# IPERIONX – TITAN PROJECT SCOPING STUDY

## *A LEADING, SUSTAINABLE U.S. CRITICAL MINERAL PROJECT*

**IperionX Limited (NASDAQ: IPX, ASX: IPX) (IperionX or Company)** is pleased to announce the positive results of the Scoping Study (Scoping Study or Study) on the Company's Titan Project (the Project) located in west Tennessee, U.S. The Scoping Study results demonstrate the Project's potential to be a sustainable, low cost and globally significant North American producer of titanium, rare earths and other critical minerals needed for a low carbon future.

IperionX has two businesses – our critical minerals business at the Titan Project, which is the subject of this Scoping Study – and our titanium metals business, where we are currently producing titanium metal powders and prototype parts using our patented titanium manufacturing technologies that have the potential to significantly reduce both the cost and carbon emissions of titanium production relative to what is commercially available today – a separate economic evaluation is planned to be released for project development activities associated with our titanium metals business.

**Scoping Study Parameters - Cautionary Statements**

The Scoping Study referred to in this announcement has been undertaken to determine the potential viability of the Project comprising a heavy mineral sand mine and wet concentrator plant and mineral separation plant constructed in Tennessee, U.S. and to reach a decision to proceed with more definitive studies. The Study for the Project has been prepared to an intended accuracy level of ±35%. The results should not be considered a profit forecast or production forecast.

The Scoping Study is a preliminary technical and economic study of the potential viability of the Project. In accordance with the ASX Listing Rules, the Company advises it is based on low-level technical and economic assessments that are not sufficient to support the estimation of Ore Reserves. Further evaluation work including infill drilling and appropriate studies are required before IperionX will be able to estimate any Ore Reserves or to provide any assurance of an economic development case.

Approximately 57% of the total production targets are in the Indicated Mineral Resource category with 43% in the Inferred Mineral Resource category. 100% of the production target in the first 14 years is in the Indicated Mineral Resource category. The Company has concluded that it has reasonable grounds for disclosing a production target which includes an amount of Inferred Mineral Resource. However, there is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work (including infill drilling) on the IperionX deposit will result in the determination of additional Indicated Mineral Resources or that the production target itself will be realized.

The Scoping Study is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding. While IperionX considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range outcomes indicated in the Scoping Study, additional funding will likely be required. Investors should note that there is no certainty that IperionX will be able to raise funding when needed. It is also possible that such funding may only be available on terms that dilute or otherwise affect the value of IperionX's existing shares. It is also possible that IperionX could pursue other 'value realization' strategies such as sale, partial sale, or joint venture of the Project. If it does, this could materially reduce IperionX's proportionate ownership of the Project.

The Company has concluded it has a reasonable basis for providing the forward-looking statements included in this announcement and believes that it has a reasonable basis to expect it will be able to fund the development of the Project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

## *SCOPING STUDY HIGHLIGHTS*

**Largest potential source of U.S. titanium and rare earths minerals, including heavy rare earths**

- Scoping Study confirms the potential for the Project to be the largest U.S. producer of titanium and the rare earth minerals, monazite and xenotime, which includes both light and heavy rare earths.
- In-situ metal content of titanium and rare earths over the life of the Project represents potential production of ~60,500 Boeing 787s and ~24,000,000 electric vehicles.
- Potential to satisfy 100% of the U.S. Department of Defense needs for titanium and the heavy rare earths required for national security.
- Opportunity for a rapid and low capex entry to the U.S. rare earth supply chain, utilizing Energy Fuels' existing White Mesa mill in Utah.

**Potential for significant cashflow generation including average annual EBITDA of US$117 million**

- Potential to develop a domestic source of critical minerals in the U.S. with significant cashflow generation underpinned by low costs.
- Compares favorably to global projects and is located in a leading jurisdiction significantly closer to a large number of end user facilities.
- Importantly, the Scoping Study do not yet consider the potential upside associated with integration of the Titan Project (minerals business) and the Company's breakthrough titanium metal technologies (metals business).

**Globally significant U.S. critical mineral resource with massive potential upside in the region**

- 100% interest in over 11,000 acres of titanium, rare earth minerals and zircon rich mineral sands properties in Tennessee, U.S.
- Production target of 243 million tons of mineralized material over a life of mine of 25 years covers less than 4,500 acres of the current land position controlled by the Company.
- Significant potential to grow production and Project life in the future.

**Infrastructure, location and decarbonized supply chain advantage to major target markets and end users**

- Significant cost advantages due to the location and proximity to existing low cost, world-class infrastructure.
- Major logistical advantage over many other critical minerals imported into the U.S. provides the potential for a further cost advantage and a lower carbon intensity supply chain.

**Sustainable and community focused development**

- Actively taking a "sustainable first" approach to all areas of development with a focus on zero carbon power, sustainable rehabilitation practices and community engagement.
- Building trust, broadening support, improving knowledge and promoting community participation and engagement in the development of the Titan Project.

**Rapidly progressing to be construction ready in 2023**

- Mineral demonstration facility at Titan Project being completed to facilitate feasibility test work, customer offtake discussions, downstream R&D and community engagement.
- Feasibility study metallurgical test work already underway after successful completion of pre-feasibility level test work in early 2022.
- Optimization for mine planning, processing and permitting pathway underway to facilitate a 2023 construction ready timeline.

## Key Scoping Study Metrics (US$)

| AFTER TAX $NPV_8$ | LIFE OF MINE ANNUAL EBITDA | AFTER TAX IRR% | DEVELOPMENT CAPEX | PAYBACK PERIOD |
|---|---|---|---|---|
| **$692M** | **$117M** | **40%** | **$237M**<br>Incl. 30% contingency | **1.9 YEARS** |

**All values in the Scoping Study are measured in metric units and are displayed in US$ unless specified.**

*Table 1: Key Scoping Study metrics.*

| Measure | Unit | Value |
|---|---|---|
| **Production** | | |
| Life of mine (LOM) | years | 25 |
| Mineralized resource mined | Mt | 242.6 |
| Annual average throughput | Mt/y | 9.7 |
| Annual average production – rare earth concentrate | t/y | 4,650 |
| Annual average production – rutile | t/y | 16,700 |
| Annual average production – ilmenite | t/y | 95,500 |
| Annual average production – premium zircon | t/y | 22,400 |
| Annual average production – zircon concentrate | t/y | 16,100 |
| **Operating and Capital Costs** | | |
| Unit operating costs (incl. royalties & transport) | US$/t ROM | 6.91 |
| Annual average operating costs (incl. royalties & transport) | US$M/y | 67 |
| Total initial capital cost | US$M | 237 |
| *Direct capital cost* | *US$M* | *158* |
| *Indirect capital cost* | *US$M* | *30* |
| *Contingency (30%)* | *US$M* | *49* |
| NPV to capex cost ratio | - | 2.9x |
| **Financial Performance** | | |
| LOM revenue | US$M | 4,600 |
| LOM EBITDA | US$M | 2,923 |
| Annual average revenue | US$M/y | 184 |
| Annual average EBITDA | US$M/y | 117 |
| Payback from start of operations | years | 1.9 |

## Titan Project – A Major Potential Source of Titanium and Rare Earths for the U.S.

The delivery of the Titan Project Scoping Study highlights the large, high value nature of a critical mineral development in west Tennessee, U.S., and provides the potential to be a leading U.S. source of low carbon critical minerals for advanced U.S. industries such as space, aerospace, electric vehicles and 3D printing, as well as critical defense applications.

As an example of the potential scale of the Titan Project, the in-situ titanium metal content produced over the life of the Titan Project is approximately 1.1 million tons, enough to supply the titanium metal content for approximately ~60,500 Boeing 787 airplanes, or over 1,000 years of 787 production based upon Boeing's future targeted production of 5x 787 airplanes per month.

For rare earths, the combined in-situ neodymium, praseodymium, terbium and dysprosium rare earth oxide content over the life of the Titan Project is approximately 16 thousand tons, enough to supply the rare earth metal content for NdFeB used in permanent magnet motors in electric vehicles for approximately 24 million electric vehicles.


***Figure 1: Titanium metal produced over the life of the Titan Project has the potential to support the production of ~60,500 Boeing 787s and ~24 million electric vehicles.***

### *Titanium*

Combined with IperionX's breakthrough titanium metal technologies, the Titan Project the potential to re-shore the U.S. titanium supply chain in an efficient and sustainable manner, through eliminating process stages, reducing energy consumption, reducing carbon emissions and significantly cutting costs.

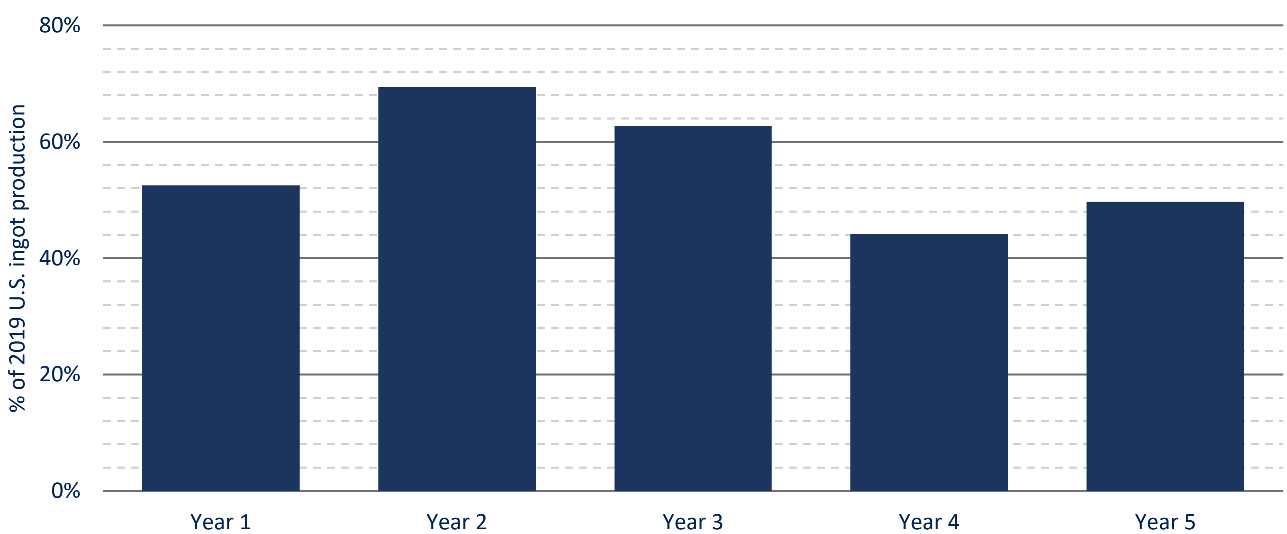


***Figure 2: First 5-year average contained titanium metal (in concentrate) vs. 2019 U.S. titanium ingot production[1].***

[1] Source: USGS, Roskill, WoodMackenzie

### *Rare Earth Elements*

The Titan Project has the potential to be one of the largest sources of monazite and xenotime minerals for the rare earth supply chain in the U.S. Importantly, the Titan Project endowment of Heavy Rare Earths including Dysprosium, Terbium and Yttrium could make IperionX one of the largest suppliers in the U.S.

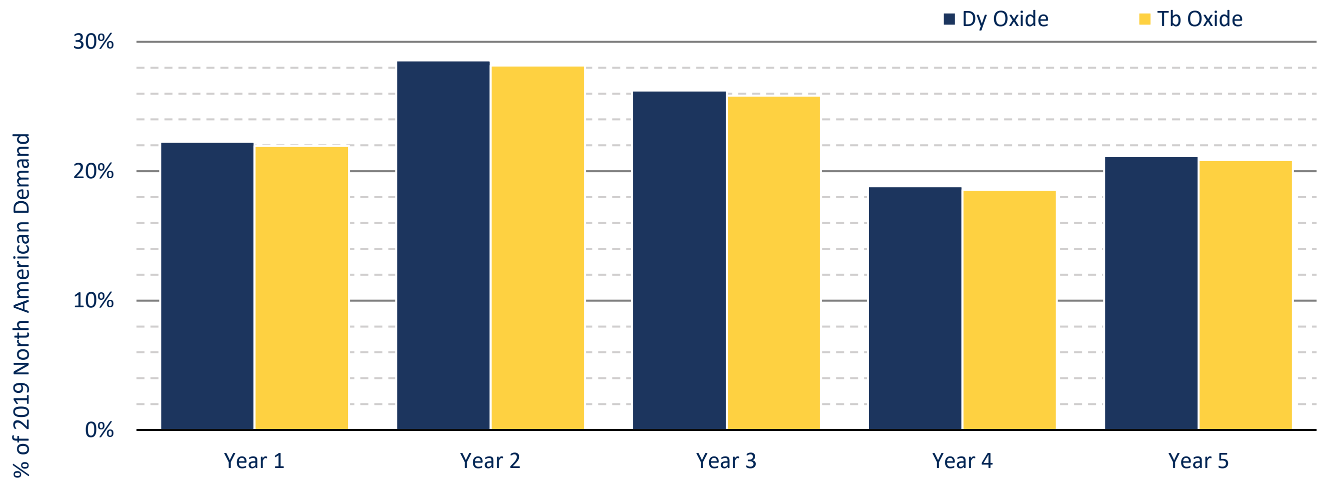


***Figure 3: First 5-year average contained dysprosium & terbium oxide production vs. 2019 demand[2].***

IperionX previously announced a partnership with Energy Fuels Inc. has the potential to establish a fully integrated, "mine to market" U.S. rare earth supply chain for the electric vehicle and renewable energy sectors. This partnership allows the potential for rapid and low capex entry to the U.S. rare earth supply chain by utilizing Energy Fuels' existing White Mesa mill in Utah, and highlights the importance of the Titan Project as a potentially important source of high value U.S. rare earth minerals, and in particular heavy rare earths.

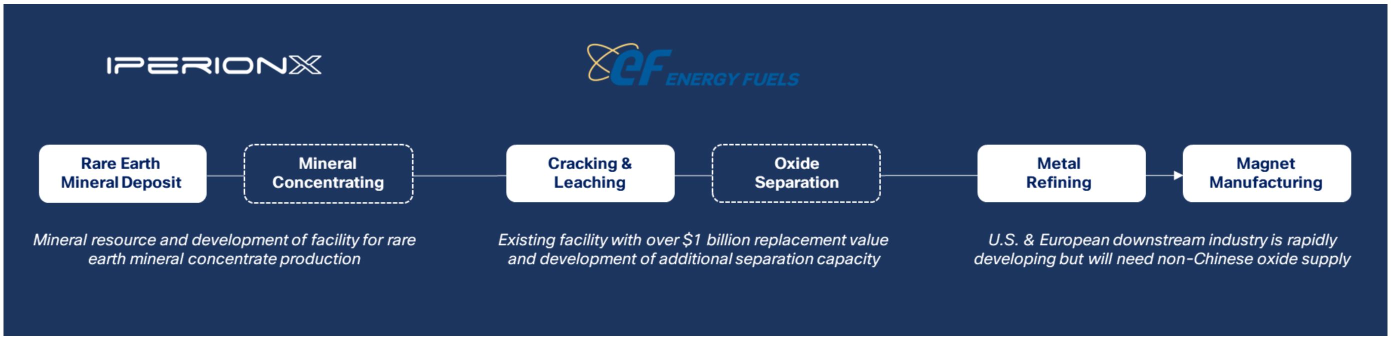


***Figure 4: U.S. rare earths partnership between IperionX and Energy Fuels.***

## Potential for Significant Cashflow Generation

IperionX's Scoping Study highlights the potential for the Company to develop a low-cost domestic source of critical minerals in the U.S., with compelling economics, including average life of mine annual EBITDA of US$117 million per annum, after-tax $NPV_8$ of US$692 million and an after-tax IRR of 40%, for an initial capital investment of US$237 million (inclusive of a 30% contingency).

### *EBITDA Projection*

A useful comparison to gauge the potential importance and value associated with critical mineral projects in the U.S. is the Mountain Pass project, operated by MP Materials Corp., which went public via a de-SPAC process in November 2020. MP Materials generates rare earth products from its operation in California, and at the time of the de-SPAC the

[2] Source: USGS, Roskill, Wood Mackenzie

transaction implied an enterprise value of approximately US$1,000 million. Subsequent to the transaction, MP Materials have outperformed their projections, with a current market capitalization of approximately US$6,350 million.

***Table 2: Titan Project EBITDA comparison.***

| EBITDA US$M | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Titan Project – Scoping Study | 122 | 173 | 116 |
| MP Materials – Forecast at De-SPAC[3] | 8 | 29 | 82 |

### *NPV to Capex Ratio*

The Titan Project's NPV to capex ratio, an economic benchmark which highlights the potential value generated by the initial development capital investment, is at the top end of the range of comparable north American critical mineral projects. This metric is often seen as a measure of the "fundability" of a mineral resource project, and highlights the attractiveness of the Titan Project when compared to its north American peers.

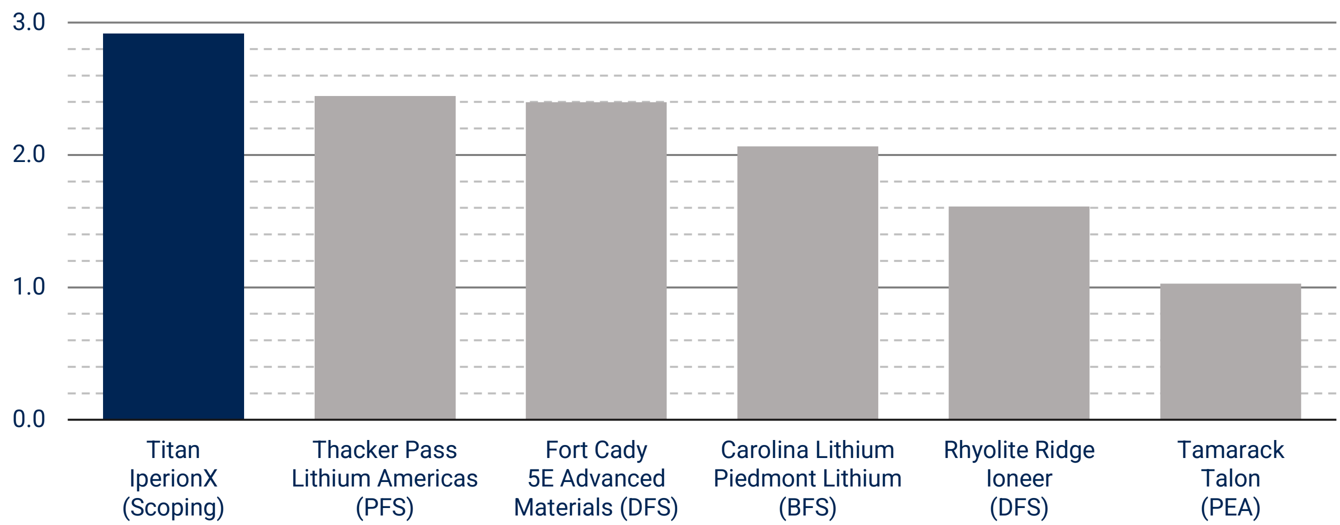


***Figure 5: Titan Project NPV to capex ratio compared to other north American critical mineral developments[4].***

### *Pricing Scenario Sensitivity*

Base case financial metrics for the Titan Project Scoping Study are based upon pricing forecasts from leading industry consultancies in rare earths and heavy mineral sand products. A scenario indicative of prolonged supply constraints modelled, including a 20% premium to product pricing, has been modelled for indicative purposes.

***Table 3: Key Scoping Study metrics – pricing sensitivity.***

| Financial Performance | Unit | Base Case | Prolonged supply constraints |
|---|---|---|---|
| Average annual revenue | US$M/y | 184 | 234 |
| Average first five-year EBITDA | US$M/y | 118 | 178 |
| Payback from start of operations | years | 1.9 | 1.3 |

[3] MP Materials company presentation, July 15, 2020

[4] Sources: Lithium Americas Thacker Pass Project PFS (link), 5E Advanced Materials Fort Cady Project DFS (link), Piedmont Lithium Carolina Lithium Project BFS (link), Ioneer Rhyolite Ridge Project DFS (link), Talon Metals Tamarack Nickel Project PEA (link)

## Globally Significant Mineral Resource in a Tier 1 Jurisdiction

IperionX holds a 100% interest in the Titan Project, covering over 11,000 acres of titanium, rare earth minerals and, zircon rich mineral sands properties in Tennessee, U.S. The Titan Project is strategically located proximal to the town of Camden in the southeast of the U.S., with low-cost road, rail and water logistics connecting it to world class manufacturing industries and customers.

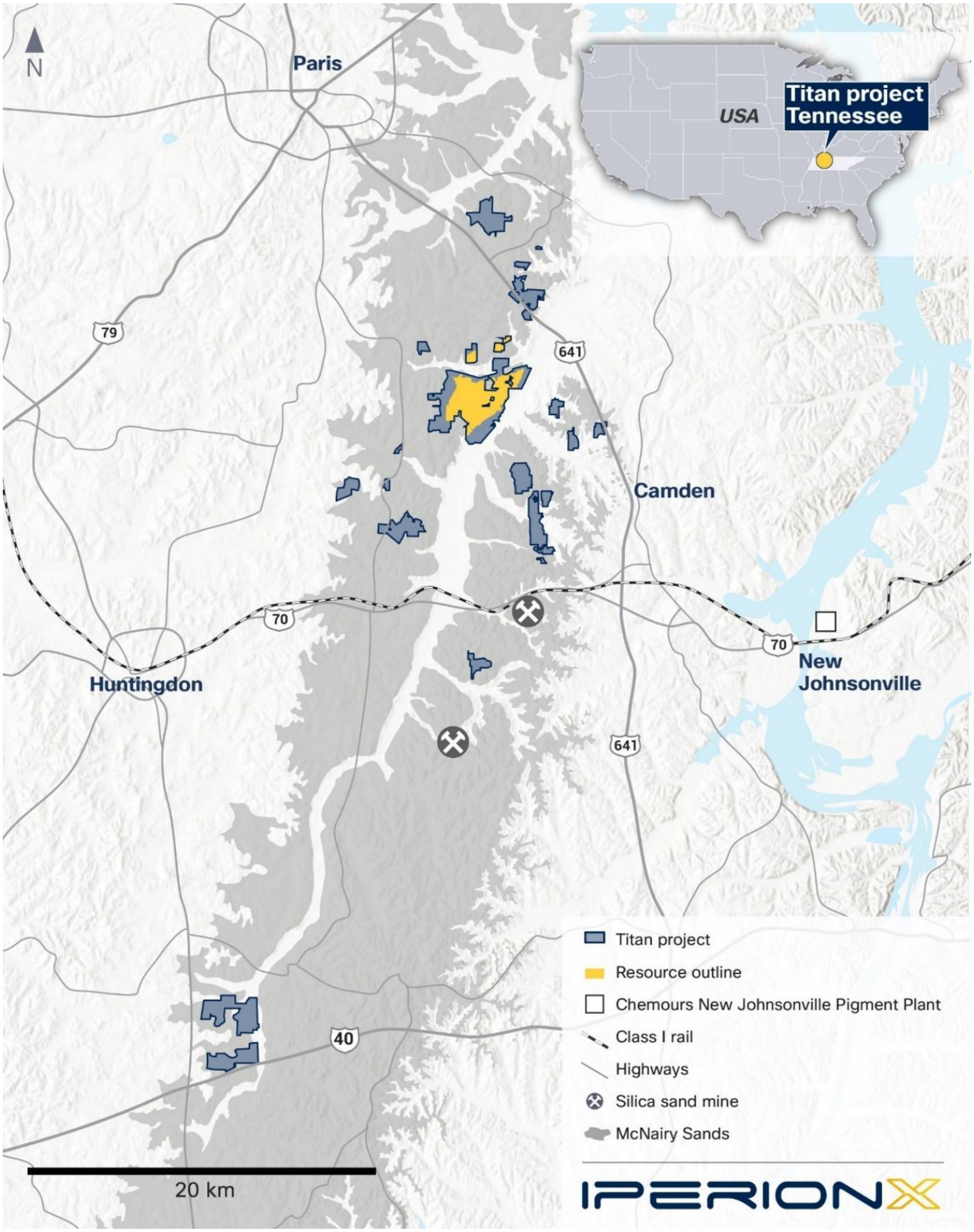


*Figure 6: IperionX's land position over the McNairy Sand formation.*

The Company's maiden Mineral Resource Estimate (MRE) delivered in Q4 2021 confirmed the Titan Project one of the largest and most important critical mineral deposits in the U.S., with a high in-situ value underpinned by a product assemblage of high value zircon, titanium minerals and heavy and light rare earth elements. The shallow, high grade and unconsolidated nature of the sandy mineralization enables the potential for simple mining operations such as dozer push followed by an industry standard mineral processing flowsheet.

