and even create more complex derivatives. These tokens will be traded on Konrad Asset Trading platform, a decentralised platform based on relay network. The trading process is elaborated below.

1. Trading rules such as trading service regulations are established on the relay network and booking service is provided for external uses
2. Maker selects the relay nodes to make payments by filling in essential trading and transaction information and signs the transaction with hash key.
3. Maker submits the signed order to the relay node at which orders are being checked on a compulsory basis
4. Taker selects the order from booking record and fills in the necessary information, before broadcasting it on the blockchain network.

During the transaction process, since only the booking phase is broadcasted in the network, the waiting time and cost for matching transactions are significantly reduced.

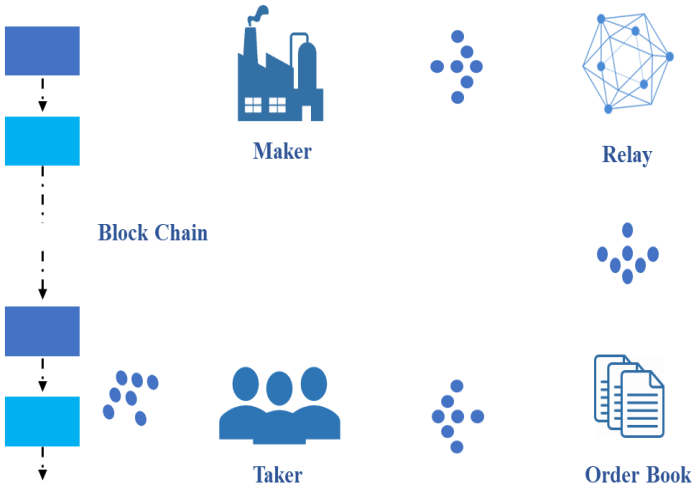


Figure 14. Konrad Exchange Platform

6.2.4 Cash Out and Disposal

Ore-backed token holders can cash out ores from the mining projects on the Konrad Asset Distribution and Disposal Platform. After the exchange is completed, the ore-backed tokens recovered will be immediately destroyed. In the actual production cycle, ore-backed token holders are required to exchange for raw ores within a limited time frame. Meanwhile, refineries are also encouraged to use ore-backed tokens as a payment instrument.

7. Konrad Team and Advisory

Peason Yeung Pok Man

CEO of Konrad, Marketing Director at Magellan Capital Limited

Peason has 18 years of experience in asset management, working for Lexton Wealth Management limited, Cinda Wealth Management limited and Centaline Wealth Management Limited(Beijing) as General Manager. Currently, he is a marketing director of Magellan Capital Limited, and is managing family trusts for clients. The total asset under his management at the present time amounts over 185 million USD. During his stay in Beijing, he was heavily involved in three pre-IPOs that were conducted in Hong Kong.

He graduated with Dean List from University of Washington in 2001. Thanks to his major in Finance and Information System, he demonstrates a strong expertise in preparing and analysing business models.

Peason will be overseeing the delivery of the whole project and provides his guidance and expertise on fundraising.

Ben Ng Wing Pan

Sinostar concept Ltd.
General manager
North Pole Mining Ltd.
Vice President

Ben is responsible for the purchase of gold, Rhodium, Platinum, Palladium, Silver, Copper, Nickel everyday from the refining company like Heraeus.

He managed a team of 4 peoples to closely monitor the precious metal daily pricing, prepare the Inventory management. And also manage another team to perform Lab test, take care the Recycling of scrap for environment protection concern.

Ben will be in charge of mining report, daily operation and fundraising.

Matthew Hum

CTO of Konrad

Having 26 years of experience in Computer Science, Matthew possesses in-depth knowledge in computing including configuring, installing, training and maintaining PC Systems and Network gear in a variety of operating environments with an emphasis on security. Especially, he is well-versed in reverse engineering and analysis of malicious technology and software. He has diverse experiences in the field of computing, as a programmer, solutions engineer, systems engineer, solutions consultant and chief technical officer. Notably, he previously worked extensively with US Department of Defense (US DOD), US Department of Homeland Security (US DHS), and several other government agencies.