The delivery of a large-scale MRE and Scoping Study at the Titan Project is a key step in developing a fully integrated domestic titanium metal and rare earth metal supply chain. This is of strategic importance for the U.S., as the country is one of the largest global consumers of finished products containing these metals, but is currently 100% import reliant. The current focus from both industry and the U.S. government is upon re-shoring these critical minerals and building resilient and long lasting supply chains, which can be achieved by the development of IperionX's operations.

The current production target for the Scoping Study covers only 4,173 acres or 38% of the total 11,071 acres of surface and associated mineral rights in Tennessee. The Company expects to increase the overall MRE tonnage in 2022 which will enable further options to be reviewed in terms of potential for scale or mine life extensions beyond the current Scoping Study parameters.

Further, IperionX continues to consolidate the surrounding land and it is expected that an increase in landholding will also create a platform for additional growth in the mineral resource.

## Infrastructure and Location Advantage to Major Target Markets and End Users

IperionX's Titan Project is strategically located near Camden, Tennessee, and is expected to benefit from significant cost advantages due to the location and proximity to low cost, world-class infrastructure and customer base.

95,000 miles of highway, including 8 interstate highways, put Tennessee within a day's drive of a majority of U.S. consumer markets. Tennessee is the third largest rail center in the U.S. and there are more than 1,000 miles of navigable waterways which access all other major waterways in the eastern U.S. There are over four commercial airports near Camden, including two international airports at Memphis and Nashville.

This world class infrastructure is expected to provide material cost and logistics advantages compared to projects located in more remote areas. The existing infrastructure includes low-cost power and gas, with high-capacity transmission lines near the Project, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports.

***Table 4: Comparison of major economic variables between Tennessee and Western Australia.***

| | Tennessee, U.S. | Western Australia |
|---|---|---|
| Power | US$0.06/kWh *(100% renewable)* | US$0.13/kWh |
| Operator - base salary | US$50,000 | US$125,000 |
| FIFO camp | ✗ | ✓ |
| Federal corporate tax | 21% | 30% |
| Depletion allowance | 22% for HMS and 14% for monazite | nil |

Further, a very cost-competitive, skilled local workforce removes any potential requirements for FIFO operations or the construction of a mining camp. The area has low-cost housing compared with the rest of the U.S., with median house prices of US$113,000 compared to over US$380,000 for the U.S. In addition, over 4 million people live just over 90 minutes away by car in the Nashville and Memphis metropolitan areas.

The Titan Project also benefits from a major logistical advantage over many other critical minerals that are imported into the U.S. This results in both a cost advantage (lower delivered cost for the consumer of the minerals) and a lower carbon intensive supply chain. This supply chain advantage is most prominent in the import of titanium feedstocks and is expected to result in a major cost advantage delivering into the U.S. pigment market, particularly given the highly volatile nature of global bulk shipping rates.

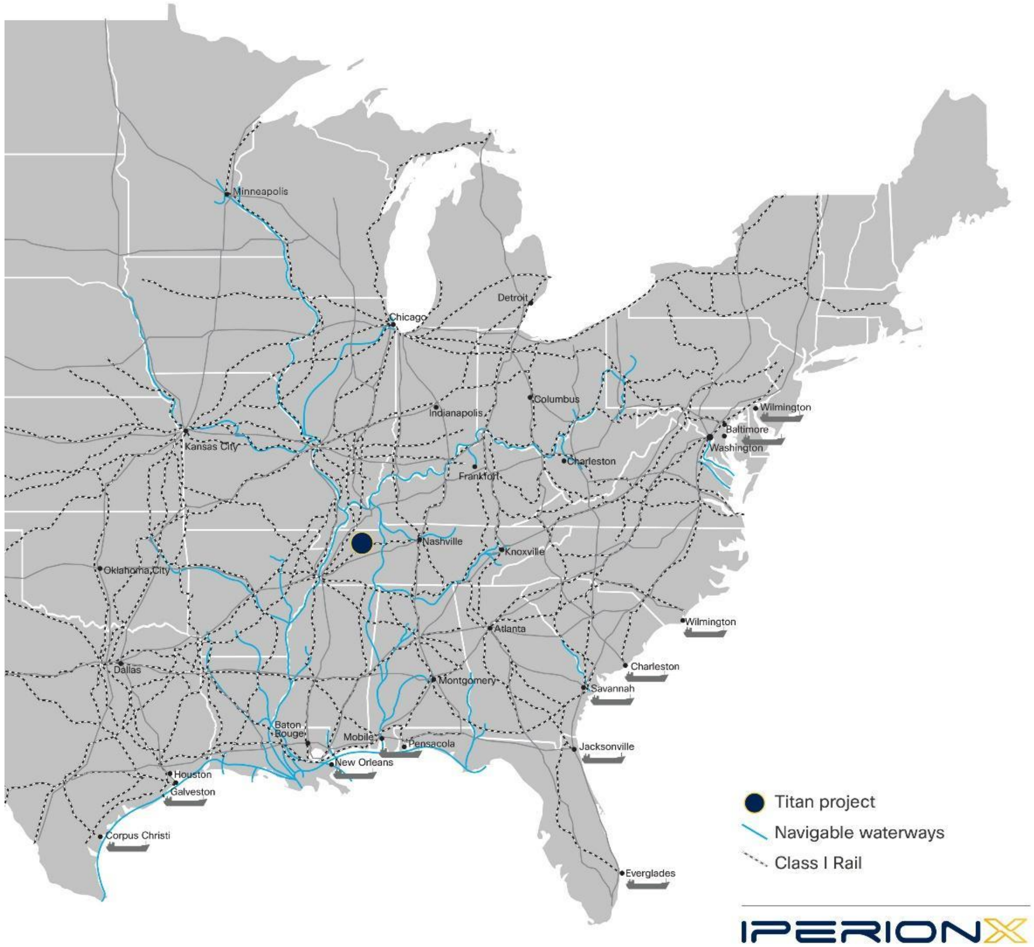


***Figure 7: Titan Project location and proximity to major transportation infrastructure.***

It is anticipated that the major potential cost advantage, and security of supply, that the proximity of the Titan Project brings to potential customers in North America will command a significant premium in pricing. This potential pricing premium has not been modelled as part of the economic assessment under the Scoping Study.

Further, carbon emissions associated with seaborne transportation indicate a saving of between 2,300 – 5,000 tons of $CO_2$ per one way journey from major titanium export ports, which converts to approximately 50 – 200 kg of $CO_2$ per ton of product. As a comparable benchmark, the average passenger vehicle in the U.S. emits around 4.5 tons of $CO_2$ per year.

***Table 5: $CO_2$ emissions and $CO_2$ intensity per product tonne from shipping[5].***

| Shipping Route | Distance (km) | $CO_2$ per trip (tons) | $CO_2$ / t product (kg, approx) |
|---|---|---|---|
| Western Australia – Mobile | 20,000 | 5,000 | 115 |
| South Africa – Mobile | 15,000 | 3,750 | 85 |
| Norway – Mobile | 9,000 | 2,300 | 50 |

[5] $CO_2$ assumptions based on Handymax ship size (45,000 t payload) with carbon emissions of 5.67 g/tonne-kilometer. Data: Gratsos, Psaraftis and Zachariadis, Life-Cycle $CO_2$ Emissions Of Bulk Carriers: A Comparative Study, Transactions of the Royal Institution of Naval Architects Part A: International Journal of Maritime Engineering, July 2010


*Figure 8: Project location and proximity to major pigment producers compared to imported titanium feedstocks.*

## "Sustainable First" Development of North American Critical Mineral Supply Chains

IperionX is focusing on becoming the leading developer of low-to-zero carbon, sustainable, critical materials in the U.S., and is actively taking a "sustainable first" approach to all areas of Titan Project development, aiming to be a global leader in sustainable critical mineral extraction.

The Company is working with Presidio Graduate School's expert consulting division, PGS Consults, to undertake Environmental, Sustainability and Corporate Governance studies to define best practice mining and processing operations in this leading critical mineral province, and is in the process of conduct activities including a materiality assessment, life cycle assessment, ESG-leadership playbook, and an environmental health and safety (EHS) management system gap assessment.

Further, the Company is working with the University of Tennessee's Institute of Agriculture (UTIA) to conduct research and field trials for sustainable development practices at the Titan Project, including a priority focus on land rehabilitation best practices that improve post-mining land use and agricultural yields, and provide for carbon sequestration and carbon credit creation opportunities. UTIA activities will be led by Dr. Forbes Walker, a world-renowned professor in soil science with deep experience in land rehabilitation, including the famed Copper Basin in southeastern Tennessee.

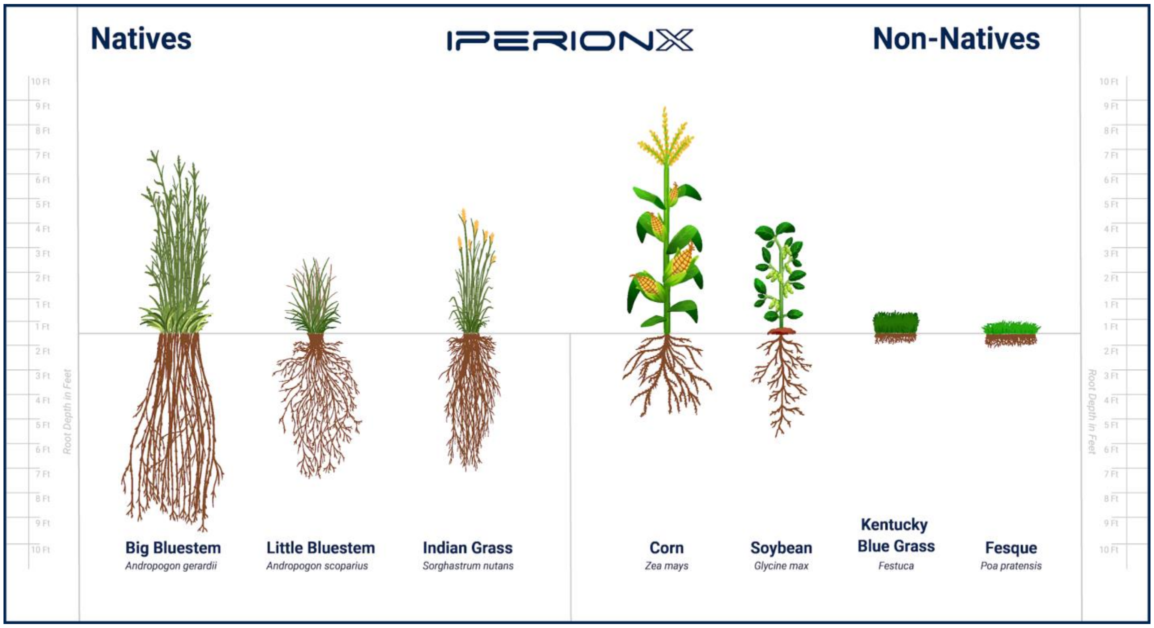


*Figure 9: Native grass root growth vs. non-native.*

IperionX intends to implement fully renewable power sourcing options for the Titan Project, including the assessment of existing on-grid solutions currently provided by incumbent power generators and suppliers in the area.

A particular focus of mining and engineering activities in the Scoping Study has been the development of a sequential mining method to allow for a low cost, reduced area footprint and environmentally sustainable mining process. These rehabilitation methods have been used successfully in the U.S. and IperionX aims to improve on these examples.

*Figure 10: Example of historic U.S. mineral sand operations which has been rehabilitated and revegetated.*

Work is underway to prepare the IperionX 2022 Annual Sustainability Report. This report will further summarize all the ESG achievements and ongoing work towards IperionX's ESG goals.

The support of the local community is fundamental to IperionX's license to operate, and the Company has conducted significant and regular community engagement activities since it was established.

IperionX is dedicated to building sustainable community relationships, and is working in a structured way to allow the Company to continue to build trust, broaden support, improve knowledge and promote community participation and engagement in the development of the Titan Project.

Groups and organizations with who IperionX regularly engages with include the Tennessee Department of Environment and Conservation, the Tennessee Valley Authority, the University of Tennessee, Tennessee state government officials, local residents and business owners, local government officials, local school systems and technical colleges.

## Progressing to Construction Ready by 2023

The Scoping Study demonstrates the Titan Project's importance as a leading U.S. critical mineral project and the Company has now been working on progressing the Project to be construction ready during 2023.

| | 2022 | | | 2023 | | | |
|---|---|---|---|---|---|---|---|
| | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Opportunities & permit review | | | | | | | |
| Pre-feasibility study | | | | | | | |
| Feasibility bulk sample & test work | | | | | | | |
| Feasibility study | | | | | | | |
| Permitting | | | | | | | |
| Shovel ready / FID | | | | | | | |

***Figure 11: Titan Project construction ready timeline.***

Importantly to achieve this timeline the company has focused on the metallurgical test work programs needed to be completed to underpin both pre-feasibility and feasibility studies. To-date pre-feasibility test work has been completed with result to be finalized and incorporated into the pre-feasibility study and the Company is now engaged in feasibility study test work.

To aid in the development of the feasibility study test work the Company constructed the first stage of a three-stage demonstration facility on the Titan Project that was used to prepare the feasibility study test work samples. The first stage included hydro-cyclones and materials handling to allow for the removal of fine (minus 45 micron) material from the samples. The resulting product could then be more readily shipped and process by Minerals Technologies pilot wet concentration plant in Florida.

The Company intends to build upon the demonstration plant with two more stages allowing for production of mineral products including rutile, ilmenite, rare earths minerals and zircon. Stage two will see the addition of a set of MG12 spirals that will allow for the production of heavy mineral concentrate. Stage three will be the construction of a demonstration scale flotation plant for the rare earth minerals monazite and xenotime together with electrostatic and electromagnetic equipment to separate the titanium and zircon minerals. The demonstration plant will then assist customer discussions and offtake, provide for titanium minerals for further downstream processing and provide an opportunity to educate and interact with the community on the sustainable processing afforded to the Titan Project.

*Figure 12: Titan Project Mineral Demonstration Facility.*

The Company has now also commenced a review of the opportunities available that could significantly enhance the economics. These reviews are expected to be completed ahead of the commencement of the pre-feasibility study.

*Table 6: Titan Project opportunities.*

| Titan Project Opportunities | | |
|---|---|---|
| **Opportunity** | | **Potential Effect** |
| Mineral Extraction | Evaluation of dozer push and other mineral extraction techniques | Lower operating costs |
| | Conversion of inferred to indicated & measured resources and optimization of mineral extraction plan | Lower operating costs |
| | Expansion of mineable mineral resources | Increased production / longer operation life |
| Processing | Evaluation of phased build-out of operations | Lower capital costs |
| | Integration of product upgrading technologies including IperionX developed synthetic rutile process | Increased sales pricing |

The Company is also undertaking a permit pathway review which will result in a permitting strategy that is expected to lead to the Company applying for permits on the Titan Project with the Tennessee regulators in late 2022.

**Anastasios (Taso) Arima, CEO and Managing Director said:** *"The delivery of the maiden Scoping Study at the Titan Project is a significant milestone for IperionX and we are delighted to put Tennessee on the map as a major source of critical minerals for the U.S.*

*The Scoping Study confirms the Titan Project as a globally significant development of titanium and rare earths minerals, including the heavy rare earths that are essential for electric motors and defense applications, located in a leading jurisdiction and in close proximity to major potential customers. Importantly, the Scoping Study does not yet consider the potential upside associated with integration of the minerals operation with the Company's breakthrough titanium metal technologies.*

*The Titan Project economics showcase the potential for IperionX to generate significant cashflows from mineral operations over a 25 year operational life, including low-costs, an average annual EBITDA of US$117 million, with an NPV of US$692 million and IRR of 40% highlight the outstanding value associated with the Project.*

*We are now rapidly progressing to be construction ready in 2023, with feasibility study level activities already underway and optimization of mine planning, processing and permitting pathways to commence shortly.*

*We are looking forward to working with the community in west Tennessee to develop a generational critical mineral asset for the U.S., as well as advancing engagement with our other stakeholders including offtake partners."*

This announcement has been authorized for release by the Board.

For further information and enquiries please contact:

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***Forward Looking Statements***

*Information included in this release constitutes forward-looking statements. Often, but not always, forward looking statements can generally be identified by the use of forward-looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", and "guidance", or other similar words and may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production or construction commencement dates and expected costs or production outputs.*

*Forward looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause the Company's actual results, performance, and achievements to differ materially from any future results, performance, or achievements. Relevant factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development, including the risks of obtaining necessary licenses and permits and diminishing quantities or grades of reserves, political and social risks, changes to the regulatory framework within which the company operates or may in the future operate, environmental conditions including extreme weather conditions, recruitment and retention of personnel, industrial relations issues and litigation, as well as other uncertainties and risks set out in filings made by the Company from time to time with the Australian Securities Exchange and the U.S. Securities and Exchange Commission ("SEC").*

*Forward looking statements are based on the Company and its management's assumptions relating to the financial, market, regulatory and other relevant environments that will exist and affect the Company's business and operations in the future. The Company does not give any assurance that the assumptions on which forward looking statements are based will prove to be correct, or that the Company's business or operations will not be affected in any material manner by these or other factors not foreseen or foreseeable by the Company or management or beyond the Company's control.*

*There may be other factors that could cause actual results, performance, achievements, or events not to be as anticipated, estimated or intended, and many events are beyond the reasonable control of the Company. Accordingly, readers are cautioned not to place undue reliance on forward looking statements. Forward looking statements in these materials speak only at the date of issue. Except as required by applicable law or stock exchange listing rules, the Company does not undertake any obligation to publicly update or revise any of the forward-looking statements or to advise of any change in events, conditions or circumstances on which any such statement is based.*

***Competent Persons Statements***

*The information in this announcement that relates to Exploration Results and Mineral Resources is based on, and fairly represents, information compiled and/or reviewed by Mr. Adam Karst, P.G., a Competent Person who is a Registered Member of the Society of Mining, Metallurgy and Exploration (SME) which is a Recognized Overseas Professional Organization (ROPO) as well as a Professional Geologist in the state of Tennessee. Mr. Karst is a consultant to IperionX Limited. Mr. Karst has sufficient experience which is relevant to the style and type of mineralization present at the Titan Project area and to the activity that he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (the 2012 JORC Code). Mr. Karst consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.*

*The information in this announcement that relates to Process Design is based on, and fairly represents, information compiled and/or reviewed by Mr. Eugene Dardengo, a Competent Person who is a Member of the Australian Institute of Mining and Metallurgy. Mr. Dardengo is a consultant to Primero Group Limited, which wholly owns Primero Group Americas Inc. Mr. Dardengo has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Mineral Resources and Ore Reserves'. Mr. Dardengo consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*

*The information in this announcement that relates to Mine Design is based on, and fairly represents, information compiled and/or reviewed by Mr. Stephen Miller, a Competent Person who is a Fellow of the Australian Institute of Mining and Metallurgy. Mr. Miller is a consultant to Primero Group Limited, which wholly owns Primero Group Americas Inc. Mr. Miller has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Mineral Resources and Ore Reserves'. Mr. Miller consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*

*The information in this announcement that relates to Cost Estimates and Financial Analysis is based on, and fairly represents, information compiled or reviewed by Mr. Stephane Normandin, a Competent Person who is a Registered Member of Ordres des Ingenieurs du Quebec, a Recognized Overseas Professional Organization (ROPO). Mr. Normandin was a full time employee of Primero Group Americas Inc. Mr. Normandin has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Mineral Resources and Ore Reserves'. Mr. Normandin consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*




# Titan Project

TECHNICAL REPORT SUMMARY FOR TITAN PROJECT

# TECHNICAL REPORT SUMMARY FOR TITAN PROJECT

## Contents

# DISCLAIMER

The following report was prepared for IperionX by Primero Group Americas Inc. (Primero) as an independent consultant and is part based on information provided by IperionX and part on information not within the control of either IperionX or Primero. While it is believed that the information, conclusions, and recommendations will be reliable under the conditions and subject to the limitations set forth herein, Primero does not guarantee their accuracy. The use of this report and the information contained herein shall be at the user's sole risk, regardless of any fault or negligence of Primero.

# USE OF THIS INFORMATION

This document summarizes the scope of works Primero was engaged to undertake as an independent consultant, appointed by IperionX to investigate the requirements associated with establishing the mineral processing of the Titan Project, along with associated infrastructure in accordance with Primero's proposals Doc No. 40501-PPL-GE-001_4.

Primero gives its permission to IperionX to use the information if it reflects the findings and understanding that are presented in this report. Use of this document, for whatever purpose, by any third party must seek written prior approval by Primero.

Primero has relied on other experts for the study portions on mineral resource estimate (Karst Geo Solutions) and metallurgical testing (Mineral Technology). Primero engaged sub-consultants, Palaris for the mining discipline and Keypoint for the metallurgical test work review and mineral processing method.

# 1. Executive Summary

IperionX engaged Primero Group Americas Inc. (Primero) to develop a Scoping Study for the Titan Project near Camden, TN. The Project includes a sand mineral deposit with a nearby Wet Concentrator Plant (WCP) located approximately at 17 miles northwest from the city of Camden. The Project also includes a dry Mineral Separation Plant (MSP) located approximately 1.2 miles southwest of the city of Camden. The distance separating the two plants is approximately 19 miles and accessed via public roads and highways. IperionX holds a 100% interest in the Titan Project.

The products of the Titan Project include ilmenite, rutile, premium zircon, zircon concentrate and rare earth concentrate (mainly monazite).

Key production values are presented in Table 7. Note: All references to mass within this report are metric.

***Table 7: Titan Project production average values.***

| Production Target | Average Value | Units |
|---|---|---|
| ROM | 9.7 | Mt/y |
| Ilmenite | 95,500 | t/y |
| Rutile | 16,700 | t/y |
| Monazite | 4,600 | t/y |
| Zircon - Premium | 22,400 | t/y |
| Zircon - Concentrate | 16,000 | t/y |

## 1.1 Exploration and Mineral Resource Estimate

IperionX engaged Karst Geo Solutions to prepare a Mineral Resource Estimate (MRE) for Total Heavy Minerals (THM), in accordance with the JORC Table 1 requirement. The content in this chapter is extracted from an ASX release dated 6 October 2021 entitled "Maiden Resource Confirms Tennessee as Major Untapped Critical Mineral Province by IperionX".

The Mineral Resource is based on 107 drill holes totaling 4,101 m and occupies an area roughly 6.2 km (north) by 3.6 km (east); the Mineral Resource is further broken up into several areas based on land holdings (land agreements). These range from 0.5 km (north) by 0.9 km (east) for the smallest area to 5.1 km (north) by 3.6 km (east) for the largest area.

The maiden MRE for the Titan Project comprises 431 Mt @ 2.2% THM, containing 9.5 Mt THM at a 0.4% cut-off and includes a high-grade core of 195 Mt @ 3.7% THM, containing 7.1Mt THM at a 2.0% cut-off. Slimes (SL) and oversize (OS) material accounts for approximately 20% and 2.5% of the in-ground material respectively SL and OS values for the Scoping Study were derived from the metallurgical bulk sample testwork as it has been identified that the dry-screening method utilized for the drill samples tends to under-report SL and over-report OS. It should be noted that these discrepancies do not materially impact THM and a revised method (wet screening) for drill samples has been developed and tested for the Project moving forward in the next phase that will produce more accurate SL and OS values.

There is a high level of confidence associated with the MRE classification, with 56% (241 Mt) classified as being in the Indicated resource category. Mineralization occurs as a single, large, and coherent near-surface deposit.

*Table 8: Mineral Resource Estimate and THM assemblage at 0.4% cut-off grade.*

| THM Assemblage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Cut off** | **Tons** | **THM %** | **THM** | **Zircon** | **Rutile** | **Ilmenite** | **REE** | **Staurolite** |
| | *(THM %)* | *(Mt)* | *(%)* | *(Mt)* | *(%)* | *(%)* | *(%)* | *(%)* | *(%)* |
| Indicated | 0.4 | 241 | 2.2 | 5.3 | 11.3 | 9.3 | 39.7 | 2.1 | 15.6 |
| Inferred | 0.4 | 190 | 2.2 | 4.2 | 11.7 | 9.7 | 41.2 | 2.2 | 13.7 |
| **Total** | **0.4** | **431** | **2.2** | **9.5** | **11.5** | **9.5** | **40.3** | **2.1** | **14.8** |

## 1.2 Mining Methods

IperionX tasked Primero and its sub-consultant Palaris for the mine design, integrating the IperionX provided Project mineral resource block model. Reconciliation of the reported MRE of the resource block model against the MRE report was achieved and confirmed. IperionX, requested that a high-level trade off study of the mining method be undertaken. The recommendation of using mobile mining units (MMU's) for the mineral sand and conventional loading and trucking units for the topsoil, overburden and interburden excavation, transportation and deposition was recommended and accepted. The MMU's will be owned by the Project owner whereas the conventional loading and trucking activities be made by a mining contractor.

The basic mining cycle is depicted in Figure 13, which shows the mine cycle from clearing to final condition post mining. The sequential mining method allows for low cost, reduced area footprint and environmentally logical mining process by limiting the change in final material location with the mineralized material and waste basically being returned to a similar position in the ground strata. This proposed method of mining, and mining cycle, is well proven in the heavy mineral sands industry, incorporating progressive backfill and rehabilitation to the pre-mining state.

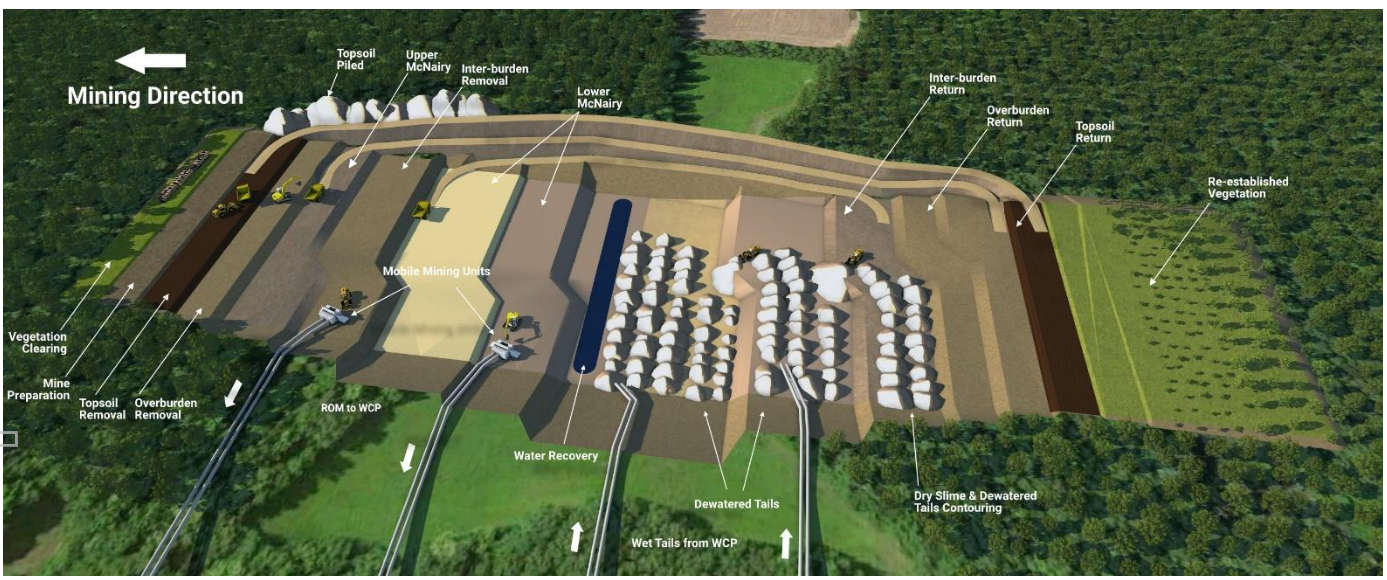


*Figure 13: Titan Project mining cycle.*

Pit optimizations were completed in order to produce a production schedule on an annual basis. This resulted in a total Production Targets of 243 Mt @ 3.0% THM In-Situ with a mine life of 25 years. The mining schedule delivers an outcome with the first 14 years mining 100% of indicated mineralized resource only, and the remaining years mining the inferred mineralized resource, resulting in a total mine life of 25 years. The schedule is based on 57% of the total mine ROM material being in an Indicated category.

*Table 9: Mine production schedule with % Indicated category processed by time period.*

| Year | ROM Tons | Inferred Tons | Indicated Tons | % Indicated Tons |
|---|---|---|---|---|
| | *(Mt)* | *(Mt)* | *(Mt)* | *(%)* |
| 1-14 | 136.5 | 0 | 136.5 | 100% |
| 15-25 | 106.1 | 105.3 | 0.8 | 1% |
| **LOM** | **242.6** | **105.3** | **137.3** | **57%** |

## 1.3 Mineral Processing and Metallurgical Testing

Four bulk samples were processed by Mineral Technologies through pilot equipment designed to emulate a full-scale Feed Preparation Plant (FPP), Wet Concentrator Plant (WCP), Monazite Flotation/Concentrate Upgrade Plant and a Mineral Separation Plant (MSP). Mineral Technologies is a reputable test laboratory with significant experience in mineral sands flowsheet development.

Assays were conducted by SGS in Lakefield, Canada and Bureau Veritas in Perth, Australia, with XRF, laser ablation / ICPMS and QEMSCAN analytical methods.

The final products and the grades of those final products that were produced form the testwork demonstrated that the Upper and Lower mineralized resource could be separated using processing stages common to most mineral sands' operations. Notably, the flotation test work achieved an overall 97% recovery of rare earth minerals in the final rare earth concentrate.

Based on the testwork results, it was concluded that a viable commercial operation could be established with appropriate processing options for a 10 Mtpa operation commencing in Benton area.

## 1.4 Processing and Recovery Methods

IperionX tasked Primero and its sub-consultant Keypoint for the metallurgical test work review and mineral processing method.

An overview of the major processing stages can be description as follows, please refer to Figure 27 & Figure 28 for simplified flow diagrams.

1. Run of Mine mineralized resource is processed in the Mobile Mining Unit (MMU) which removes trash & oversize. The undersize is pumped to the Feed Preparation Plant (FPP) and Wet Concentrator Plant (WCP)

2. In the FPP, the feed is de-slimed to separate clay and the sand. The slimes are directed to the thickener where they are thickened and then filtered. The sand fed into a constant density tank which is pumped to the rougher spiral stage at 1,000 tph at the start of the WCP

3. The WCP comprises of multiple stages of spiral separators which produce a tailings and a Heavy Mineral Concentrate (HMC) stream. The WCP tailings stream is dewatered and pumped to the mining void while the HMC (at a target grade of >85% THM) is dewatered and trucked to the Monazite Separation Plant.

4. The Monazite Separation Plant which consists of a flotation circuit and wet gravity circuits, to produce a monazite product and an upgraded HMC which consists predominantly of the titanium minerals & zircon minerals. The upgraded HMC is the feedstock for Mineral Separation Plant (MSP).

5. The MSP consists of a dryer, multiple stages of electrostatic separators, magnetic separators and wet gravity separators to produce ilmenite, rutile, premium zircon and zircon concentrate.

## 1.5 Capital Cost Estimate

Capital Estimates for the mine and process plant have been prepared by Primero Group using a combination of cost estimates from suppliers, historical data, reference to recent comparable projects. Costs are presented in US$ for Q2 2022 and are exclusive of escalation. The intended accuracy of the initial capital cost estimate for the Project is ± 35%. Table 10 highlights the total estimated capital expenditures for the Project.

*Table 10: Titan Project capital cost estimate summary.*

| Capital Cost Estimate Breakdown | US$ Million |
|---|---|
| Mine and Wet Concentration Plant | 94.6 |
| Mineral Separation Plant | 22.3 |
| Common Services | 12.5 |
| Project Indirects | 35.2 |
| Mobile Mining Units Turnkey | 23.3 |
| Contingency (30%) | 49.4 |
| **Total Initial Capital** | **237.2** |
| Deferred and sustaining capital | 198.5 |

## 1.6 Operating Cost Estimate

The processing plant operating cost estimate is based on a ±35% level of accuracy, utilizing indicative quotations where possible, and otherwise Primero database estimates and recent experience in the industry.

The OPEX is presented in USD and is current for Q1 2022. Table 11 summarizes the estimated operating costs at steady state.

*Table 11: Titan Project operating cost estimate summary.*

| Operating Cost Estimate Breakdown | Average Annual Cost (US$ Million/y) | US$/t ROM |
|---|---|---|
| Mining | 25.8 | 2.66 |
| Processing | 28.2 | 2.91 |
| Transport | 2.1 | 0.22 |
| General & Admin | 6.9 | 0.71 |
| Royalties | 4.0 | 0.41 |
| **Total Operating Costs** | **67.1** | **6.91** |

## 1.7 Economic Analysis

A detailed financial model and discounted yearly cash flow (DCF) has been developed to complete the economic assessment of the Project and is based on current (Q1 2022) price projections and cost estimates in U.S. dollars. No provision was made for the effects of future inflation, but cost estimates incorporate recent 2021 inflationary price increases. The evaluation was carried out on a 100%-equity basis using an 8% discount factor. Current US federal and Tennessee state tax regulations were applied to assess the corporate tax liabilities.

*Table 12: Titan Project economic measures summary*

| Economic Measures Summary (After Tax) | Value |
|---|---|
| Annual EBITDA (first five years) | $118M |
| Project NPV (discounted at 8.0%) | $692M |
| Internal rate of return (IRR) | 40% |
| Payback period (from start of operations) | 1.9 y |

## 1.8 Interpretation and Conclusions

The QPs are confident in the technical and economic assessment presented in this TRS.

The QPs also recognize that the results of this TRS are subject to many risks including, but not limited to: commodity prices, unanticipated inflation of capital or operating costs, geological uncertainty and geotechnical and hydrologic assumptions.

The Scoping Study update highlights several advantages which include:

- Low complexity mining practices can be employed utilizing local service providers.
- Mining footprint can be controlled to limit environmental and social impacts.
- Mining approach presented returns land mass to pre-mining conditions as minimum.
- Signed Memorandum of Understanding (MOU) for rare earth concentrate and titanium minerals (rutile and ilmenite) and zircon products.
- Shipping advantage, given that a large proportion of the rare earth concentrate and titanium (rutile and ilmenite) products are anticipated to be sold within the U.S.
- Exposure to high-demand, future-facing commodities experiencing increasing commodity prices.
- The net present value of the 25-year based project is $692M at an 8% discount rate and after tax.
- The internal rate of return (IRR) is 40%.

At the time of publication of this Scoping Study report a preliminary feasibility study is planned to be completed.

## 1.9 Recommendations

The Scoping Study/Initial Assessment demonstrates the Titan Project's importance as a leading U.S. critical mineral project, and puts IperionX in a strong position to rapidly advance next steps in the development process, including:

- Continued exploration and expansion of the Company's land position;
- Advancing project permitting and development approvals;
- Commencement of a pre-feasibility study to optimize mine and process design;
- Performing feasibility study level flowsheet development test work (ongoing);
- Develop a Mineral Demonstration Facility on site (completed desliming, planning wet concentration and mineral separation stages.)
- Investigation of product upgrading and downstream processing;
- Undertaking a lifecycle analysis for the Company's mineral and metal projects and operations;
- Continue implementation of sustainable operating and rehabilitation practices with UTIA;
- Continued stakeholder awareness and engagement; and
- Formalizing agreements with a number of prospective strategic, technical and offtake partners.

# 2. Introduction

IperionX's mission is to be the leading developer of low-to-zero carbon, sustainable, critical material supply chains for advanced American industries including space, aerospace, electric vehicles and 3D printing.

The Company holds a 100% interest in the Titan Project, comprised of approximately 11,071 acres of surface and associated mineral rights in Tennessee prospective for heavy mineral sands (HMS), rich in minerals critical to the U.S., including titanium, rare earth minerals, high grade silica sand and zircon in Tennessee, U.S. The Titan Project is strategically located proximal to the town of Camden in the southeast of the U.S., with low-cost road, rail and water logistics connecting it to world class manufacturing industries and customers.

The Scoping Study has confirmed that the Titan Project is one of the largest and most important critical mineral deposits in the U.S., with a high in-situ value underpinned by a product assemblage of high value zircon, titanium minerals and heavy and light rare earth elements.

This Scoping Study combines information and assumptions provided by a range of independent and reputable consultants, including the following consultants who have contributed to key components of the Study.

***Table 13: Scoping Study consultants & inputs.***

| Scope of Work | Consultant / Basis of Estimate |
|---|---|
| Mine design, process design, capex & opex, financial analysis | Primero and its sub-consultants |
| Mineral Resource Estimate | Karst Geo Solutions |
| Metallurgical testwork and analysis | Mineral Technologies & SGS |
| Pricing – Titanium feedstock and zircon products | TZMI |
| Pricing – Rare earth concentrates | Adamas Intelligence |
| Permitting | HDR |
| Rehabilitation program | University of Tennessee |
| ESG assessment and integration | PGS Consults |

## 2.1 Registrant and Terms of Reference

This report was prepared for the sole use of IperionX and its affiliated and subsidiary companies and advisors. The report is intended to provide sufficient information in a single document to support the disclosure of a statement of heavy mineral sand Mineral Resources by the Company, as defined under the United States Securities and Exchange Commission (SEC) Regulation S-K 1300 Modernization of Property Disclosures, as well as under the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code).

All units of measurement used in this report are International System of Units (SI) metric unless otherwise stated. Heavy mineral sand resources are reported in metric tons.

## 2.2 Information Sources

This document summarizes the scope of works Primero was engaged to undertake as an independent consultant, appointed by IperionX to investigate the requirements associated with establishing the mineral processing of the Titan Heavy Mineral Sands Project, along with associated infrastructure in accordance with Primero's proposals Doc No. 40501-PPL-GE-001_4.

Primero has relied on other experts for the study portions on mineral resource estimate (Karst Geo Solutions) and metallurgical testing (Mineral Technology). Primero engaged sub-consultants, Palaris for the mining discipline and Keypoint for the metallurgical test work review and mineral processing method.

## 2.3 Personal Inspections

Adam Karst P.G., CP & QP for mineral resource estimate, has made several inspections of the site from October 2020 to May 2022 to review the drilling methods, sample collection, bulk sample collection, bulk processing and QAQC procedures.

## 2.4 Previously Filed Technical Report Summary

No previous Technical Report Summaries have been filed.

## 2.5 Abbreviations, Acronyms and Units of Measure

*Table 14: Abbreviations, acronyms and units of measure.*

| Symbol | Description |
|---|---|
| B | Billion |
| CAPEX | Capital Expenditure |
| COG | Cut Off Grade |
| EBITDA | Earnings Before Interest, Taxes, Depreciation and Amortization |
| EBT | Earnings Before Taxes |
| FEED | Front End Engineering Detail |
| HMC | Heavy Mineral Concentrate |
| HMS | Heavy Mineral Sand |
| HTR | Electrostatic High Tension Roll Separator |
| IRR | Internal Rate of Return |
| M | Million |
| MMU | Mobile Mining Unit |
| MSP | Mineral Separation Plant |
| MRE | Mineral Resource Estimate |
| Mtpy | Million tons (metric) per year |
| NPAT | Net Profit After Tax |
| NPI | Non-Process Infrastructure |
| NPV | Net Present Value |
| OPEX | Operational Expenditure |
| PFDs | Process Flow Diagrams |
| PFS | Pre-feasibility Study |
| Primero | Primero Group |
| RED | Rare Earth Drum |
| REE | Rare Earth Element |
| RER | Rare Earth Rolls |
| RHF | Rougher Head Feed |
| ROM | Run of Mine |
| SL | Slimes |
| SS | Scoping Study |
| SMP | Structural Mechanical and Piping |
| $ | United States Dollars |
| WCP | Wet Concentrator Plant |

# 3. Property Description

## 3.1 Location

IperionX's Titan Project is located near Camden, Tennessee, U.S., approximately 80 miles west of Nashville, Tennessee and approximately 7 miles northwest of Camden, Tennessee.

The Property is centered at approximately 36.14734997015158N, -88.20974639890532W. The Project is location on the Mansfield, Manleyville, Vale and Bruceton United States Geological Survey Quadrangles. The coordinate system and datum used for modeling is UTMZ16N, NAD83.

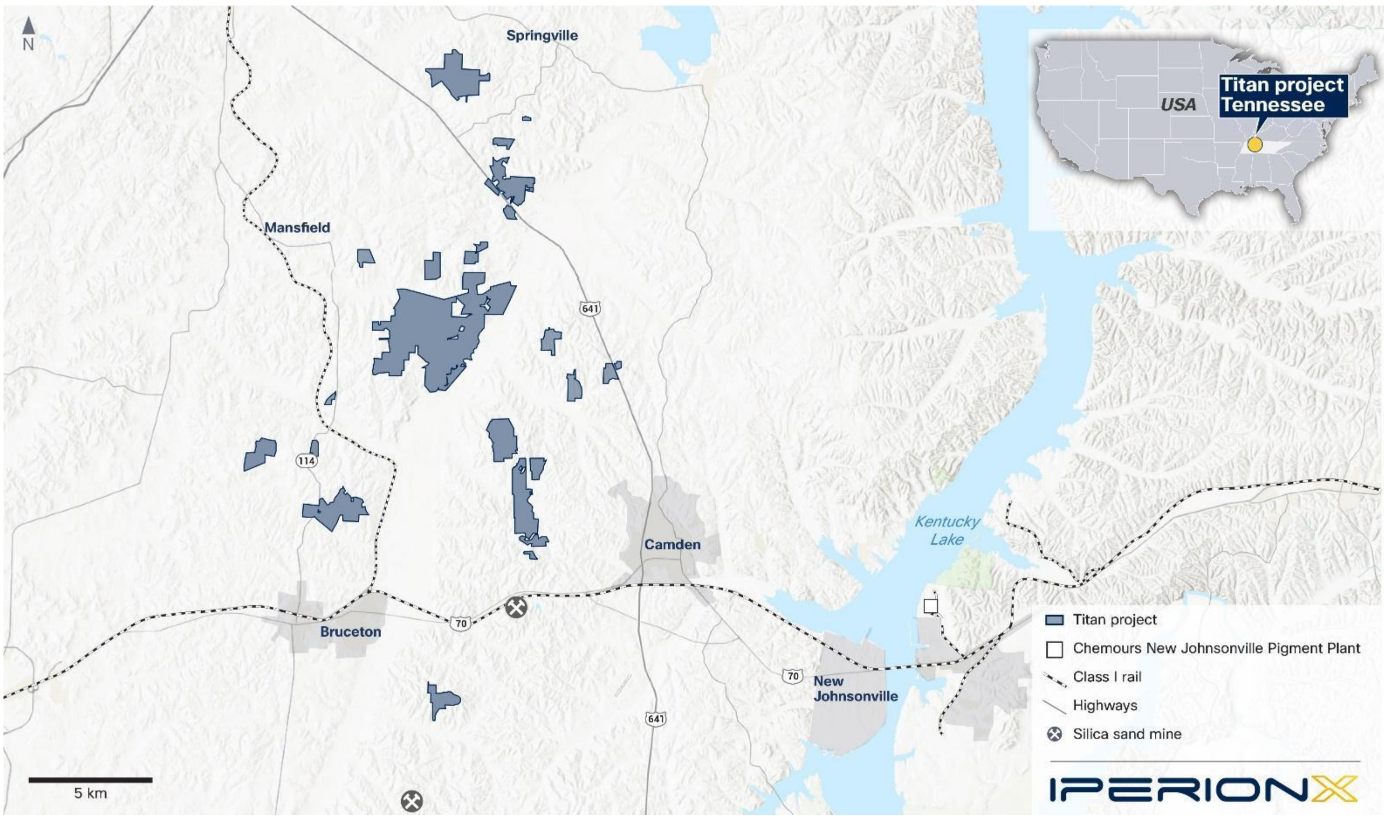


*Figure 14: Titan Project location.*

## 3.2 Titles, Claims or Leases

As of March 31, 2022, the Titan Project comprised of approximately 11,071 acres of surface and associated mineral rights in Tennessee within 82 separate property tracts, of which approximately 137 acres are owned outright, approximately 1,355 acres are subject to exclusive option to purchase agreements, and approximately 9,579 acres are subject to exclusive option to lease agreements.