Matthew graduated from Northeastern University, Boston with a major in Electrical and Computer Engineering and minor in Mathematics. He is certified with CWSP, CWNA, CWTS and ECA.

With his unparalleled expertise in computing and security, he would be providing guidance on the development of Konrad's platform and operation and maintenance of the platform.

Edward Mausolf

Research Director

Edward has significant experience handling, extracting, processing, recovering, and purifying technetium compounds relevant to its parent isotope Mo(VI) as pertechnetate, technetium dioxide, or technetium metal and its high temperature alloys which was gained during his tenure as both a student and Associate Professor at the University of Nevada, Las Vegas (UNLV). He has reprocessing experience on the gram quantity scale of technetium as separated from the kilogram scale of uranium as uranyl nitrate.

He has studied the interaction of molybdenum as a potential nuclear waste form for cesium and iodine in high burn-up fuels for TerraPower and studied the forensic behaviour of radioiodine in the same fuel matrix involved in the GMIS proposed system during his time at the Department of Energy (DOE) National Laboratory Pacific Northwest National Laboratory

(PNNL) where he was graded as a Full Scientist III, a Department Professor Joint Appointee, and represented Radiation Workers while seated on the Hanford Advisory Board (HAD) after being appointed by the DOE.

Edward will provide support to determine and identify batches of samples using current scientific testing's of the South Fiord Dome Gabbro and will manage continuing Research and Development efforts.

Lee, Bernard Pun Lap

Chairman of Technical Advisory Board

Bernard is the co-chair of Sustainable Business and Management Division, World Institute of Sustainable Development Planners. He is the founder of Road Logica International Limited, Hong Kong and Co-founder Procuro Inc., USA. He was invited to be the guest speaker of various honorable events, few of which to be named are World Expo Shanghai 2010 and ASEAN Forum 2010.

Bernard graduated from University of Washington, and obtained his master in the University of British Columbia, Vancouver, Canada.

Bernard will use his expertise and unmatched experience to supervise technical operations involved in the execution of the project.

James Hason

Metallurgist and Geology Consultant

James has over 25 years of field experience prospecting for mineral deposits, developing both placer and hard-rock projects and conducting recovery testing for a multitude of clients.

He helped pioneer the introduction of the Super Leach chemistry using Saturated Salt and Nitric Acid (SSN) in the 1990's and has extensive experience performing Leach and Smelt Extraction procedures to maximise recovery of precious metals from mineral concentrates.

He is a founding Director of Archemetrix International and leads it's Metallurgical Research and Development efforts in the USA and Canada.

James will support the Extractive Metallurgy testing of the South Fiord Dome Gabbro and will manage continuing Research and Development efforts.

Scott Bramwell

Process Engineer and Research Coordinator

Scott's work spans a number of industries including Wireless Telecommunications, Renewable Energy and Mineral Processing.

He combines his formal training in research design and documentation with field experience supporting technical projects across Europe, Africa and North America.

He currently manages a Mineral Processing Facility for G9 Minerals in Arizona and works directly with industry partners such as FLSmidth, SGS and Inspectorate to coordinate Qualitative and Quantitative Analytics.

Scott will support the Mineral Processing testing of the South Fiord Dome Gabbro and will organize project documentation and reporting for shareholders.

8. Appendix A: Pisgah Crater Project

8.1 Introduction

The Pisgah Crater located near Barstow, CA in the Mojave Desert is a privately-owned asset of Can-Cal Resources and has been the subject of exploration interest for many years. Therefore, James Hason, a Can-Cal shareholder and Director of Archemetrix International, requested an independent evaluation of bulk, chain-of-custody samples for the purpose of determining the feasibility of continuing Research and Development efforts including future Pilot and Commercial Processing of the raw material.

Figure 15. Pisgah Crater's mining site & it's satellite view

8.2 Mineral Collection for Content Evaluation

The first round of batch testing confirmed that dense minerals and metallic particles can be liberated from the Pisgah Cinders which carry commercially-valuable metals as determined by standard Fire Assay Recovery testing. Additional rounds of batch testing were conducted to establish fractional yields and provide a mass balance accounting needed to determine economic feasibility.

The following procedures have been used for extracting and testing mineral contents for the samples collected from the two different sampling areas at the mining site.

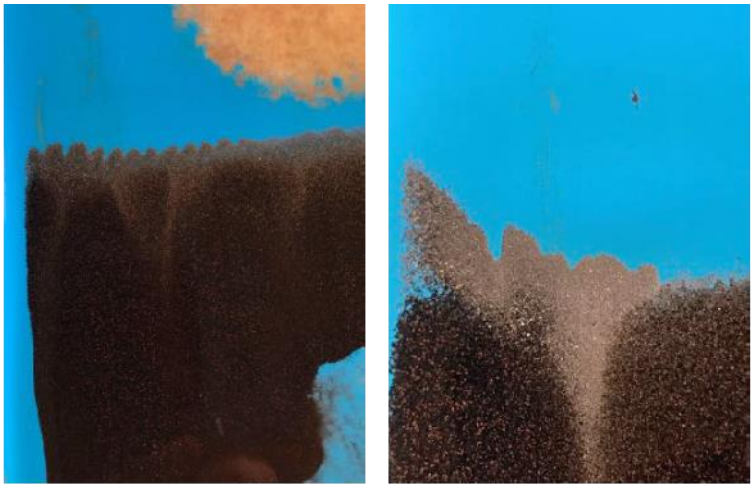
a. Sampling Distribution

Figure 16. View from crater flank showing distribution pattern of sample buckets to ensure representative collection of targeted area.

b. Pilot Processing

Figure 17. Pilot Processing Circuit in Arizona used for Bulk Testing of raw materials, prior to Treatment and Separation stages.

c. Gravity Separation



Treated sample submitted to Gravity Separation on Wave Table

Close-up shows metallic particles co-mingled with dense minerals

Figure 18. Dense minerals and metallics are separated by gravity separation

d. Magnetic Separation

Figure 19. Medium-intensity magnetic separation producing magnetic materials(left) and non-magnetic materials(right)

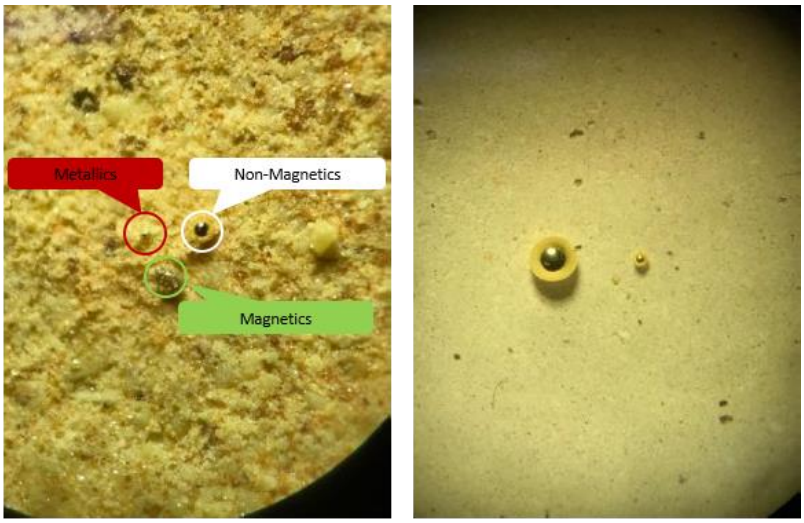
e. Lead Fusion Fire Assays

Final Stage of lead removal by cupellation at 1700 F in furnace.

Visible gold bead recovered in hot cupel with all lead removed.

Figure 20. Metallic, Magnetic & Non-magnetic materials are put in cupellation furnace to recover minerals

f. Metal-in-Hand Recovery



Au beads recovered from various types of materials

Batch 2 Bead(left) next to smaller Batch 1 Bead(right)

Figure 21. Au beads recovered from each fraction of the Concentrate

8.3 Mineral Content Analysis

Evaluation of the volcanic cinders from the Pisgah Crater Property in California has revealed several important characteristics. In terms of material conformity, the cinders from the 3.5 million-ton screened area appear to be remarkably homogenous in terms of size and composition, and contain range of metallic and mineral fragments that are the target of mineral processing activities.