Our option to lease agreements, upon exercise, allow us to lease the surface property and associated mineral rights from the local landowners, and generally have expiry dates between mid-2026 to late 2027. During the option period, our option to lease agreements provide for annual option payments and bonus payments during periods when we conduct drilling. Our annual option payments generally range between $25.00 to $75.00 per acre and our drilling bonuses generally average approximately $1.00 per drill foot. Our obligation to make annual option payments and drilling bonus payments cease if we exercise our option to lease. Upon exercise, in the case of an option to lease, we will pay an annual minimum royalty, generally $75 per acre, and a mining royalty, generally 5% of net revenues from products sold.

Our option to purchase agreements, upon exercise, allow us to purchase outright the surface property and associated mineral rights from the local landowners, and generally have expiry dates between mid-2022 to late-2023. During the option period, our option to purchase agreements provide for annual option payments and bonus payments during periods when we conduct drilling. Our annual option payments generally range between $25.00 to $50.00 per acre and our drilling bonuses generally average approximately $1.00 per drill foot. Our obligation to make annual option payments and drilling bonus payments cease if we exercise our option to purchase. Upon exercise, in the case of a purchase, we will pay cash consideration approximating the fair market value of the property, excluding the value of any minerals, plus a premium.

## 3.3 Mineral Rights

IperionX provided maps to KGS of properties where IperionX controls the mineral right through Option to Purchase agreements, Option to Lease agreements or owning the land. KGS has no knowledge of the mineral rights and or related to these properties nor does KGS possess knowledge of any previous or current boundary disputes or other concerns that would affect any future mining or processing operations.

## 3.4 Encumbrances

No Title Encumbrances are known.

## 3.5 Other Risks

All property deeds and titles are reviewed by IperionX's legal team, no properties showed risks.

# 4. Accessibility, Climate, Local Resources, Infrastructure and Physiography

## 4.1 Topography, Elevation and Vegetation

The Project area is located in the eastern portion of the United States and contains gently rolling topography with drainages (wetlands) dissecting the Project area. Surface elevations at the Project range from approximately 175m above sea level in the upland regions and approximately 100m at the stream level.

## 4.2 Access and Transport

General access to the Project is via a well-developed network of primary and secondary roads. Interstate I-40 lies 22 miles to the south of the Project and provides access to Nashville International Airport approximately 85 miles to the east.

## 4.3 Climate and Length of Operating Season

The Climate is temperate with warm summers and cold winters including the potential for snow/ice; this area will support year-round mining operations. Annual rainfall for the area is 53.8 inches. Land tracts within the Project area are primarily used for agriculture with some timbered tracts.

## 4.4 Infrastructure

The Project area is located near the towns of Camden and Paris, Tennessee with proximity to abundant infrastructure and labor. The existing infrastructure includes power and gas, with high-capacity transmission lines near the Project area, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports. There are two international airports at Memphis and Nashville. Potential water sources include nearby surface water bodies but will likely involve shallow groundwater.

## 4.5 Location

IperionX's Titan Project is strategically located near Camden, Tennessee, and will benefit from significant cost advantages due to the location and proximity to low cost, world-class infrastructure.

95,000 miles of highway, including 8 interstate highways, put Tennessee within a day's drive of a majority of U.S. consumer markets. Tennessee is the third largest rail center in the U.S. and there are more than 1,000 miles of navigable waterways which access all other major waterways in the eastern U.S. There are over four commercial airports near Camden, including two international airports at Memphis and Nashville.

This world class infrastructure is expected to provide material cost and logistics advantages compared to projects located in more remote areas. The existing infrastructure includes low-cost power and gas, with high-capacity transmission lines near the Project, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports.

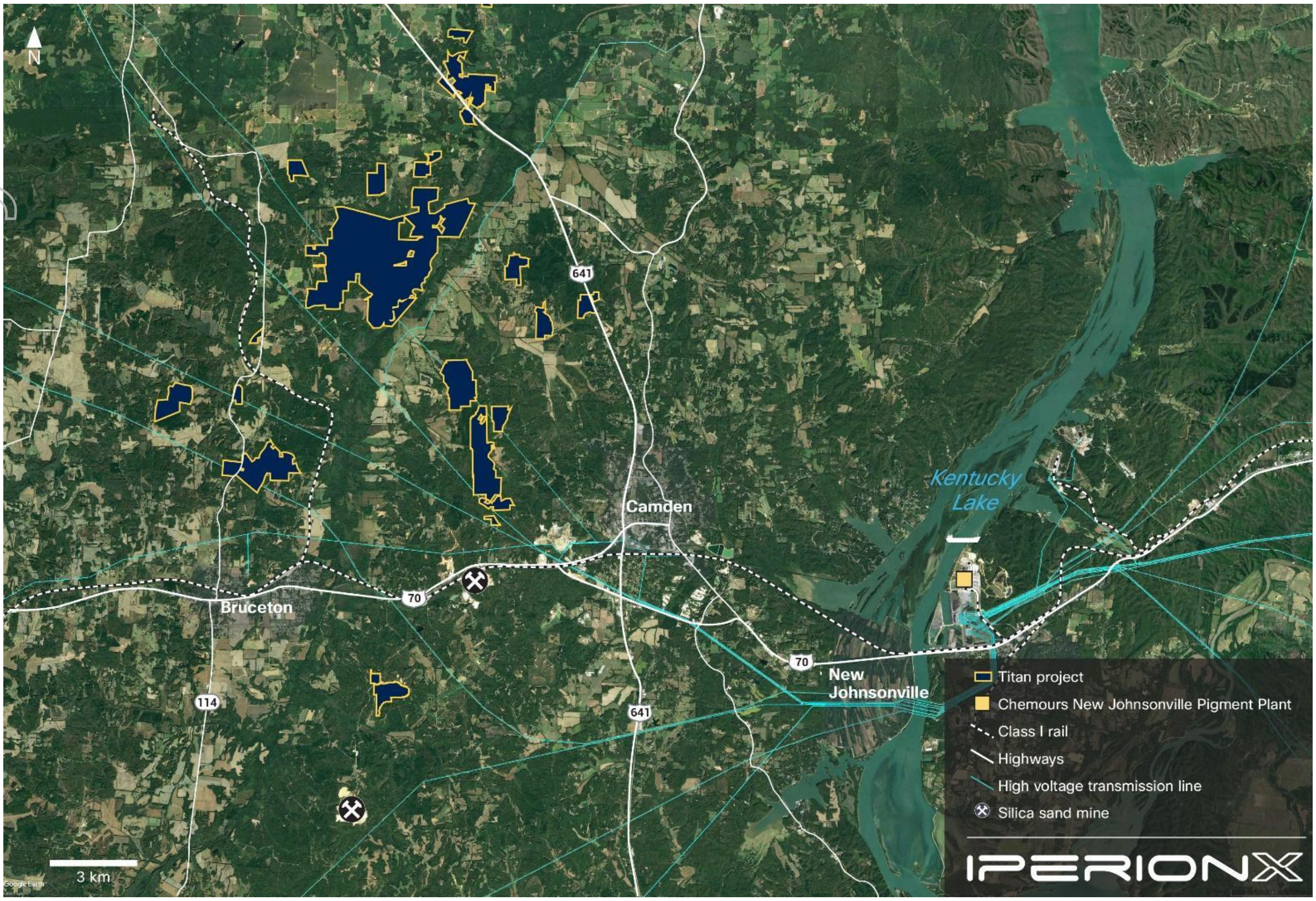


*Figure 15: Titan Project location and access to major rail, barge and port infrastructure.*

# 5. History

## 5.1 Previous Heavy Mineral Sand Mining in the Region

No previous heavy mineral sand mining has occurred in the region.

## 5.2 Previous Exploration

This area has been explored for HMS since the 1950s as the McNairy Sand was known to contain high concentrations of economic heavy minerals based on work by federal and state agencies. DuPont, Kerr-McGee, RGC, Iluka, Altair, and Astron are known to have evaluated the McNairy deposits in the Project area at various times; however, there has been no known heavy mineral production from the McNairy Sand in Tennessee.

# 6. Geological Setting, Mineralization, and Deposit

## 6.1 Regional, Local and Property Geology

The Titan Project's location in western Tennessee represents the eastern flank of the Mississippi Embayment, a large, southward plunging syncline within the Gulf Coastal Plain. This feature extends from southern Illinois to the north and to Mississippi and Alabama to the south. The embayment is filled with sediments and sedimentary rocks of Cretaceous to Quaternary age.

The McNairy Sand Formation represents a pro-grading deltaic environment during a regressive marine sequence. This is evidenced by the coarsening upward sequence grading from the glauconitic clay rich Coon Creek Formation to the fine lower member of the McNairy Formation to the coarser upper member of the McNairy Formation.

The main mineralized zone at the Project is hosted stratigraphically in the lower member of the McNairy Formation, the McNairy Formation dips gently into the west in the Project area. Mineralization averages 31 meters thick and has been traced, to date, for 6.2 kilometers along strike. The upper zone is also mineralized in some areas.

## 6.2 Deposit Model

Exploration of the Project area utilizes the depositional model described in the previous section, sedimentary relationships, topography, and geological unit controls to target areas for evaluation.

# 7. Exploration

## 7.1 Non-Drilling Procedures and Parameters

This section is not applicable to this TRS.

## 7.2 Drilling Procedures

All drilling for the Project has been roto-sonic. This method alternates advancement of a core barrel and a removeable casing (casing is used when needed to maintain sample integrity). The core barrel utilized for this Project is 4 inches in diameter with a 6 inch diameter outer casing. The core barrel is retrieved from the ground and the samples are recovered directly from the barrel into a plastic sleeve. All holes are drilled vertically. The sonic drilling method has been shown to provide representative unconsolidated mineral sands samples across a variety of deposits as it is a direct sampling method of the formation(s). At times water is used to create a head on the formation to help prevent run-up.

A roto-sonic drill rig, the Geoprobe 5140LS, utilized a 10 ft core barrel to obtain direct 5 ft samples of the unconsolidated geological formations hosting the mineralization in the Project area. All holes were drilled vertically which is essentially perpendicular to the mineralization. The sonic cores were used to produce approximately 2 kg samples for heavy liquid separation as well as further mineralogical analysis. Each core is measured, and the recovery is calculated as length of recovered core divided by length drilled (typically 10 ft).

The Mineral Resource is based on 107 drill holes totaling 4,101 m, and occupies an area roughly 6.2 km (north) by 3.6 km (east); the Mineral Resource is further broken up into several areas based on land holdings (land agreements). These range from 0.5 km (north) by 0.9 km (east) for the smallest area to 5.1 km (north) by 3.6 km (east) for the largest area. Figure 19 shows the drilling completed to date plan view, cross section and long section.

## 7.3 Hydrology and Hydrogeology

HDR is completing the one-year ground water base line study. No other hydrology and hydrogeology study has been completed.

## 7.4 Geotechnical Data

No geotechnical work has been completed.

# 8. Sample Preparation, Analyses, and Security

## 8.1 Sample Collection and Security

Roto-sonic drill core samples, typically 1.5 m in length, are collected directly from the plastic sample sleeve at the drill site. Some interpretation is involved as the material can expand or compact as it is recovered from the core barrel into the plastic sleeve. Each core is measured, and the recovery is calculated as length of recovered core divided by length drilled (typically 10'). Samples are logged for lithological, geological, and mineralogical parameters in the field to help aid in determining depositional environment, major geologic units, and mineralized zones. Total depth of the drillhole is recorded as well as any drilling issues/concerns that could impact sample representativeness. Samples are collected at regular (1.5m) intervals unless the geology/mineralogy warrant altering this as to co-mingle samples across major geological/mineralized boundaries.

All samples are panned and estimates made for the %THM and %SL. Logging is both qualitative (sorting, color, lithology) and quantitative (estimation of %THM, %SL) to help support the integrity of the Exploration Results and Mineral Resource estimate. Photographs are taken of the sonic cores. All pertinent sample information (geology, sample ID, etc.) are collected on sequentially numbered tag books provided by the laboratory. The tag is inserted into the sample bag and the information from the tag book is entered nightly into the Project database (GeoSpark).

The unconsolidated sonic cores are sampled by splitting the core in half lengthwise using a machete then recovering an even fillet with a trowel along the entire length of the sample interval. Sample volume is ~2 kg and is appropriate for the analytical method(s) being used and ensure adequate sample volume is collected. Samples are collected directly to the pre-labeled/pre-tagged sample bags; the remaining sample is further split into a replicate/archival sample and what remains is used to backfill the drillhole. A chip tray is maintained for each hole to keep a representative sample for each interval for later use during geological interpretation or between holes in the field or if any questions arise during modelling.

Sample bags are sealed with a zip tie at the drill site, placed in rice bags, and remain in the custody of the field geologist from time of collection until time of delivery to the Project's temporary storage location which is a secure third-party storage unit or within a leased barn. A red security tag is used to secure the top of each rice bag and these tags are verified by the lab to guarantee all sample bags are intact.

## 8.2 Laboratory Procedures

Drill samples are sent to SGS NA facility in Lakefield, ON, Canada. SGS is a qualified third-party laboratory not related to IperionX. Samples are subjected to standard mineral sand industry assay procedures of size fraction analysis, heavy-liquid separation, and chemical analysis. Samples are dry-screened at 44-micron (325 mesh) for slimes and 595-micron (30 mesh) for oversize. An 85 g aliquot of the -30/+325 sand is then submitted to methylene iodide diluted with acetone to target specific gravity of 2.95 g/cm3, the greater than 2.95 g/cm3 portion is dried and weighed to calculate the percent heavy minerals. The THM is calculated by adding the percent slimes and oversize to the total. Composites, based on geological domains, are then submitted for QEMSCAN analysis for mineralogical assemblage data. The mineral species determined from QEMSCAN are further combined and/or divided into groups representing anticipated products based on metallurgical test work for inclusion in the geologic block model.

## 8.3 QA and QC Controls

Accuracy monitoring has been achieved through submission of in-house heavy mineral sand standard reference materials (SRM) developed specifically for the Project. A low-grade and a high-grade SRM were produced with materials (HMs and silica sand) from the Project area to ensure representativeness. Each SRM was analyzed by the Project laboratory to generate a mean and standard deviations. SRMs are inserted at a 2.5% rate (1 every 40 samples). These SRMs are placed loose in a standard sample bag that is labeled sequentially as to mimic a typical drill sample and passed through the laboratory process "blind". A record of the SRM inserted and its sample IDs is kept in the Project database so that data can be matched up and reviewed. Standards were created multiple times during the Project and each time a new dataset was generated to compare against.

A quality control sample failure is any single sample 3 standard deviations from the true value for the comparison for each sample, or two out of three consecutive samples between 2 and 3 standard deviations, on the same side of the mean value (i.e. both above or both below the mean value). Should the errors for a particular batch exceed these limits, the section of a batch bracketed by the SRM samples (i.e. number samples on either side) are reviewed to determine if the SRM failures are material to the overall data for that batch or if the laboratory has had any procedural issues that need to be addressed. If necessary, samples are re-analyzed. Overall, the objective of the quality assurance program for resource purposes is a pass rate of >95%. A lower pass rate, on the order of 90% is acceptable for exploration purposes. Eleven SRMs (6 high and 5 low grade) were submitted during the drilling campaign for analysis and results were all within 3 standard deviations of the mean of the SRM.

Sampling precision has been monitored by selecting a sample interval at a 3% rate (3 every 100 samples) and taking a second fillet sample over the same sample interval. These samples are consecutively numbered after the primary sample and recorded in the sample database as "field duplicates" and the primary sample number recorded. Field duplicates are collected at the rate of approximately 3 in 100 samples and ideally should be collected when sampling mineralized sonic core intervals containing visible THM (panning). Analytical precision is also be monitored using HLS duplicates that the laboratory produces at a rate of approximately 3 in 100 samples. Data from these two types of duplicate analyses can be used to constrain sampling variance at different stages of the sampling and preparation process.

Field duplicates should have an average coefficient of variation (CoV) <10%, whereas laboratory duplicates should have an average CoV <5%. For the drilling results reported, 83 field duplicates were submitted to the laboratory with results showing a CoV of less than 10%.

The use of an 85 g sub-sample for heavy liquid separation (HLS) results in a relative precision of 4% based on repeat analyses of standard reference materials (SRM) at SGS. This sub-sample mass is therefore appropriate for the grain size being sampled.

Analysis of field duplicates indicates a relative precision of 31, indicating sampling of drill material presents the greatest uncertainty in the sampling procedure.

## 8.4 Opinion of Qualified Person

The QP is comfortable that the sample preparation, security, and analytical procedures are sufficient to reasonably support the mineral resource estimate in this TRS, in the opinion of the QP.

# 9. Data Verification

## 9.1 Procedures of Qualified Person

The QP has conducted several site visits throughout the drilling campaigns and metallurgical test programs. The site visits provided visual confirmation of mineralization, drill hole locations, bulk sample collection and logging and sampling procedures.

## 9.2 Limitations

None.

## 9.3 Opinion of Qualified Person

The QP is comfortable that the data is of a high quality and that no systemic or procedural issues that could impact the exploration results or mineral resource estimate are present that have not been reported in this TRS.

# 10. Mineral Processing and Metallurgical Testing

Four bulk samples were processed by Mineral Technologies through pilot equipment designed to emulate a full-scale Feed Preparation Plant (FPP), Wet Concentrator Plant (WCP), Monazite Flotation/Concentrate Upgrade Plant and a Mineral Separation Plant (MSP). Mineral Technologies is a reputable test laboratory with significant experience in mineral sands flowsheet development. Assays were conducted by SGS in Lakefield, Canada and Bureau Veritas in Perth, Australia, with XRF, laser ablation / ICPMS and QEMSCAN analytical methods.

The final products and the grades of those final products that were produced form the testwork demonstrated that the Upper and Lower  mineralized resource could be separated using processing stages common to most mineral sands' operations. Notably, the flotation test work achieved an overall 97% recovery of rare earth minerals in the final rare earth concentrate.

Based on the testwork results, it was concluded that a viable commercial operation could be established with appropriate processing options for a 10 Mtpa operation commencing in Benton area.

An overview of the Benton Upper and Lower and Camden Lower testwork programs are depicted in Figure 16.

Further confirmation test work is planned to proceed during the next phase of the Project development.

The QP of Exploration Results and Mineral Resources is comfortable that the samples are representative of the type and style of mineralization exhibited at the Titan Project, in the opinion of the QP.

The QP of Process Design is comfortable that the analytical procedures and data for the purposes used in this TRS are adequate, in the opinion of the QP.

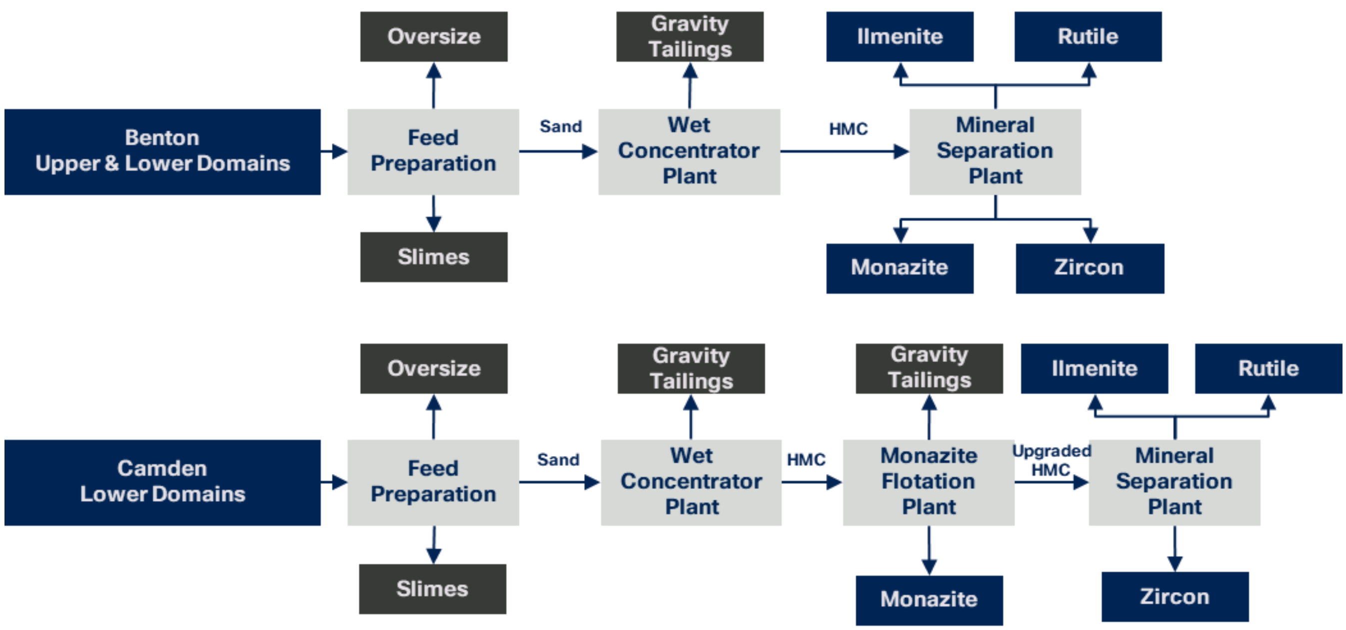


*Figure 16: Overview of initial metallurgical testwork program.*

*Figure 17: Rare earth (LHS) and heavy mineral concentrate (RHS) streams from wet shaking table tests after flotation.*

# 11. Mineral Resource Estimate

## 11.1 Assumptions, Parameters and Methods

The Mineral Resource occupies an area roughly 6.2 km (north) by 3.6 km (east); the MRE is further broken up into several areas based on land holdings (land agreements). These range from 0.5 km (north) by 0.9 km (east) for the smallest area to 5.1 km (north) by 3.6 km (east) for the largest area.

The base of mineralization ranges in RL from 90 m to 110 m above current sea level. Mineralization varies from 6 m to 51 m thick and averages 31 m thick. Mineralization resides primarily in two zones within the primary McNairy Sand unit. The grade interpolation was carried out using Vulcan software. Grade, slimes, and assemblage estimations were completed using inverse distance cubed (ID3) which is appropriate for this style of mineralization.

No THM top cut has been used or is deemed necessary for this deposit due to the geology, style, and consistency of the mineralization. Drill hole sample data was flagged with domain (zone) codes corresponding to the geological structure of the deposit and the domains imprinted on the model from 3-dimensional surfaces generated from geological interpretations. A primary search dimension of 212*425*3 m (X*Y*Z) was used for all assay data. Successive search volume factors of 2 and 4 have been adopted to interpolate grade in areas of lower data density. A parent cell size of 100*200*1.5 m was used. Parent cells are typically centered on the drill holes with a floating cell centered between drill holes along and across strike. A search orientation of 30 east of north was used to emulate the trend of the mineralization. No consistent plunge is apparent in the mineralization.

The Octant search option was used with minimum of 1 and a maximum of 5 samples per octant and a minimum of 2 octants being estimated to calculate the grade for a block. If the insufficient data was found within the first search, secondary and tertiary searches were used based on the search volume factors. In addition, a minimum of 2 samples were used from any particular drill hole. Standard mineral sands industry assay procedures (sizing 44-micron [325 mesh] for slimes and 595-micron [30 mesh] for oversize) heavy-liquid separation of an 85 g split of the -30/+325 sand using methylene iodide. For mineralogy, QEMSCAN analysis was utilized. A total of 107 drill holes for 2,626 THM assay samples (heavy liquid) and 181 THM and composite mineralogy (QEMSCAN) have been used to inform this MRE.

## 11.2 Mineral Resource Estimate

The maiden MRE for the Titan Project comprises 431 Mt @ 2.2% THM, containing 9.5 Mt THM at a 0.4% cut-off, and includes a high-grade core of 195 Mt @ 3.7% THM, containing 7.1 Mt THM at a 2.0% cut-off. Slimes and oversize material accounts for approximately 20% and 2.5% of the in-ground material respectively SL and OS values for the Scoping Study were derived from the metallurgical bulk sample testwork as it has been identified that the dry-screening method utilized for the drill samples tends to under-report SL and over-report OS. It should be noted that these discrepancies do not materially impact THM and a revised method (wet screening) for drill samples has been developed and tested for the Project moving forward in the next phase that will produce more accurate SL and OS values. There is a high level of confidence associated with the MRE classification, with 56% (241 Mt) classified as being in the Indicated resource category. Mineralization occurs as a single, large, and coherent near-surface deposit.

The MRE incorporates results from 107 sonic core drill holes for a total of 4,101 m drilled by IperionX during 2020 and 2021. This includes 45 new holes drilled during the Phase 3 drilling campaign in 2021, which are previously unreported. A further 109 holes totaling 3,566 m have subsequently been drilled outside of the MRE area and are in the final stages of processing. It is anticipated that these drill hole results will be incorporated into an upgraded MRE.

*Table 15: Mineral Resource Estimate and THM assemblage at 0.4% cut-off grade.*

| THM Assemblage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Cut off** | **Tons** | **THM %** | **THM** | **Zircon** | **Rutile** | **Ilmenite** | **REE** | **Staurolite** |
| | (THM %) | (Mt) | (%) | (Mt) | (%) | (%) | (%) | (%) | (%) |
| Indicated | 0.4 | 241 | 2.2 | 5.3 | 11.3 | 9.3 | 39.7 | 2.1 | 15.6 |
| Inferred | 0.4 | 190 | 2.2 | 4.2 | 11.7 | 9.7 | 41.2 | 2.2 | 13.7 |
| **Total** | **0.4** | **431** | **2.2** | **9.5** | **11.5** | **9.5** | **40.3** | **2.1** | **14.8** |

*Table 16: Mineral Resource Estimate and THM assemblage at 2.0% cut-off grade.*

| THM Assemblage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Cut off** | **Tons** | **THM %** | **THM** | **Zircon** | **Rutile** | **Ilmenite** | **REE** | **Staurolite** |
| | (THM %) | (Mt) | (%) | (Mt) | (%) | (%) | (%) | (%) | (%) |
| Indicated | 2.0 | 105 | 3.8 | 3.9 | 11.7 | 9.8 | 42.0 | 2.3 | 10.7 |
| Inferred | 2.0 | 90 | 3.5 | 3.2 | 12.1 | 9.9 | 42.1 | 2.3 | 10.8 |
| **Total** | **2.0** | **195** | **3.7** | **7.1** | **12.1** | **9.9** | **42.0** | **2.3** | **10.7** |

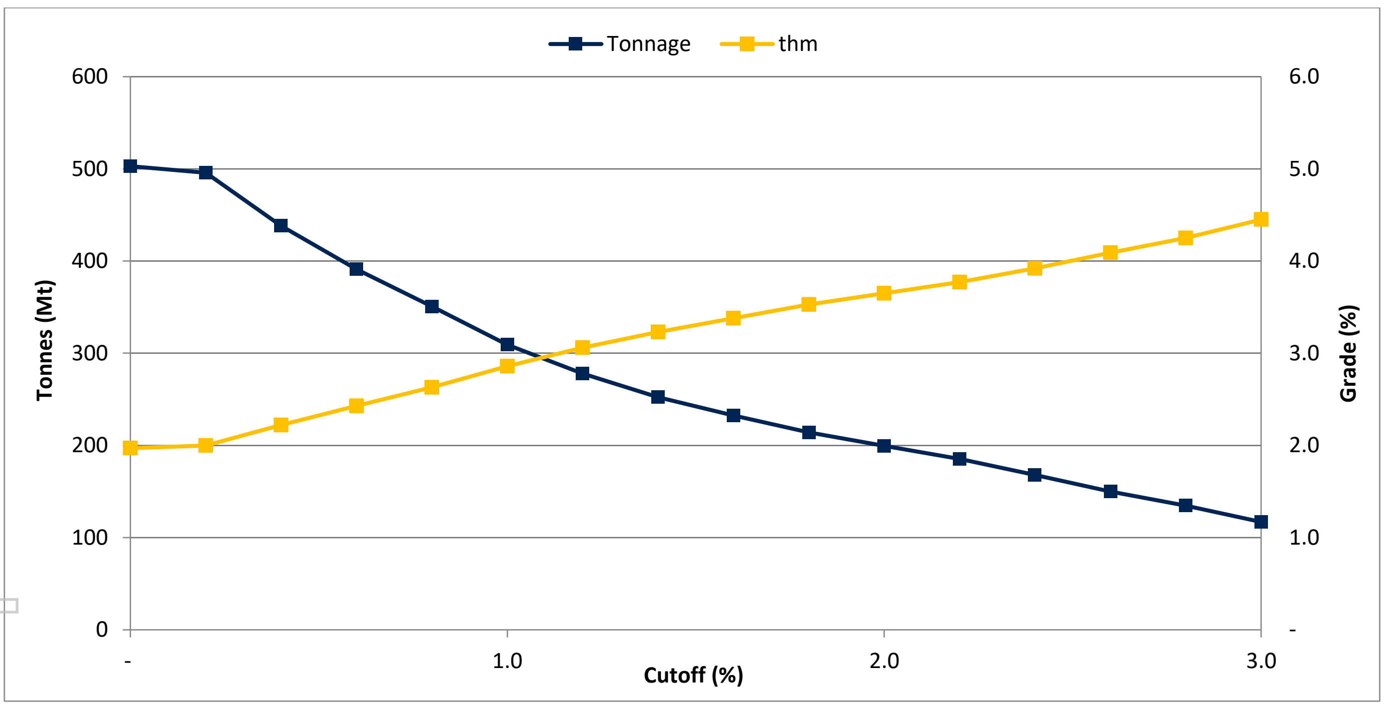


*Figure 18: THM grade cutoff v. tonnage curve.*

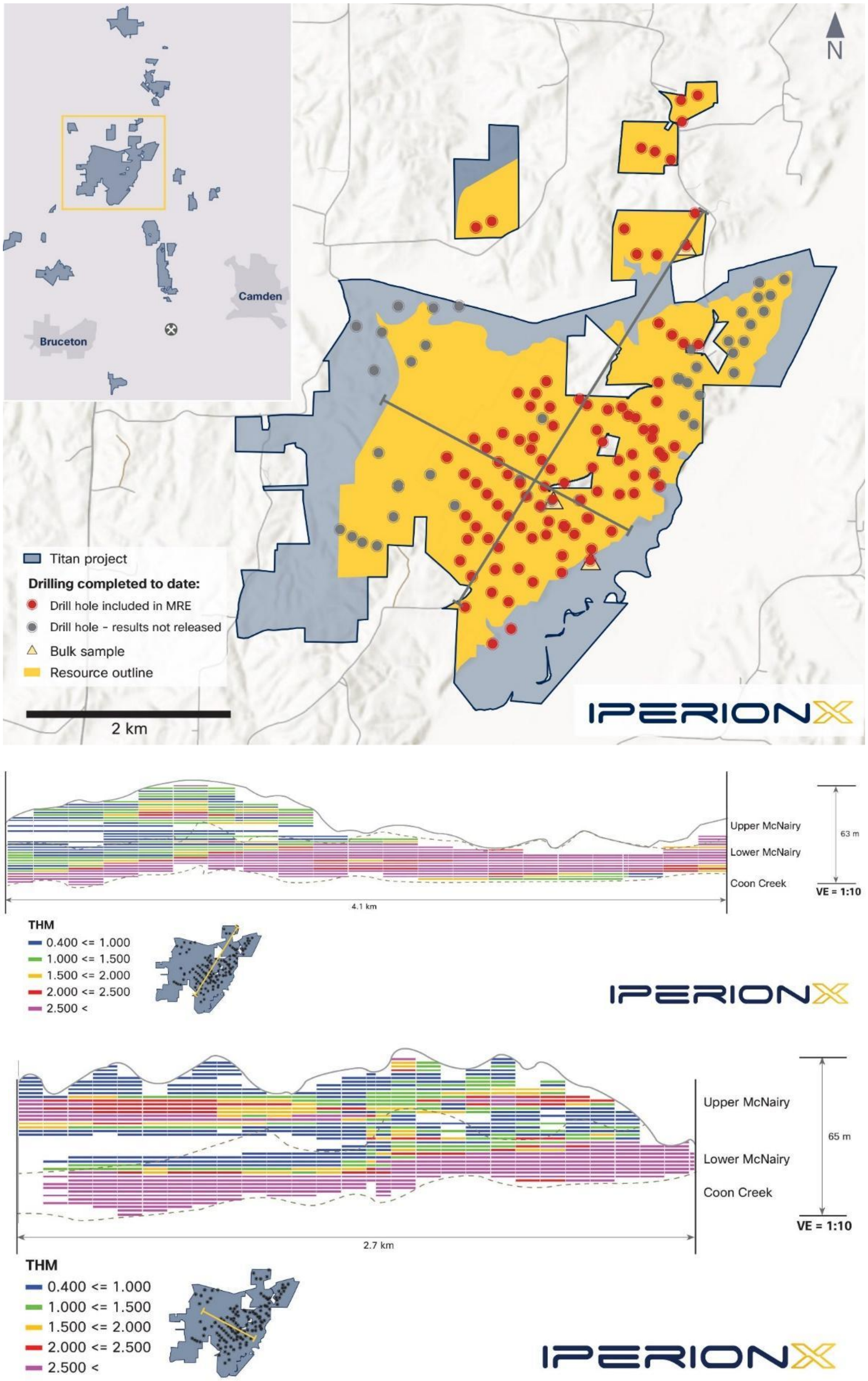


*Figure 19: MRE plan view, cross section and long section.*

The shallow, high grade and unconsolidated nature of mineralization enables the potential for simple mining operations supported by an industry standard mineral processing flowsheet. The Company is focusing on becoming the leading developer of low-to-zero carbon, sustainable, critical materials in the U.S., and is working with Presidio Graduate School's expert consulting division, PGS Consults, to undertake Environmental, Sustainability and Corporate Governance studies to define best practice mining and processing operations in this critical mineral province.

## 11.3 Geology and Geological Interpretation

The Titan Project's location in western Tennessee represents the eastern flank of the Mississippi Embayment, a large, southward plunging syncline within the Gulf Coastal Plain. This feature extends from southern Illinois to the north and to Mississippi and Alabama to the south. The embayment is filled with sediments and sedimentary rocks of Cretaceous to Quaternary age.

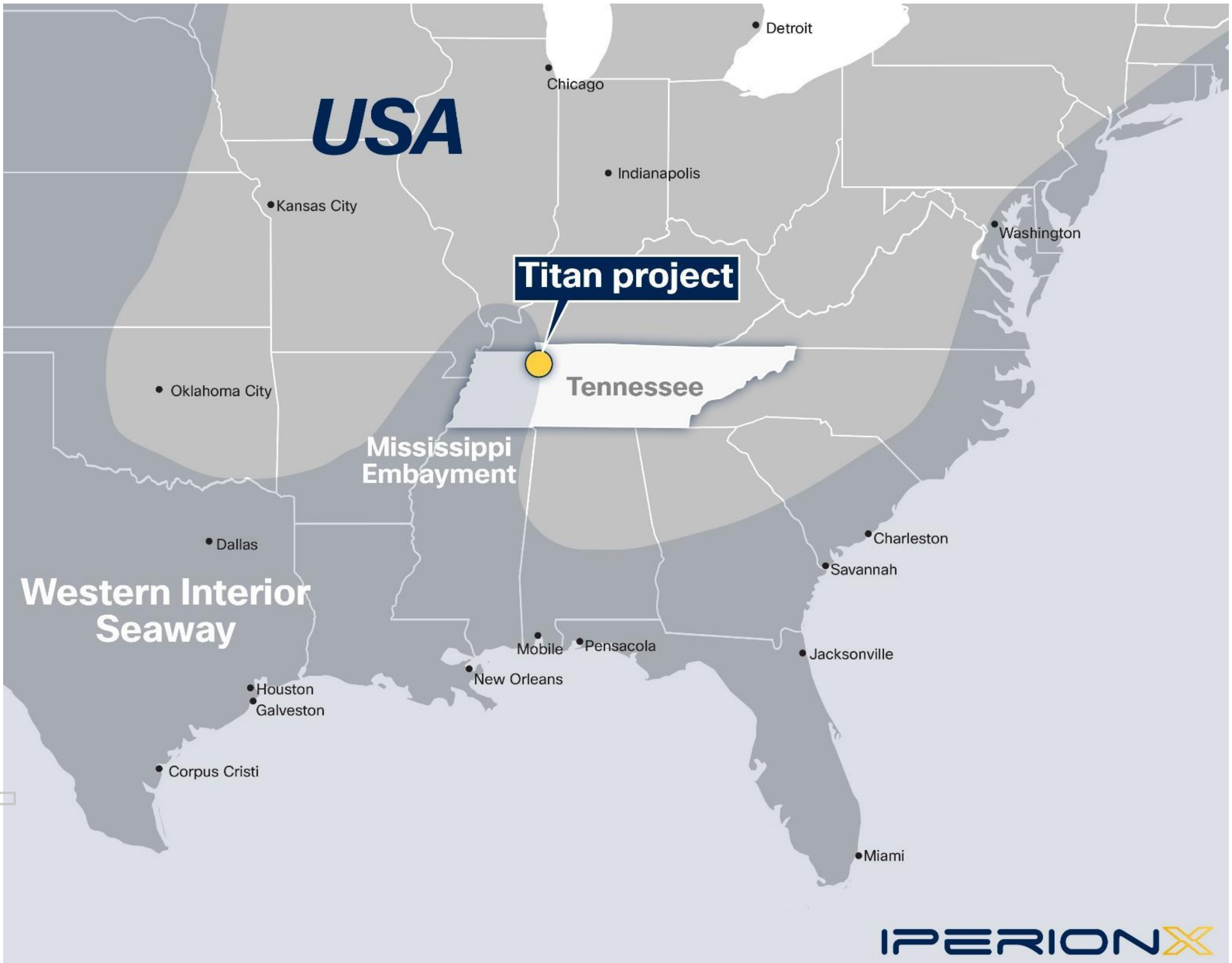


*Figure 20: Mississippi embayment & Cretaceous age coastline.*

The McNairy Sand Formation represents a pro-grading deltaic environment during a regressive sequence. This is evidenced by the coarsening upward sequence grading from the glauconitic clay rich Coon Creek Formation to the fine lower member of the McNairy Formation to the coarser upper member of the McNairy Formation.

The main mineralized zone at the Project is hosted stratigraphically in the lower member of the McNairy Formation. Mineralization averages 31 meters thick and has been traced, to date, for 6.2 kilometers along strike.

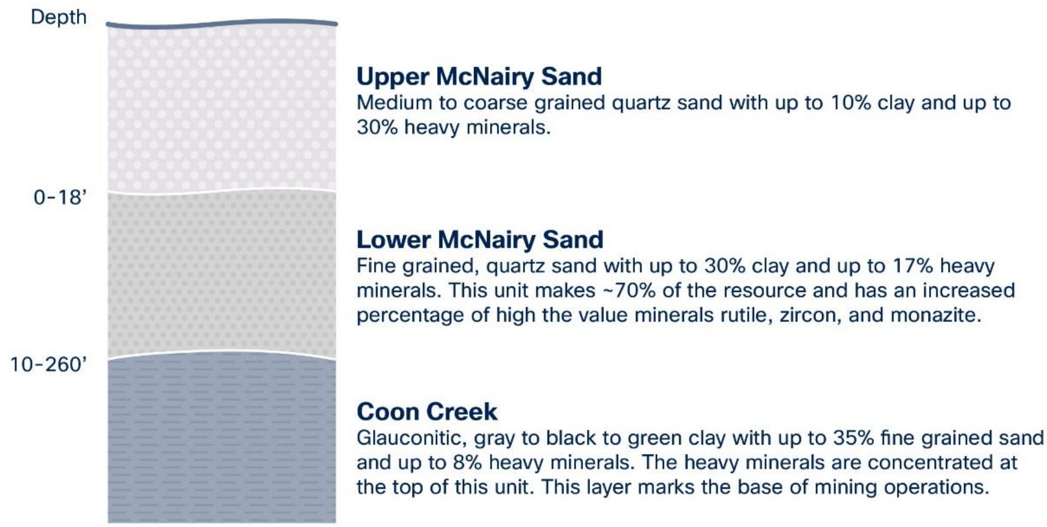


***Figure 21: Idealized cross-section of McNairy Sand.***

## 11.4 Drilling and Sampling Techniques

All drilling for the Project has been roto-sonic. This method alternates advancement of a core barrel and a removeable casing (casing is used when needed to maintain sample integrity). The core barrel utilized for this Project is 4 inch in diameter with a 6 inch diameter outer casing. The core barrel is retrieved from the ground and the samples are recovered directly from the barrel into a plastic sleeve. All holes are drilled vertically. The sonic drilling method has been shown to provide representative unconsolidated mineral sands samples across a variety of deposits as it is a direct sampling method of the formation(s). At times water is used to create a head on the formation to help prevent run-up.

A roto-sonic drill rig, the Geoprobe 5140LS, utilized a 10 ft core barrel to obtain direct 5 ft samples of the unconsolidated geological formations hosting the mineralization in the Project area. All holes were drilled vertically which is essentially perpendicular to the mineralization. The sonic cores were used to produce approximately 2kg samples for heavy liquid separation as well as further mineralogical analysis. Each core is measured, and the recovery is calculated as length of recovered core divided by length drilled (typically 10 ft).

Some interpretation is involved as the material can expand or compact as it is recovered from the core barrel into the plastic sleeve. Samples are logged for lithological, geological, and mineralogical parameters in the field to help aid in determining depositional environment, major geologic units, and mineralized zones.

All samples are panned and estimates made for the %THM and %SL. Logging is both qualitative (sorting, color, lithology) and quantitative (estimation of %THM, %SL) to help support the integrity of the Exploration Results and Mineral Resource estimate. Photographs are taken of the sonic cores.

The unconsolidated sonic cores are sampled by splitting the core in half lengthwise using a machete then recovering an even fillet with a trowel along the entire length of the sample interval. Samples are collected directly to the pre-labeled/pre-tagged sample bags; the remaining sample is further split into a replicate/archival sample and what remains is used to backfill the drillhole.

## 11.5 Sample Analysis Methodology

Roto-sonic drill core samples, typically 1.5 m, are sent to SGS NA facility in Lakefield, ON, Canada. Samples are subjected to standard mineral sand industry assay procedures of size fraction analysis, heavy-liquid separation, and chemical analysis. Samples are screened at 44-micron (325 mesh) for slimes and 595-micron (30 mesh) for oversize. An 85g aliquot of the -30/+325 sand is then submitted to methylene iodide diluted with acetone to target specific gravity of 2.95 g/cm$^3$, the greater than 2.95 g/cm$^3$ portion is dried and weighed to calculate the percent heavy minerals.

The THM is calculated by adding the percent slimes and oversize to the total. Composites, based on geological domains, are then submitted for QEMSCAN analysis for mineralogical assemblage data.

## 11.6 Resource Estimation Methodology

The Mineral Resource occupies an area roughly 6.2 km (north) by 3.6 km (east); the MRE is further broken up into several areas based on land holdings (land agreements). These range from 0.5 km (north) by 0.9 km (east) for the smallest area to 5.1 km (north) by 3.6 km (east) for the largest area.

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No THM top cut has been used or is deemed necessary for this deposit due to the geology, style, and consistency of the mineralization. Drill hole sample data was flagged with domain (zone) codes corresponding to the geological structure of the deposit and the domains imprinted on the model from 3-dimensional surfaces generated from geological interpretations. A primary search dimension of 212*425*3 m (X*Y*Z) was used for all assay data. Successive search volume factors of 2 and 4 have been adopted to interpolate grade in areas of lower data density. A parent cell size of 100*200*1.5 m was used. Parent cells are typically centered on the drill holes with a floating cell centered between drill holes along and across strike. A search orientation of 30 east of north was used to emulate the trend of the mineralization. No consistent plunge is apparent in the mineralization.

The Octant search option was used with minimum of 1 and a maximum of 5 samples per octant and a minimum of 2 octants being estimated to calculate the grade for a block. If the insufficient data was found within the first search, secondary and tertiary searches were used based on the search volume factors. In addition, a maximum of 2 samples were used from any particular drill hole.

## 11.7 Classification Criteria

The resource classification has been predominantly determined by the drill hole density reflecting the geological confidence. Supporting data are of suitable quality for resource estimation. Resource material defined by sampling with an approximate density of 212mE-W by 425mN-S by 3mRL and having sufficient mineralogy data has been assigned an Indicated Resource classification, material defined by sampling with an approximate density of 305mE-W by 610mN-S by 3mRL with some mineralogy data has been assigned an Inferred Resource classification. Approximately 56% of the Mineral Resource is classified in the Indicated Mineral Resource category and approximately 44% is classified in the Inferred Mineral Resource category. Variograms are run to test spatial continuity within the selected geological domains. Down hole and directional variography are run using 'R' software and Vulcan version 2021.3.