Formal Grind Testing should be pursued in order to determine optimal grinding conditions and liberation thresholds for the metallic and mineral fragments that comprise the value-bearing Concentrates. While incomplete grinding in the preliminary testing has produced only partial

liberation of these target fragments, the present recoveries indicate a minimum yield of 0.5% (200:1 Concentration ratio) which we expect can be improved with optimized grinding.

Liberated Concentrate Au grade appears to fall between 14-18 oz/ton. Using a 500 grams/ton Grade Average along with a 200:1 Concentration Ratio, an estimate average recovery of 2.5 grams/ton in the raw pumice (head ore) is expected. A baseline 2.5 grams/ton recovery supports $100/ton net revenues in Commercial Production, given that the operating expenses(OPEX) are kept below $20/ton.

9. Appendix B: South Fiord Dome Project

9.1 Introduction

The South Fiord Dome Property is located in western Axel Helberg Island, Nunavut Province, Canada. The property consists of 10 adjacent mining resources and covers an area of 22,723 acres which is 100% owned by North Pole Mining Ltd., a private company based in Burnaby, British Columbia.

The South Fiord Dome Project in the Canadian Arctic is initiated by North Pole Mining, a private company founded in 2011. The project is dedicated to the exploration, mining and extraction of rare metals in the region. The project is undergoing its first phase of exploration.

The samples mined from the site has undergone lab tests to study the composition of the deposits. From the lab recovery tests, it has been concluded that the region contains rare minerals including gold, platinum, bauxite, strontium, palladium with a relatively high density.

An application for 43-101 National Mining Certificate has been filed to carry out official mining activities within the Canadian jurisdiction.