*Table 17: Sources of uncertainty.*

| Source of Uncertainty | Discussion |
|---|---|
| **Drilling** | All drilling has been roto-sonic drilling. The roto-sonic drill rig provides a representative sample, with sufficient recoveries of unconsolidated sand, in order to represent the in-ground material and is suitable for use in the MRE. |
| **Sampling** | Field duplicates are taken at a rate of 3% in order to identify in biases or inconsistencies. Examination of these duplicates indicates satisfactory performance of the sampling. |
| **Geological Modelling** | The geological model is supported with sufficient drill data. The Coon Creek formation is reached in >95% of the holes used the model. This provides a sufficient base to the extractable mineralization. Discrimination between the upper and lower members of the McNairy Sand Formation is easily identified by the relative difference in grain size and the presence of micas within the lower member. |
| **Estimation** | The estimation techniques used are suitable for the deposit type and mineralization style. All data is log transformed and shows normally distributed grade data. A validation infill program will be executed in a future study in order to gain additional confidence in the estimation. |

## 11.8 Cut-off Grade

A nominal bottom cut of 0.4% THM is offered, based on preliminary assessment of resource value and anticipated operational cost evaluated through preliminary engineering work.

SEC Regulation S-K 1300 requires that all reports of Mineral Resources must have reasonable prospects for eventual economic extraction regardless of the classification of the resource.

As detailed in the Scoping Study, Mineral Resources are amenable to exploitation, incorporating a multi-decade mine life and the application of conventional mining and processing technology. IperionX has used TZMI as the basis for pricing of ilmenite, rutile and premium zircon products, and Adamas Intelligence for monazite concentrate. Prices are detailed in Table 21, with recovery factors of 82.6% for ilmenite, 60.9% for rutile, 77.1% for monazite concentrates and 90.8% for zircon products. The QP has used this information as the basis for determining reasonable prospects for eventual economic extraction.

## 11.9 Mining and Metallurgical Methods and Parameters

The MRE assumes that the deposit will be mined by standard mineral sands dry-mining methods and hydraulic excavator/shovel with a mobile mining unit. It has been assumed that mineralized resource will be transported to the wet concentrator plants after extraction via slurry pipeline(s).

Metallurgical testing has been conducted, with 3 bulk samples collected from both upper and lower mineralized horizons as well as spatially throughout the deposit footprint. Each bulk sample was processed by both wet (gravity) and dry (magnetic and electrostatic) methods to produce ilmenite, rutile, zircon, and monazite/xenotime concentrates.

Products were further analyzed by QEMSCAN, XRF and ICPMS to provide scoping-level product and quality information for use in assessing salability and markets. Product information has not been included in the block model at this stage of the Project.

## 11.10 Qualified Person's Opinion

Based on a review of the data, third party verification of data integrity and validation of the block model, the QP believes that this is an accurate representation of IperionX's heavy mineral sand resource.

# 12. Mineral Reserve Estimate

This section is not relevant to this report.

# 13. Mining Methods

## 13.1 Geotechnical and Hydrogeology

For the purpose of this study, no geotechnical or hydrological test work has been completed on the Project area. Preliminary mining void designs have been provided by IperionX utilizing batter and berm configuration have been used for the purpose of defining potential mining limits

Exploration data suggests that the water table is 5 m below ground surface, but no water flow rate information has been provided.

### 13.1.1 Hydrology

No formal hydrology work for surface or sub-surface water flows has been completed and therefore for the purpose of this study the following main assumptions have been made:

1. Restricted areas due to region surface water management have adequately been defined with the provision of surface water buffer zones.
2. Ground water is not expected to present a pit wall stability issue and will be managed through the use of in-pit pumping associated with the sand tailing water reclaim system.
3. All surface water that interacts with the active mining areas will remain in the mine water management system and all surface water that does not interact with the active mining area will be diverted to natural water ways that move the water from the mining areas.
4. All mine water used for the transportation of the mineralized material to the Wet Concentrator Plant (WCP) and used in the transportation of sand tails returned to the pit working area will be controlled within the mine water management system which will prevent mine water from leaving the boundary of the mining areas in an uncontrolled fashion.
5. All mine water management system components (pumps, storage dams and pump lines) are adequately sized to manage expected peak performance requirements for high flow rates.
6. Ancillary mine water for use in dust suppression and all WCP water supply will be drawn from the Mine Water Management System.

Hydrology studies to validate these assumptions are required for the next study phase to provide direct input into the design elements.

### 13.1.2 Geotechnical

The depth of the planned workings below the surface varies from 25 to 40 m below an average ground surface of 125 m Above Sea Level (ASL). The depth is increased due to the terrain in the region having hills reaching 165 m ASL. This combination could result in pit void wall extending from 165 m to 80 m, creating 85 m walls. With this potential operating face height, the geotechnical design for the wall must be considered in detail, considering the impact of the material types, the material mechanical characterization, the moisture content, potential of hydraulic pressures and geological structures.

With these geotechnical, hydrology and material characterization test work still to be done, preliminary designs for the mining voids have used batter and berm configurations from similar mineral sands type projects. These slopes are adequate for the purpose of this study but will require refinement in future studies taking into account the local conditions and geometry.

The selected batter and berm configuration is based on 35-degree batters over a vertical height of 10 m and 5 m berms widths resulting in an overall pit slope of less than 28.6 degrees.

The final pit walls are assumed to have this configuration over the exposed working area side wall exposure, prior to back filling of the mining void. This "open pit mining approach" limits the time of exposure of the mined void walls potentially allowing for more aggressive wall angles to be considered.

## 13.2 Mine Design and Rehabilitation

The basic mining cycle is depicted in Figure 22, which shows the mine cycle from clearing to final condition post mining. The sequential mining method allows for low cost, reduced area footprint and environmentally logical mining process by limiting the change in final material location with the mineralized material and waste basically being returned to a similar position in the ground strata. This proposed method of mining cycle is well proven in heavy mineral sands industry with progressive backfill and rehabilitation to the pre-mining state.

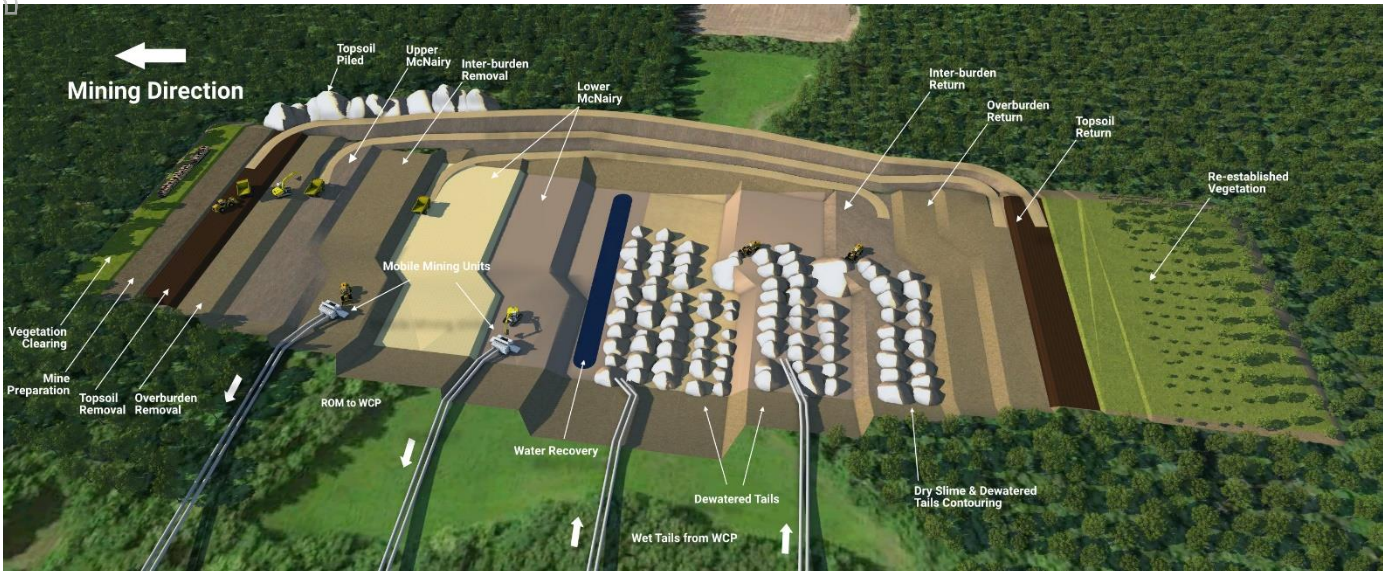


*Figure 22: Titan Project mining cycle.*

The mineralized material would be mined using excavator or front-end loader feeding an in-pit mining unit or mobile mining unit (MMU). The MMU would then transport the mined mineralized material in slurry form to the Wet Concentrator Plant (WCP).


*Figure 23: A – Example mobile mining unit mineralized material feed (courtesy of Mineral Technologies); B – Example dry mining of waste; C – Example wet sand tails waste.*

The topsoil and dry waste will be mined using conventional excavator/loader and truck mining practices applied in an open pit mining approach, with the objective of limit trucking distances and size of the open mining void. This will minimize the mining operating costs and minimize mining footprint on the environment. Equipment for dry mining will likely consists of a contracted mining fleet for all activities for the mining of the mineralized material and waste including the mining of the mineralized material to the input mining unit.

The wet waste sand from the WCP is returned via pipeline to the mine workings where it is discharged by a cyclone cluster that dumps retrieves water from the waste stream, dumping high solid content sands into a cone. This sand will then be moved be spread by the dozers, with the dewatered slimes from WCP being returned to the mining void by trucks prior to being covered by the dry overburden and inter-burden.

The mining process is commenced with the excavation of the pre-mining void. The initial mining void sets up the working faces and working space to allow the open pit mining approach to operate its full cycle.

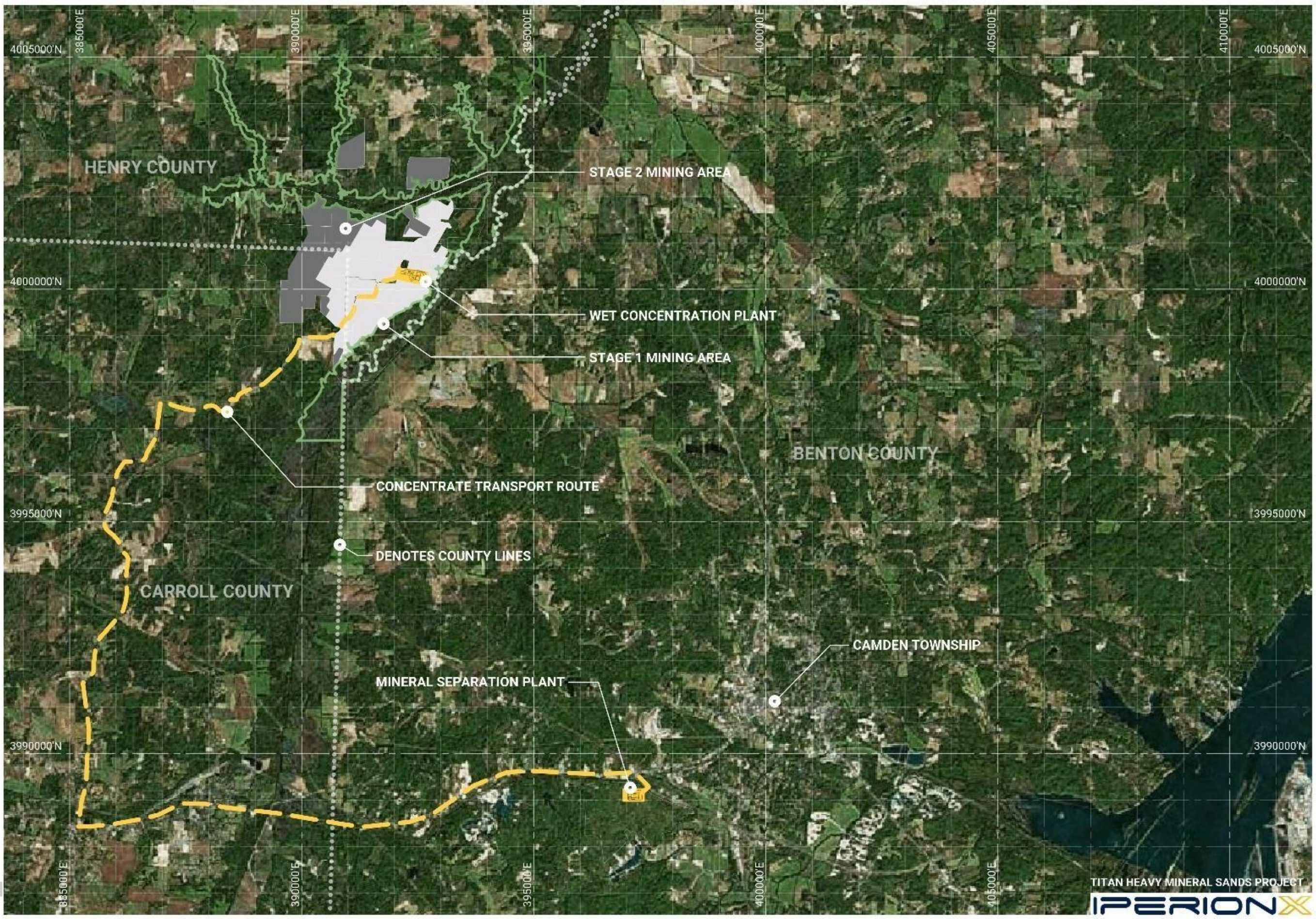


*Figure 24: Titan Project site plan and mining area.*

## 13.3 Production Target and Mine Schedule

Pit optimizations were completed in order to produce a production schedule on an annual basis. This resulted in a total Production Targets of 243 Mt @ 3.0% THM In-Situ with a mine life of 25 years. The mining schedule delivers an outcome with the first 14 years mining 100% of indicated mineralized resource only, and the remaining years mining the inferred mineralized resource, resulting in a total mine life of 25 years. The schedule is based on 57% of the total mine ROM material being in an Indicated category.

*Table 18: Mine production schedule with % Indicated category processed by time period.*

| Year | ROM Tons | Inferred Tons | Indicated Tons | % Indicated Tons |
|---|---|---|---|---|
| | *(Mt)* | *(Mt)* | *(Mt)* | *(%)* |
| 1-14 | 136.5 | - | 136.5 | 100% |
| 15-25 | 106.1 | 105.3 | 0.8 | 1% |
| **LOM** | **242.6** | **105.3** | **137.3** | **57%** |

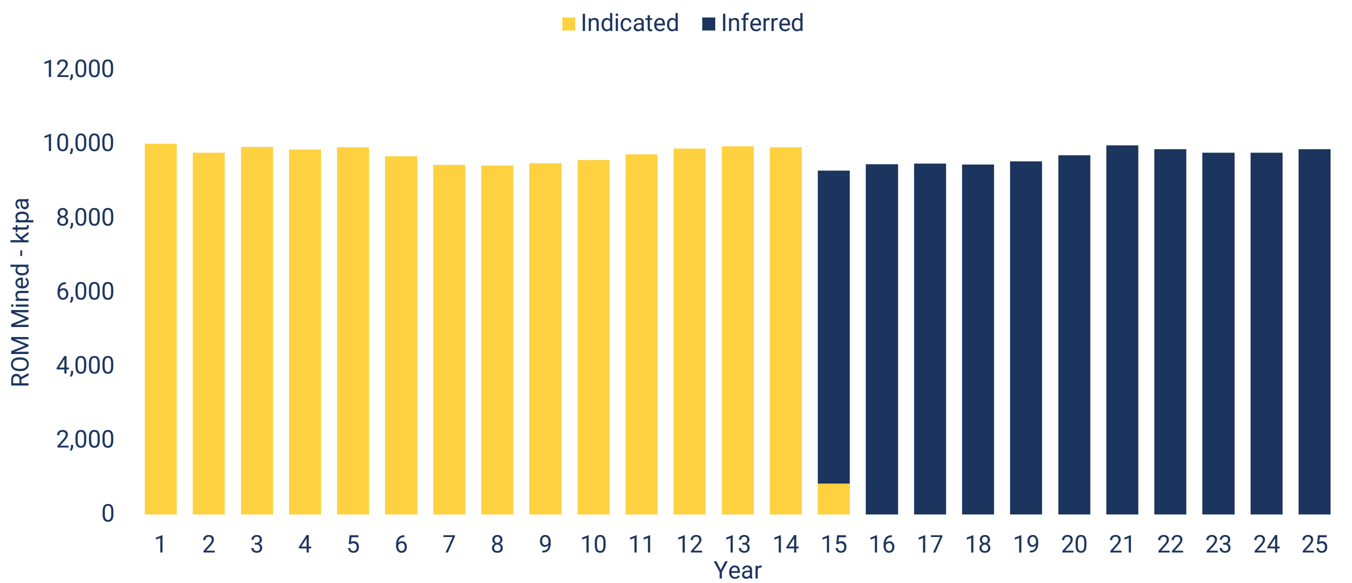


*Figure 25: Titan Project Indicated and Inferred material split over mine life.*

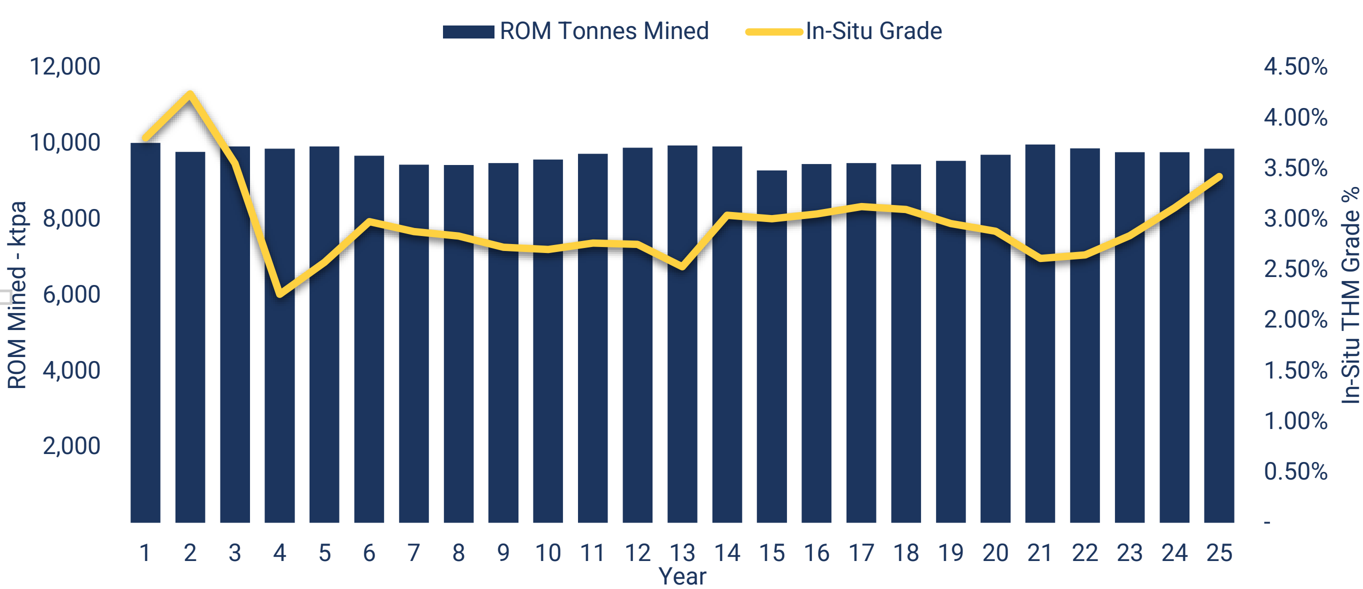


*Figure 26: Titan Project production targets and grade profile.*

Each of the solids of the various mining limits is bound by the constraining limits being: lease boundaries, flood plain buffer, the Coon Creek basement surface and regional topography. All physicals used for mine scheduling and financial modelling in this report are inside (sub-set of) these mining limits.

With these geotechnical, hydrology and material characterization test work still to be done, preliminary designs for the mining voids have used batter and berm configurations from similar mineral sands type projects. These slopes are adequate for the purpose of this study but will require refinement in future studies taking into account the local conditions and geometry.

The selected batter and berm configuration is based on 35 degree batters over a vertical height of 10m and 5m berms widths resulting in an overall pit slope of less than 28.6 degrees.

The mine schedule is planned to provide a continuous rougher head feed rate of 1,000 tons per hour. The cut-off grade is defined at 1.00% HM based on preliminary economic assessment.

Given the nature of the resource model, the block dimensions and the type of deposit, dilution  is assumed to be included in into the modelled blocks, requiring no further modification for the purposed of this study in scheduling physicals for the financial model inputs.

The mining recovery factor based on the planned mining equipment and the resource model block dimension, the selective mining units is a small percentage of a parent block size and therefore in practice should be 100%.

Assumed values of 10% slime for the Upper McNairy and 20% for the Lower McNairy.

The start point was selected to provide immediate access to high grade material in the Indicated mineral resource category. The schedule was based on reporting the optimized physicals for the blocks in panels and then mining in the general sequence shown. The sequence for the East block results in the final stages of mining in year 5 being beside the WCP but also adjacent to the waste stockpiles created by the excavation of the initial mining void.

The second phase of the general scheduling has the workings moving the western areas of the current Indicated mining limits. This satisfies the requirement of Indicated mineral resource category only initially then allowing Indicated & Inferred mineral resource category at the tail of the schedule.

The general mining sequence adopted for the schedule is south to north in full width panels. This is done intentionally to avoid mineralized material loss from having parallel narrower mining paths which will result in mineralized material loss in the Lower McNairy due issues of mining adjacent to a previous mining path.

The final phase of the Project as known is the scheduling of the inferred mineral resource category from south to north, in the same manner as done for the second phase.

# 14. Processing and Recovery Methods

An overview of the major processing stages can be described as follows:

1. Run of mine mineralized resource is processed in the Mobile Mining Unit (MMU) which removes trash & oversize. The undersize is pumped to the Feed Preparation Plant (FPP) and Wet Concentrator Plant (WCP).
2. In the FPP, the feed is de-slimed to separate clay and the sand. The slimes are directed to the thickener where they are thickened and then filtered. The sand fed into a constant density tank which is pumped to the rougher spiral stage at 1,000 tph at the start of the WCP.
3. The WCP comprises of multiple stages of spiral separators which produce a tailings and a Heavy Mineral Concentrate (HMC) stream. The WCP tailings stream is dewatered and pumped to the mining void while the HMC (at a target grade of >85% THM) is dewatered and trucked to the Monazite Separation Plant.
4. The Monazite Separation Plant which consists of a flotation circuit and wet gravity circuits, to produce a monazite product and an upgraded HMC which consists predominantly of the titanium minerals & zircon minerals. The upgraded HMC is the feedstock for Mineral Separation Plant (MSP).
5. The MSP consists of a dryer, multiple stages of electrostatic separators, magnetic separators and wet gravity separators to produce ilmenite, rutile, premium zircon and zircon concentrate.

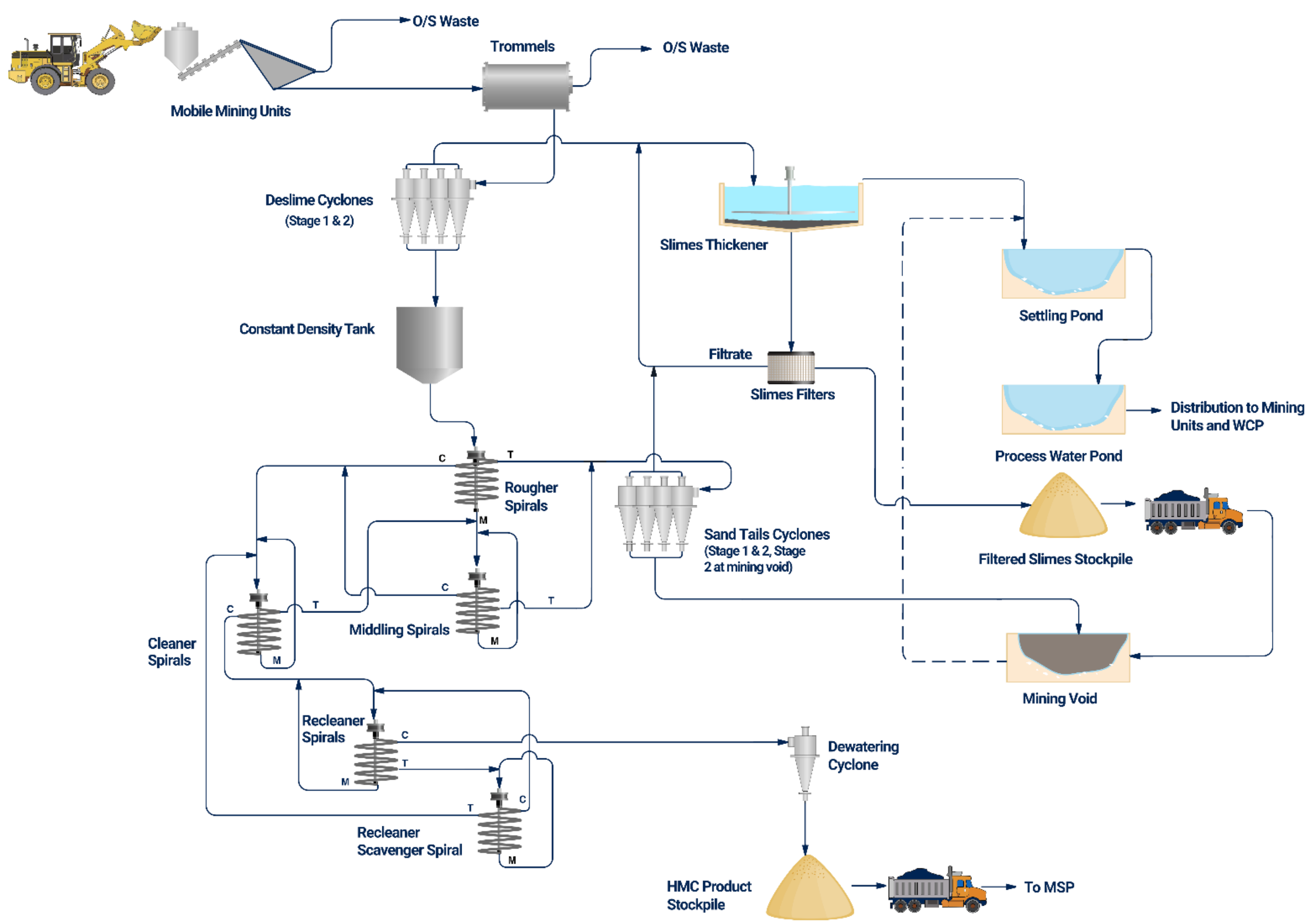


*Figure 27: Titan Project mining and wet concentration plant simplified process diagram.*

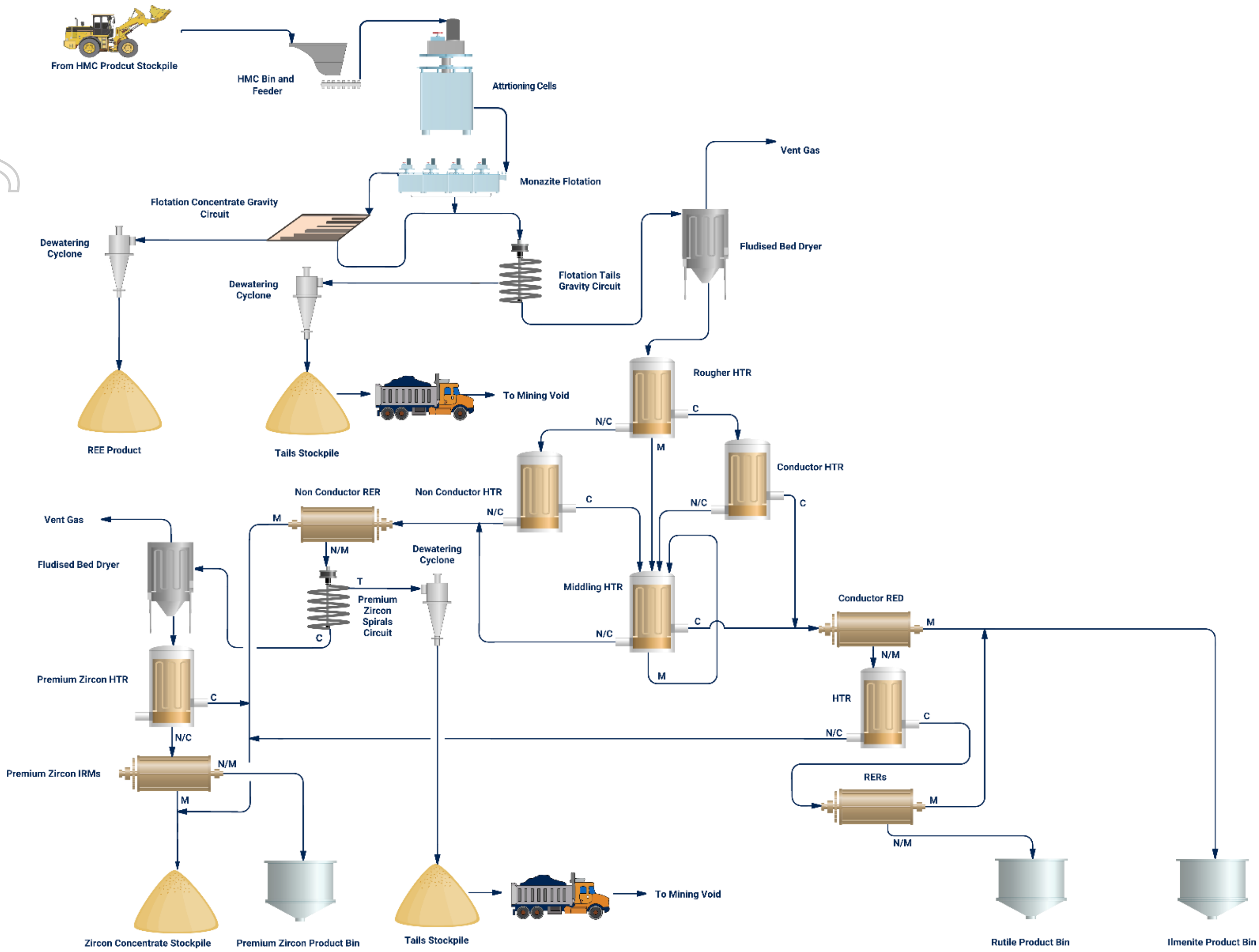


*Figure 28: Titan Project mineral separation plant simplified process diagram.*

The processing plant is designed to process 9.7 Mt/y ROM material, and will produce approximately 95,500 t/y ilmenite, 16,700 t/y rutile, 4,600 t/y monazite concentrate, 22,400 t/y premium zircon and 16,000 t/y zircon concentrate on a life-of-mine average basis.

An estimate of the power demand for each area is 11.4 MW at the mine and WCP facility, and 2.2 MW at the MSP facility.

An allowance has been made for production, maintenance and management personnel associated with running the mine and processing plant. Rosters are based on 12 hours per shift, 2 shifts per day and 4 rotating crews. Further rationalization of operational requirements for ramp-up will be reviewed in the PFS. An estimated total of 179 personnel are required for mine, WCP and MSP.

## 14.1 Mobile Mining Units (MMU)

The MMUs receive run-of-mine (ROM) mineralized resource fed by a loading tool. These units are designed to move along with the mining face. Separate to the MMU but integral to its operation is a static scrubber/trommel which sits on the side of the mining area. The trommel protects the equipment by removing any grossly oversize material including vegetation.

'Shredders' are included to assist with the liberation of the clay from the sand minerals. The material existing the 'shredder' is pumped to the scrubber/trommel which is stationed on the side of the mining area. The scrubber/trommel breaks down larger material clumps through slurry rotational motion and spray water is also injected into the second half of the unit to help liberate the clay from the sand. The >2 mm particles at the end of the scrubber are rejected to directly back to the mining void. The <2 mm material is then pumped from the scrubber/trommel to the WCP where the clay is firstly separated from the sand.

## 14.2 Feed Preparation Plant (FPP) and Wet Concentration Plant (WCP)

### 14.2.1 Feed Preparation Plant (FPP)

The <2.0 mm ROM will be pumped into cyclones to separate out the slimes. The cyclone overflow containing the slimes will report to a thickener where they will be treated with flocculant to produce a high solids concentration slurry. Thickener underflow is pressure filtered and stockpiled for disposal via truck back to the mining void. Thickener overflow is recirculated as process water to the WCP and MMUs.

The cyclone underflow reports to a Constant Density (CD) tank. The CD tank provides several roles. The design of the CD tank distributes the sand so that the discharge output can be controlled. Therefore, any fluctuations in tonnage upstream (mining units) are eliminated, allowing constant steady operation of downstream WCP. Similarly, the discharge density can also be controlled by injecting water into the sand by a dedicated injection water pump. The CD tank also provides surge capacity that allows continued operation of the WCP in the advent of any mining interruptions. The CD tank can also provide a secondary desliming stage through the overflow launder.

There are also two discharge pumps on the CD tank feeding two parallel spiral circuits. This premise is to ensure that at a minimum, the plant can operate at half capacity if there are any downtime issues with mining units. The sand from the CD tank is discharged at the nominated solids concentration (% solids) suitable for processing over spiral separators.

### 14.2.2 Wet Concentrator Plant (WCP)

The WCP will have two parallel circuits which comprise of a combination of MG12 and HG10i spirals to concentrate the heavy mineral component of the ROM into an HMC. The tailings stream from the spiral circuit is pumped to the mining void where it is dewatered via cyclones with the underflow discharging into the mining void and the overflow is reused in the WCP via the thickener. The HMC from each of the parallel circuits is combined. The final stage of the WCP is desliming cyclones and an HMC stacker. Return water from the cyclone is reused in the WCP via the thickener.

The HMC stacker HM can slew between three stacking positions so that while one stockpile is being stacked, one is being removed, leaving the last one to drain.

A front-end loader is used to load the damp HMC into trucks for transport to the Mineral Separation Plant.

The WCP installation also includes support infrastructure such as the tailings thickener, process water dam and tanks, workshop, administration buildings, and a HMC stockpile. The WCP design and construction will ensure that the plant is suitable to be moved if required.

## 14.3 Mineral Separation Plant (MSP)

HMC from the WCP is trucked to the MSP where it is processed through the Monazite Flotation Plant (MFP) to produce a monazite product and an upgraded HMC as a feedstock for the Mineral Separation Plant (MSP). HMC from the MSP HMC stockpile is reclaimed by front end loader and fed to the MFP via bin and feeder.

### 14.3.1 Monazite Flotation Plant (MFP)

The reclaimed HMC is conditioned to make the monazite mineral amenable to flotation. A two stage (rougher-scavenger) float circuit is employed to help with the recovery of the monazite. After flotation, the concentrate (float) is upgraded by wet gravity tables that are used to remove any residual heavy minerals and other impurities.

The monazite product produced from these tables is then filtered to reduce the moisture content (to approximately 5%). By not completely drying the monazite product, it reduces the risk of airborne particles and dust. This stream is then conveyed to a product bin, and then loaded into specially designed 200L drums ready for transport.

The (rougher-scavenger) float circuit tailings (sinks) are then further upgraded using three stages of spirals to remove the remaining quartz and trash heavy mineral that is still present. The spiral tailings stream is dewatered and transported back to the mining void. The concentrate then goes to the MSP where it is dewatered using a belt filter and dried in readiness for separation to make ilmenite, rutile & zircon products.

The metallurgical testwork has shown that rare earth minerals (REM) can be separated readily from the other valuable heavy minerals using flotation techniques.

### 14.3.2 Mineral Separation Plant (MSP)

As discussed above, the frontend electrostatic circuit of the MSP Process Option 2 is the same as process Option 1 MSP. This also includes the ilmenite and rutile magnetic circuit.

With Process Option 2, the non-conductors stream containing nearly all of the zircon mineral, plus residual staurolite, residual quartz, and some miss placed titanium minerals is further processed to produce a premium zircon product plus a smaller zircon concentrate stream which will contain residual zircon mineral, plus residual staurolite, residual quartz, and some titanium minerals.

The separation of the zircon from the non-conductors stream begins when the material is passed over a rare earth roll separator (RER). In the RERs, the zircon reports to the non-magnetic stream and other materials such as staurolite and other magnetic minerals to the magnetics stream. The magnetics stream is directed to the zircon concentrate product.

The zircon is then processed in a wet gravity circuit to remove quartz and other light heavy non-magnetic minerals resulting in an upgraded zircon stream. The wet zircon concentrate is then dried and further processed through electrostatic separation stages and magnetic separation stages. The conductors from the electrostatic separators are directed to the zircon concentrate, while the non-conductors collected and processed over two stages of induced roll magnetic separators. The cleaned non-magnetics become the premium zircon product, with the magnetics stream being directed to the zircon concentrate.

# 15. Infrastructure

IperionX's Titan Project is strategically located near Camden, Tennessee, and will benefit from significant cost advantages due to the location and proximity to low cost, world-class infrastructure.

95,000 miles of highway, including 8 interstate highways, put Tennessee within a day's drive of a majority of U.S. consumer markets. Tennessee is the third largest rail center in the U.S. and there are more than 1,000 miles of navigable waterways which access all other major waterways in the eastern U.S. There are over four commercial airports near Camden, including two international airports at Memphis and Nashville.

This world class infrastructure is expected to provide material cost and logistics advantages compared to projects located in more remote areas. The existing infrastructure includes low-cost power and gas, with high-capacity transmission lines near the Project, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports. Potential water sources include nearby surface water bodies but will likely involve shallow groundwater.

Site infrastructure is an essential component to the success of the Project. The Project's mineral sands resources and nearby Wet Concentrator Plant (WCP) are located approximately 17 miles northwest of the city of Camden, Tennessee. The Project also includes a dry Mineral Separation Plant (MSP) that is located approximately 1.3 miles southwest of the city of Camden, Tennessee. The distance separating the two plants is approximately 19 miles and accessed via public roads and highways.

The MSP is just 2 miles from Highway 70 and Highway 641, 15 miles from Interstate 40 and is less than 50 miles to Jackson McKellar Sipes Airport. It also has rail access.

Camden is a city of approximately 3,500 people with established infrastructure including scheme water, waste-water treatment, high voltage power, sealed roads and skilled labor.

## 15.1 Site Layout

A preliminary integrated site plan including mining operations, wet concentration plant and dry separation plant and ancillary facilities was developed by Primero Group during the study.

## 15.2 Potable Water

Potable water is provided to the plant from the Camden municipal water supply. Potable water supply to the WCP will be trucked approximately 17 miles from Camden and stored in a dedicated potable water tank. Potable water supply to the MSP will be sourced direct from the Camden scheme water supply.

## 15.3 Wastewater Treatment

Wastewater will be treated through the existing Camden Wastewater Treatment Plant (WWTP). Waste from both the WCP and MSP will be stored at each-site then systematically pumped to a waste truck and delivered to the existing WWTP for treatment.

## 15.4 Fire Services

Both the WCP and MSP sites will be protected by a fire water system in accordance with the National Fire Protection Association (NFPA) standards. This system comprises of a dedicated fire water storage tank, electrical and diesel fire water pumps, fire water hose reels, standpipes and sprinkler systems as required.

## 15.5 Natural Gas

Natural gas shall be used as the fuel source for the rotary dryers, and for various heating duties associated with the HVAC systems around the site. Natural gas is supplied from the municipal distribution network.

## 15.6 Roads

Site roads shall be provided for all operations and maintenance activities. Roads shall be asphalt in high traffic areas only.

## 15.7 Diesel

A diesel storage and distribution facilities shall be provided at both the WCP and MSP sites to supply mobile equipment. Diesel shall be supplied by road tanker and each facility will provide sufficient diesel storage, provision for tanker unloading and for refueling of mobile equipment.

## 15.8 Compressed Air

Compressed air will be used at both the WCP and MSP circuits.  The compressed air will be supplied by rotary screw compressors. Each compressed air circuit is complete with air dryers and filters to provide the required air quality, and with air receivers sized to accommodate the maximum instantaneous flow rate required.

## 15.9 Renewable Power

IperionX intends to implement fully renewable power sourcing options for the Titan Project, including the assessment of existing on-grid solutions currently provided by incumbent power generators and suppliers in the area. The WCP and MSP facility will each contain a substation with high voltage switchboard and suitable feeders to supply switch rooms located in different areas of the plant to reduce cable cost and drop voltage. An estimate of the power demand for each area is 11.4 MW at the Mine and WCP facility, and 2.2 MW at the MSP facility.

## 15.10 Communication

There will be separate PLC-RIO, PLC-EOL, PLC-VFD, PLC-PLC, PLC_SCADA and SCADA_SCADA networks serviced by separate communications cards in the PLC processor racks. PLC to Remote PLC IO (RIO) communications will be Ethernet over multimode fiber, copper and / or wireless. Communications within the plant area will be hardwired.

## 15.11 Buildings

Administration buildings located at the WCP and MSP facilities will be provided for all operations and maintenance personnel.  Buildings shall be of prefabricated modular construction. The administration buildings will be plumbed, powered, and contain HVAC as required.

Control rooms will be provided at both the WCP and MSP facilities. The control rooms will be modular, air-conditioned buildings. Maintenance workshop and stores located at both the WCP and MSP facilities will include designated storage and laydown yards.  The workshop will consist of mechanical, boilermaker, electrical and instrument work areas.

A site laboratory at the MSP facility will be provided. The laboratory will be of a prefabricated modular construction and connected to all services.

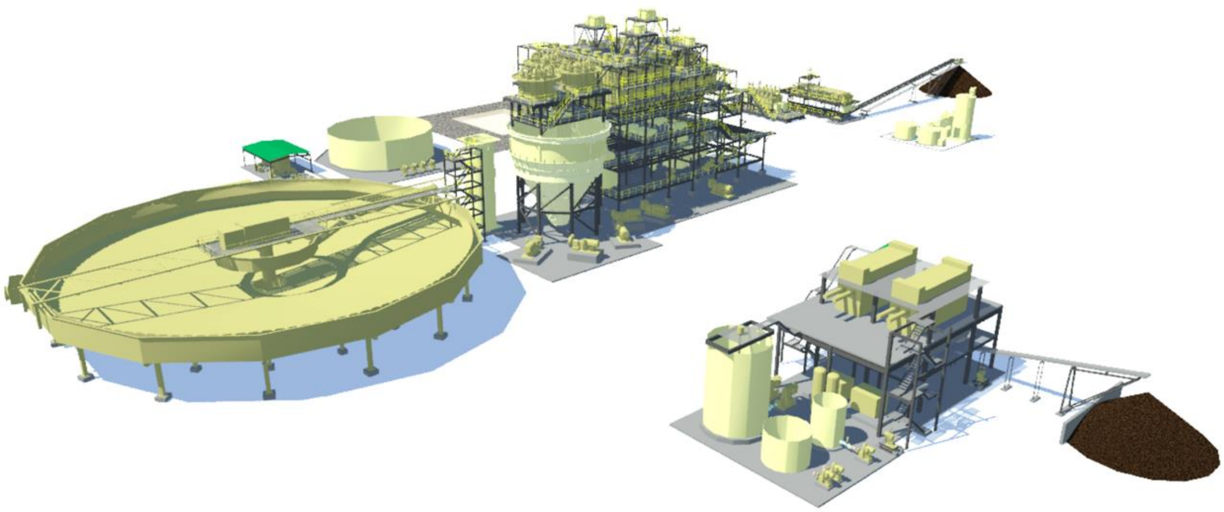

*Figure 29: Titan Project WCP 3D model.*

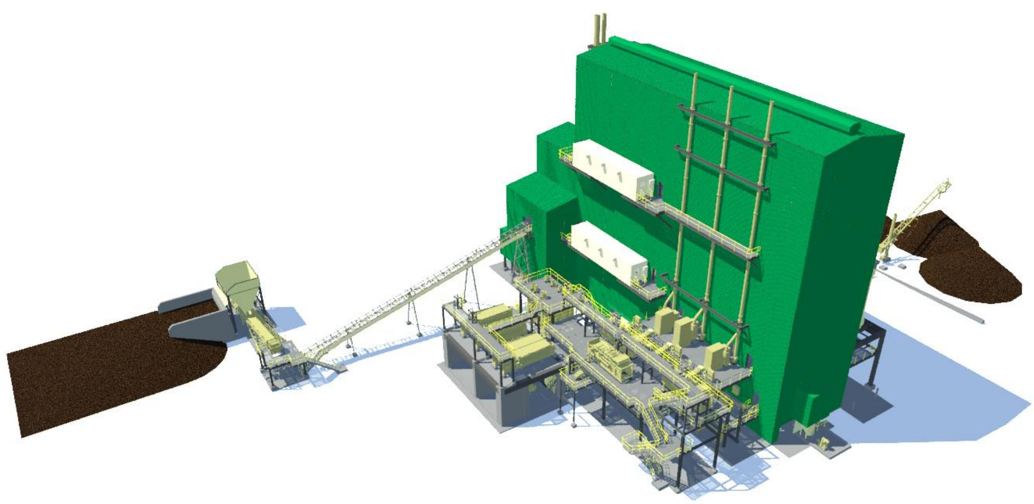

*Figure 30: Titan Project MSP 3D model.*

# 16. Market Studies

## 16.1 Market Fundamentals and Product Sales

### 16.1.1 Critical Minerals Overview

A consistent, secure, and domestically sourced supply of critical minerals has been acknowledged by the U.S. government as one of the most urgent issues to U.S. national security and economic prosperity. Critical minerals are both ubiquitous to current everyday life, and are essential inputs in advanced applications and technologies, particularly those related to decarbonization.

*"Critical minerals provide the building blocks for many modern technologies and are essential to our national security and economic prosperity. These minerals—such as rare earth elements, lithium, and cobalt—can be found in products from computers to household appliances. They are also key inputs in clean energy technologies like batteries, electric vehicles, wind turbines, and solar panels. As the world transitions to a clean energy economy, global demand for these critical minerals is set to skyrocket by 400-600 percent over the next several decades, and, for minerals such as lithium and graphite used in electric vehicle (EV) batteries, demand will increase by even more—as much as 4,000 percent. The U.S. is increasingly dependent on foreign sources for many of the processed versions of these minerals." **– U.S. White House, February 2022**[6]*

The U.S. Energy Act of 2020 defines a "critical mineral" as a non-fuel mineral or mineral material essential to the economic or national security of the U.S. and which has a supply chain vulnerable to disruption. Critical minerals are also characterized as serving an essential function in the manufacturing of a product, the absence of which would have significant consequences for the economy or national security.