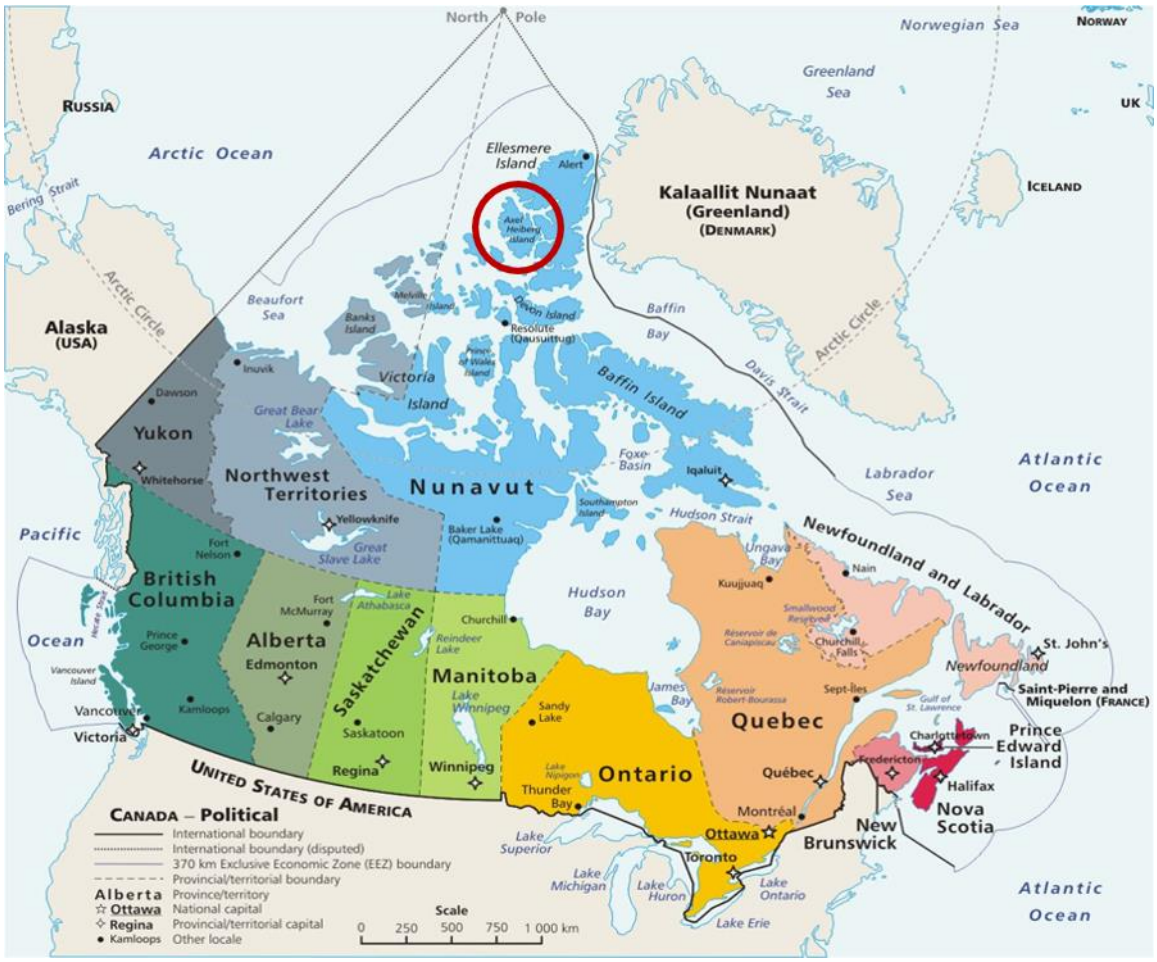


Figure 22. Location of Axel Heiberg Island

9.2 Geographical Characteristics

Located in the Sverdrup Basin formed by deposition of clastic rocks from the Carboniferous to the Eocene period, the property spans across the entire South Fiord Piercement Dome, a Carboniferous (Pennsylvanian) diapiric structure approximately 6 by 7 km in size that rose through the stratosphere to its current surface position surrounded by the Lower Cretaceous Isachsen Formation. The diapir comprises of gypsum, anhydrite and dolomite rocks which have been intruded by numerous gabbro dykes and sills related to the 129-127Ma phase of the Alpha Ridge volcanic activity. The host-rock lithologies of the South Fiord Dome provides an excellent environment for the deposition of precious metals such as gold and PGE (Platinum Group Element) metals.

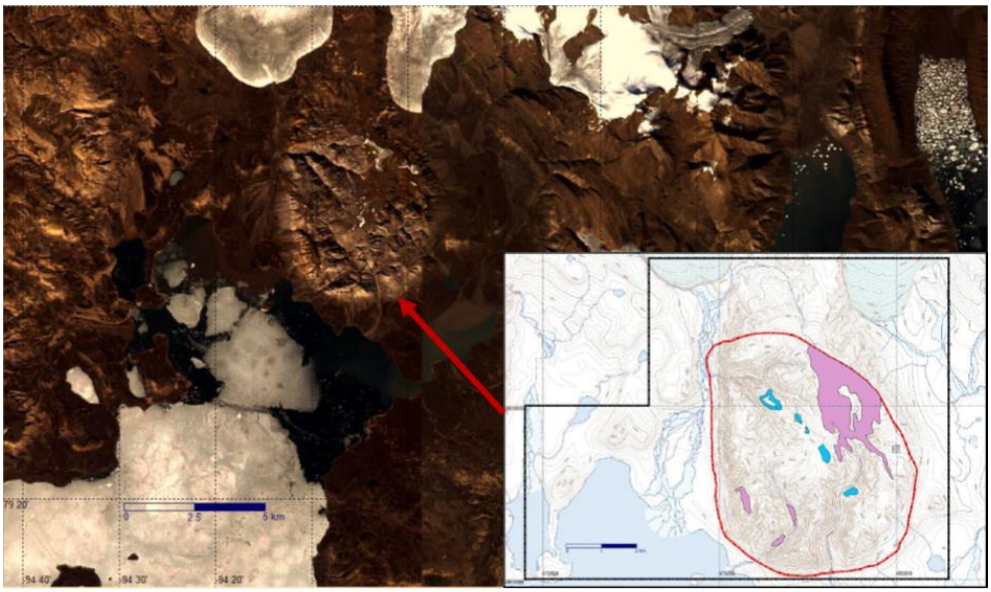


Figure 23. Location of South Fiord Piercement Dome

The mining spot is in the extreme North of the basin, a unique geographical location. Under the influence of extreme weather conditions, the region has many physical limitations that hinder the flourishing of mining operations. The mining zone is accessible only by air and sea. Mining activities can be carried out from April to September exclusively, when the weather is relatively mild.

On the other hand, under the influence of extreme weather conditions, the area is mostly uninhabited. As a result, these areas have never undergone mining in the past despite of its substantial mineral deposits.

9.3 The History of Exploration

The very first investigation of the region was led by Dr. W.D. Groves, who pointed out that the site could contain as much as 390 million tons of outcrop ore. Since the acquisition of the land in 2007, there has been two seasonal field campaigns conducted to study the mineral reserves of the site. The first journey of exploration was embarked in July 2007, during which 320

kilograms (700 pounds) of rocks were collected on a grid and shipped to Vancouver for further investigation.

From August 23rd to September 11th, 2011, an eight-membered team consisted of two prospectors and six miners assembled approximately 50,000 pounds of rocks from 84 sample points (S1-S84). These samples were shipped to Langley, British Columbia, where they were stored and sorted. Selected samples were sent to different laboratories for further testing and analysis. The long and arduous investigation stage has been completed in 2012.

9.4 Mineral Content

Sub-samples were sent to laboratories in the United States and China for further study and analysis by XRF, SEM-EDS and ICP. ICP analysis completed in the Copper State Lab turned out to yield the most significant results, of which seven samples yielded 2.811 - 5.006g/t Platinum and among them one yielded up to 22.149g/t Platinum. The presence of gold and PGE minerals was detected through SEM-EDS analysis in four major types of rocks, namely gabbro, anhydrite, gypsum and dolomite. These results indicate that there is a substantial reserve of gold and PGE minerals and that the South Fiord Dome property is a highly viable host of Au-PGE mineral deposits.

The detailed analysis of the ore samples extracted from the mining site is illustrated in the table below. This data was obtained by using inductively coupled plasma atomic emission spectroscopy (ICP-AES). The maximum valuation of the ore samples is determined by the prevailing Engelhard Industrial Bullion (EIB).

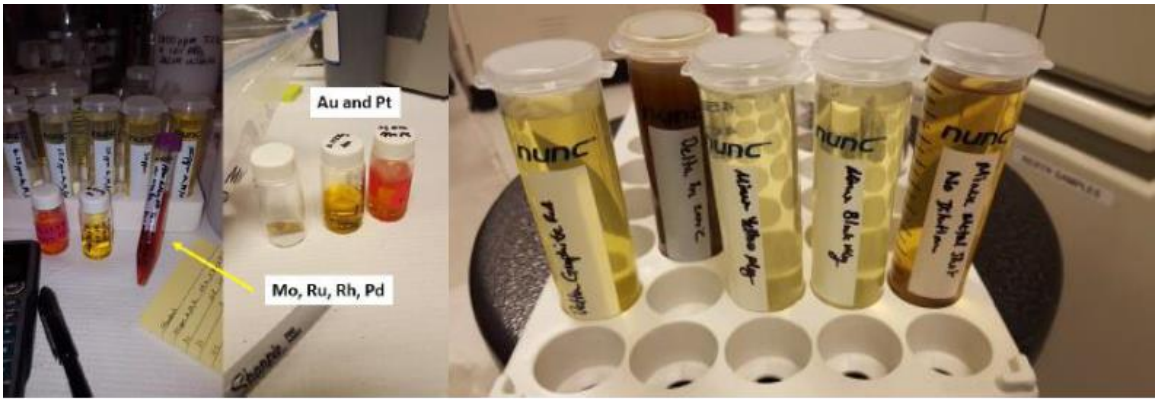


Figure 24. Lab Samples

Mineral Type	EIB pricing($/oz)	Content (oz/ton)	Pricing($/ton)
Au	1244	0.34	416
Pt	846	3.23	2,732
Pd	797	0.22	175
Rh	900	7.19	6,471
Ru	42	7.76	325
Total	-	-	3,323

Figure 25. Average Content of Ores

In the table above, the composition and valuation of Rh and Ru elements need to be agreed among the extraction companies and validated by further testing. Considering the components of Au (Gold), Pt (Platinum) and Pd (Palladium) in the sample ore, the ore is priced at 3323 USD per ton. To constantly update investors with the output of the mining site and evaluate the economic value of mining activities, more batches of ore samples will be sent for professional analysis and experimentations. In addition, the monthly reports will also incorporate the results of sample testing and the monitoring of mining activities on site.

9.5 Projected Value of Ores

Based on the sample extracted from the mining site, the estimated valuation of ores has been rated to be USD$ 3,000 per tonne. Further projection of ore values in subsequent mining years has been stated in the table shown below. However, this estimation is deduced from Rough Order of Magnitude (ROM, -25% to +75%) and the rate is also subject to various factors such as world economy health at the time of mining and the price of different types of precious metals. It is also important to note that the projection stated here is not final and could also be adjusted depending on the progress in the acquirement of NI43-101.

Year	ROM (USD$)	Tonnes
2019	Explorations and securing NI43-10	
2020	$ 96M	32,000
2021	$ 192M	64,000
2022	$ 288M	96,000
2023	$ 384M	128,000
2024	$ 480M	160,000
2025	$ 576M	192,000
2026	$ 672M	224,000
2027	$ 768M	256,000
2028	$ 864M	288,000
2029	$ 960M	320,000

Figure 26. Projection Value for Ores in the next 10 years

9.6 Operation

As a conscientious effort to save the earth and support sustainable mining activities, the mining site is fully committed, and will continue making efforts to reduce pollution and minimise the adverse impacts of mining activities. Without stringent oversight, water contamination, deforestation and major disruption to the ecosystem are among several negative impacts on the environment that could be caused by dirty mining. Although the mining site is built on a plot of uninhabited land, rigorous safety measures and strict operation procedures will be put in place to reinforce the pursuit of sustainable mining activities.

During the stage of exploration, a green exploration programme will be facilitated by the employment of new technologies. Apart from the stage of exploration, the pursuit of sustainable development will also be prioritised by strictly complying to relevant regulations and operations standards to minimise the impact on the stratosphere and lower the carbon footprint while expediting water treatment, recycling (zero discharge) and using alternative energy sources such as diesel reserve.

9.7 Projected Operation Timeline

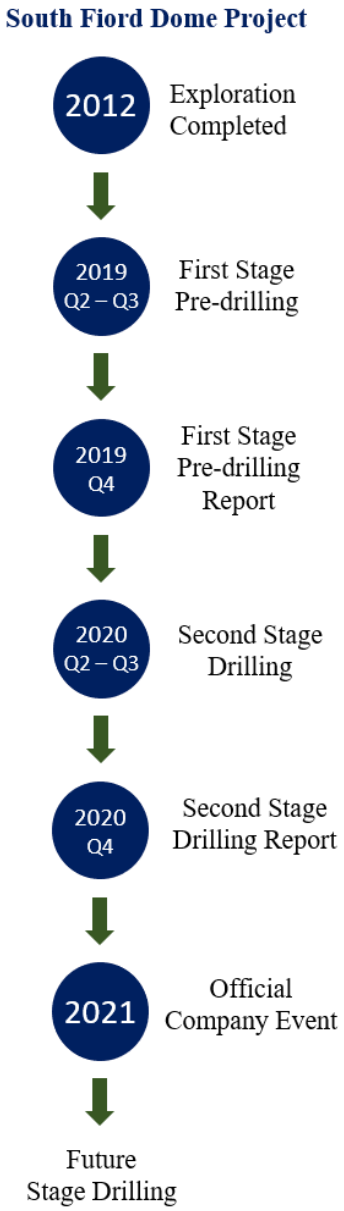


Figure 27. Projected Operation Timeline