In February 2022, the U.S. Geological Survey, an office of the U.S. Department of the Interior, published its final list of minerals considered critical to the U.S.[7], being: aluminum, antimony, arsenic, barite, beryllium, bismuth, cerium, cesium, chromium, cobalt, dysprosium, erbium, europium, fluorspar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lithium, lutetium, magnesium, manganese, neodymium, nickel, niobium, palladium, platinum, praseodymium, rhodium, rubidium, ruthenium, samarium, scandium, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, and zirconium.

Foreign nations, including China and Russia, currently dominate many of these critical mineral and material supply chains, including titanium and rare earth elements. Relying on foreign sources for these critical materials poses a risk to the U.S.'s readiness to deter and defeat adversaries, with important defense applications for these supply chains including rare earth permanent magnets for jet fighter engines, missile guidance systems, antimissile defense, space-based satellites, and communication systems and well as titanium for the structures of fighter jets, bombers, attack aircraft, transports and helicopters.

### 16.1.2 Rare Earth Concentrates

Rare elements earths (rare earths) are a group of 15 elements in the periodic table known as the Lanthanide series, plus Yttrium. Rare earths are categorized into light elements (lanthanum to samarium) and heavy elements (europium to lutetium). Rare earths are used in many industrial applications, including mature industries, typically as additives in a mix of other materials to help products achieve superior performance. Rare earths react with other metallic and non-metallic elements to form compounds which have specific chemical behaviors. This makes them indispensable and non-replaceable in many electronic, optical, magnetic, and catalytic applications.

Rare earths are used in many applications including battery alloys, catalysts, ceramics and metal alloys. However, it is the increasing demand for rare earths used in high strength permanent magnets, specifically neodymium-iron-boron (NdFeB) magnets, found in power dense electric motors used in electric vehicles and wind turbines that makes up the

[6] Fact Sheet: Securing a Made in America Supply Chain for Critical Minerals (link)

[7] 2022 Final List of Critical Minerals (link)

majority of global consumption, accounting for ~90% of the global market by value in 2019 and expected to grow rapidly along with growth in electric vehicle (EV) and wind turbine production.

NdFeB magnets rely on the light rare earths neodymium (Nd) and praseodymium (Pr), with heavy rare earths such as dysprosium (Dy) and terbium (Tb) also used to improve resistance to demagnetization at temperatures above 120 °C. These magnets are key intermediate components of permanent magnet direct drive generators in wind turbines and electric synchronous traction motors for propulsion systems in EVs. Given their importance in key components in the renewable energy electrification supply chain, namely energy generation and energy storage, rare earths are critical to the U.S.'s decarbonization efforts.

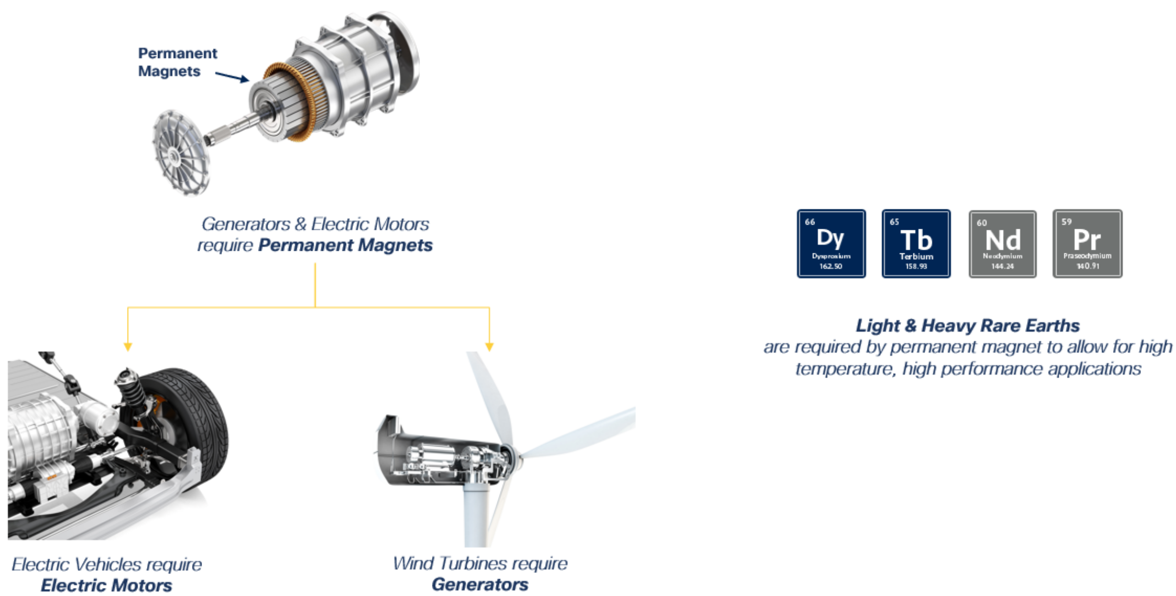


***Figure 31: Major uses of rare earth containing permanent magnets.***

Following a pandemic-induced lull in 2020, Adams Intelligence, an independent research and advisory consultant focused on strategic metals and minerals, data indicates that consumption of NdFeB magnets increased by 18.1% in 2021, with forecast demand to increase at a CAGR of 8.6% from 2022 through 2035 leading to a significant supply deficit throughout this period.

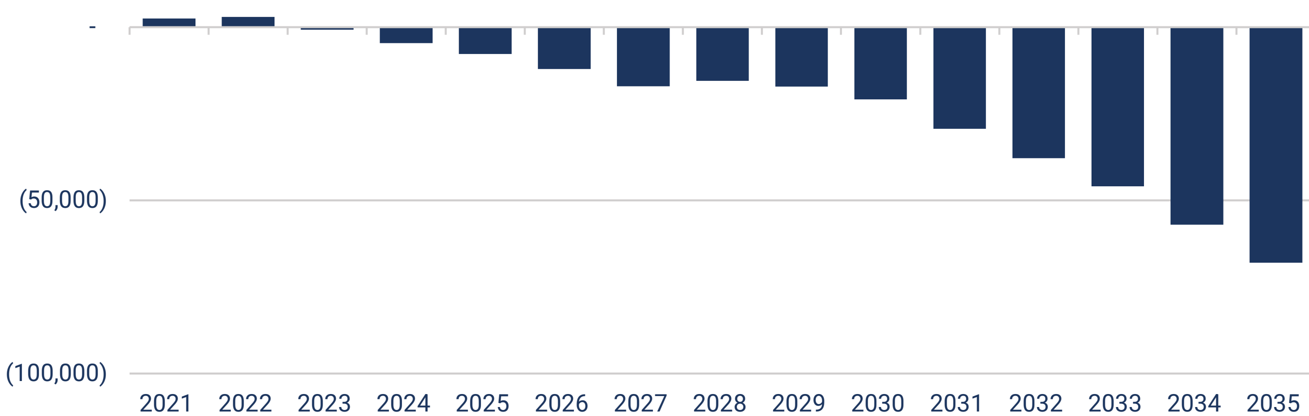


***Figure 32: Global NdPr supply / demand imbalance (Nd/Pr oxide tons)[8].***

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[8] Source: Pensana PLC, June 2022 (link)

Further, rare earths, particularly the heavy rare earths dysprosium and terbium, are essential for U.S. defense applications, primarily in targeting and weapons systems, including smart bombs and missiles, as well as for their use in compact and powerful electric motors in air, sea and subsea weapons platforms.

There is only minor production of dysprosium and terbium outside of China, and no material production within the U.S. The potential production of these heavy rare earths within the U.S. is strategic and highly valuable to the country's leading defense, EV and clean energy sectors. In September 2021 the Commerce Department's Bureau of Industry and Security initiated an investigation under section 232 of the Trade Expansion Act of 1962, to determine the effects on U.S. national security from imports of NdFeB permanent magnets.

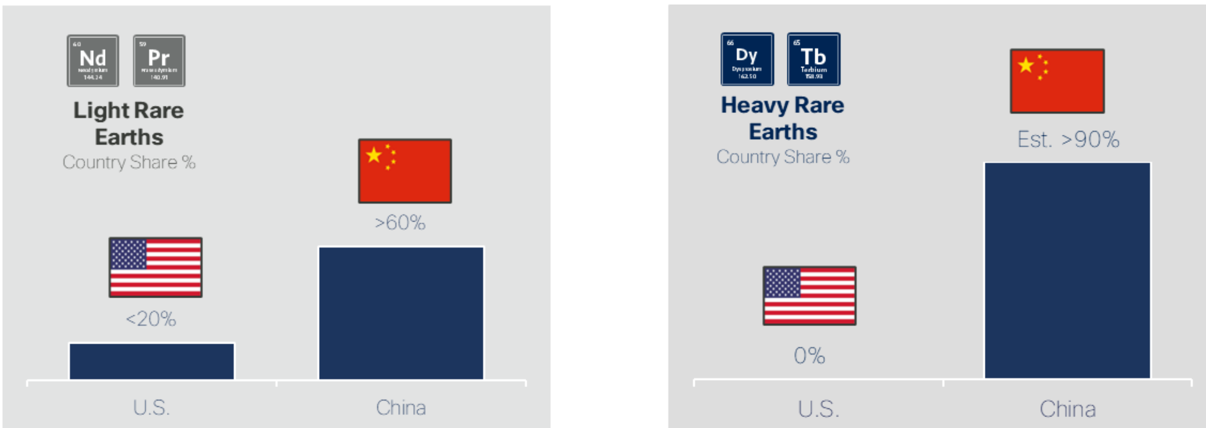



*Figure 33: Rare earth production attributable to China and the U.S.*

There is only minor production of dysprosium and terbium outside of China, and no material production within the U.S., and the potential production of these heavy rare earths at the Titan Project is strategic and highly valuable to the country's leading defense, EV and clean energy sectors.

Test work to date has highlighted that the rare earth minerals at the Titan Project contain a high percentage of rare earth oxides, with significant proportions of the highly valuable heavy rare earths terbium and dysprosium as well as the valuable light rare earths neodymium and praseodymium identified within IperionX's monazite and xenotime mineral concentrates.

*Table 19: Titan Project rare earth concentrate profile, highlighting enrichment of heavy rare earths.*

| (%) | Typical Monazite Concentrate | IperionX REE Concentrate |
|---|---|---|
| TREO | 53 – 55 | 58 – 59 |
| Monazite / Xenotime | - | 80 / 10 |
| LREO (% TREO) | 90.7 | 79.5 |
| HREO (% TREO) | 9.3 | 20.5 |
| NdPr Oxides (%TREO) | 22.0 | 21.2 |
| DyTb Oxides (%TREO) | 0.9 | 2.4 |

In April 2021, IperionX and Energy Fuels signed a Memorandum of Understanding for the supply of monazite sands from IperionX's Titan Project in Tennessee to Energy Fuels' White Mesa Mill in Utah. Energy Fuels and IperionX are continuing to evaluate expanding their collaboration to establish a fully integrated permanent rare earth magnet supply chain in the U.S.

In March 2022, Energy Fuels undertook laboratory evaluation of rare earth mineral concentrates from IperionX's Titan Project in west Tennessee. Energy Fuels' evaluation indicates that IperionX's rare earth minerals are suitable as a high quality feedstock to produce a high purity mixed rare earth carbonate at Energy Fuels' White Mesa Mill in Utah. Energy

Fuels is currently producing a mixed rare earth carbonate at commercial scale at its mill. This commercial product is the most advanced rare earth material being produced in the U.S. today at scale.

Energy Fuels also intends to construct solvent extraction rare earth separation infrastructure at its mill in the coming years, allowing the facility to produce separated rare earth oxides from high quality feedstocks like the rare earth concentrate expected to be produced from IperionX's Titan Project.

### 16.1.3 Titanium Products

Titanium is the key input into the global paints and pigment industry, while titanium metal is desired by industry for its light weight, high strength to weight ratio, stiffness, fatigue strength and fracture toughness, excellent corrosion resistance, and the retention of mechanical properties at elevated temperatures. Titanium and titanium alloys are used in diverse areas such as aerospace, defense, automotive components, chemical processing equipment and medical implants. However, a barrier for the widespread use of titanium is the cost associated with manufacturing a finished part, with approximately half of the cost historically associated with fabrication.

The U.S. market is one of the largest and highest value titanium markets globally due to the significant use of titanium in the high-performance space, aerospace and defense sectors.

In the report delivered in June 2021 by the U.S. Department of Commerce Bureau of Industry and Security, *The Effect Of Imports Of Titanium Sponge On The National Security*, it was noted that Congress has recognized that titanium sponge is critical to national security by including titanium as a strategic material in the Specialty Metals Clause, with all titanium used in national defense systems directed to be melted or produced in the United States or a qualifying country.

Further, the Department of the Interior's 2018 List of Critical Minerals established titanium as essential to U.S. security, and found that the absence of a titanium sponge supply would have significant consequences for the U.S. economy and the national security.

The U.S. was the first nation to commercialize titanium sponge production in the 1950s. In 1984, there were five plants producing titanium sponge in the U.S. but by 2019, only one producer was capable of producing titanium sponge for defense, commercial, and industrial purposes. That final production facility closed in 2020 and now the U.S. has no commercial titanium sponge production capacity and is 99.9% import reliant to produce semi-finished and final products.

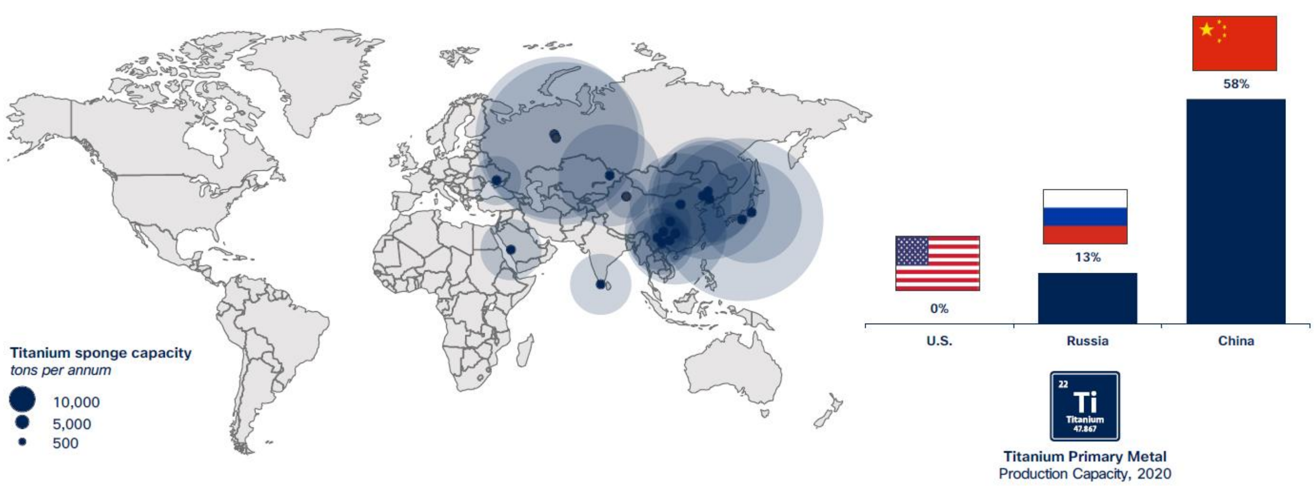



***Figure 34: Global titanium sponge production capacity[9].***

[9] Source: USGS

The U.S. now has minimal commercial titanium sponge production capacity, which is a critical material for many U.S. defense systems, including fighter jets, bombers, attack aircraft, transports and helicopters, with newer aircraft using increased amounts of titanium. Titanium is frequently deployed in applications which require high strength and low weight, such as the A-10 Thunderbolt II attack aircraft, where a titanium cockpit tub has proved vital to the safe return of pilots despite heavy damage from enemy ground fire.

***Table 20: Titanium content in select U.S. military airframes.***

| Airframe | Introduction into Service | % of Titanium Content |
|---|---|---|
| CH-47 Chinook | 1962 | 8 |
| F-15 Eagle | 1976 | 10 |
| F-16 Fighting Falcon | 1978 | 7 |
| F/A-18 Hornet | 1984 | 12 |
| F-22 Raptor | 2005 | 39 |
| V-22 Osprey | 2007 | 31 |
| F-35 Lightning II | 2015 | 20 |
| Military airframes entering service after 2000 have an average 30 percent titanium content; airframes entering service prior to 2000 had an average of just 9 percent. | | |
| Source: Arconic Engineered Structures, "World Titanium Trends in Defense", Presentation at the Titanium USA conference, September 24, 2019 | | |

Titanium is also extensively used in naval applications due to is excellent anti-corrosion characteristics, as well as army ground vehicles and hypersonic missile programs due to its very high strength and light weight.

Currently only Japan, Russia, and Kazakhstan have titanium sponge plants certified to produce aerospace rotating-quality sponge that can be used for aerospace engine parts and other sensitive aerospace applications. In 2018, Russian and Chinese titanium sponge producers controlled 61% of the world's titanium sponge production, an increase on their combined 55% share in 2008 and 37% share in 1998. In 2021, Russia and China's control of global titanium sponge production is likely to increase to over 70%

Absent domestic titanium sponge production capacity, the U.S. is completely dependent on imports of titanium sponge and scrap, and lacks the surge capacity required to support defense and critical infrastructure needs in an extended national emergency.

Given the lack of domestic production capacity, and that the U.S. no longer maintains titanium sponge in the National Defense Stockpile, titanium producers, including producers of goods such as ingot, billet, sheet, coil, and tube, are almost all entirely dependent on non-U.S. sources of titanium. This presents the possibility that in a national emergency, U.S. titanium producers would be denied access to imports of titanium sponge and scrap due to supply disruption.

Titanium minerals found at the Titan Project are dominated by rutile and highly altered ilmenite, which are feedstocks for a variety of uses including for titanium dioxide, titanium metal and other applications including welding and nanomaterials. Natural rutile is a high-grade titanium dioxide feedstock (typical $TiO_2$ content of 92-95%), which commands a significant price premium in the titanium dioxide market. Ilmenite is also a titanium dioxide feedstock (typical $TiO_2$ content of 58-62%), which can be sold directly to pigment producers or can be used as a feedstock for synthetic rutile production.

Test work to date indicates that ilmenite mineral found at the Titan Project is likely to be suitable for the chloride ilmenite market, with a $TiO_2$ content greater than 58%. Additionally, the rutile product has the potential to be a high-grade feedstock, with a $TiO_2$ content of between 93% and 97%.

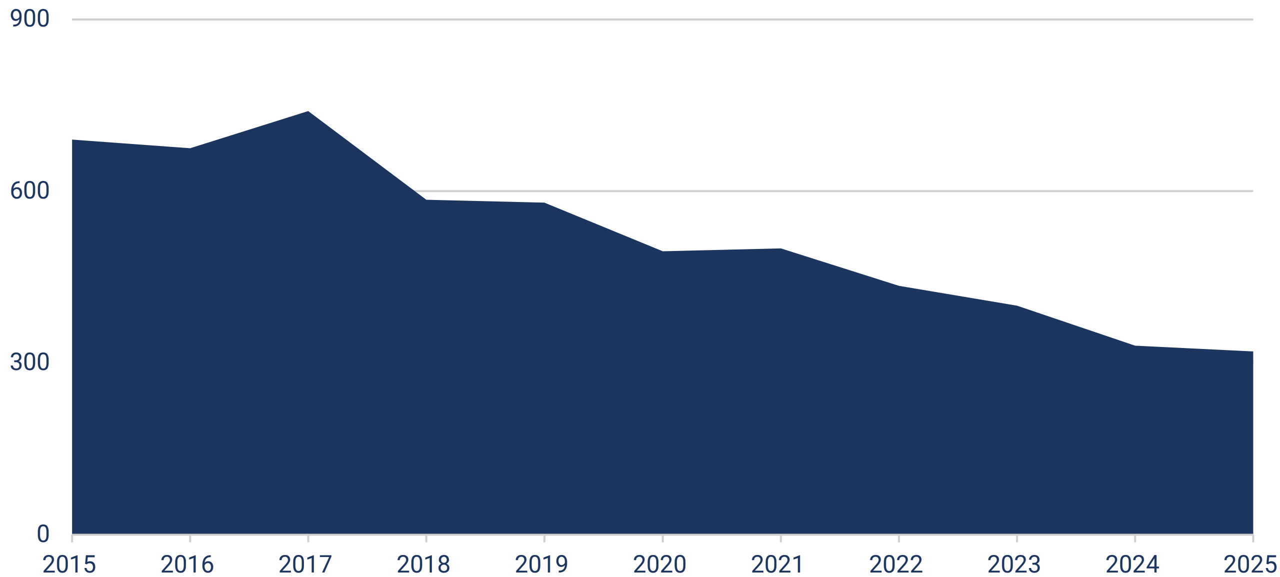



***Figure 35: Global rutile supply outlook (kt)[10].***

In December 2021, the company entered into a Memorandum of Understanding with The Chemours Company (Chemours) for the supply of the titanium feedstocks ilmenite and rutile from IperionX's Titan Project in west Tennessee to Chemours. Chemours is one of the world's largest producers of high quality titanium dioxide products for coatings, plastics, and laminates, with a nameplate titanium dioxide capacity of 1,250,000 tons globally, including New Johnsonville, Tennessee, located 20 miles from IperionX's Titan Project, and DeLisle, Mississippi, located 1,100 miles by back haul barge on the Mississippi River.

The MoU contemplates the commencement of negotiations of a supply agreement between IperionX and Chemours for an initial five year term on an agreed market based pricing methodology for the annual supply of up to 50,000 tons of ilmenite and 10,000 tons of rutile, which is equivalent to approximately 50% of total ilmenite production and approximately 60% of total rutile production over the first 5 years of operations at the Titan Project.

### 16.1.4 Zircon Products

Zircon is an opaque, hard mineral widely used in the production of ceramics, where it provides whiteness, strength and corrosion resistance, including in tiles, sinks, sanitary ware and tableware. Refractory linings and foundry castings also utilize zircon in their manufacturing to provide chemical and corrosion resistance. Zircon can also be used as a feedstock for production of zirconium metal, used in many advanced industries including clean energy, health and aerospace, with two zirconium metal producers currently operating in the U.S.

Test work to date indicates that zircon mineral found at the Titan Project is likely to be suitable for the premium zircon market, with a $ZrO_2$+$HfO_2$ content greater than 65%, with the potential to be sold into the domestic U.S. zircon premium market.

The global supply of zircon is forecast to decline due to mine depletions, with new projects required to meet predicted demand. There is no meaningful new capacity forecast in the near term, and market conditions remain extremely tight.

[10] Source: Iluka Resources, February 2022 (link)

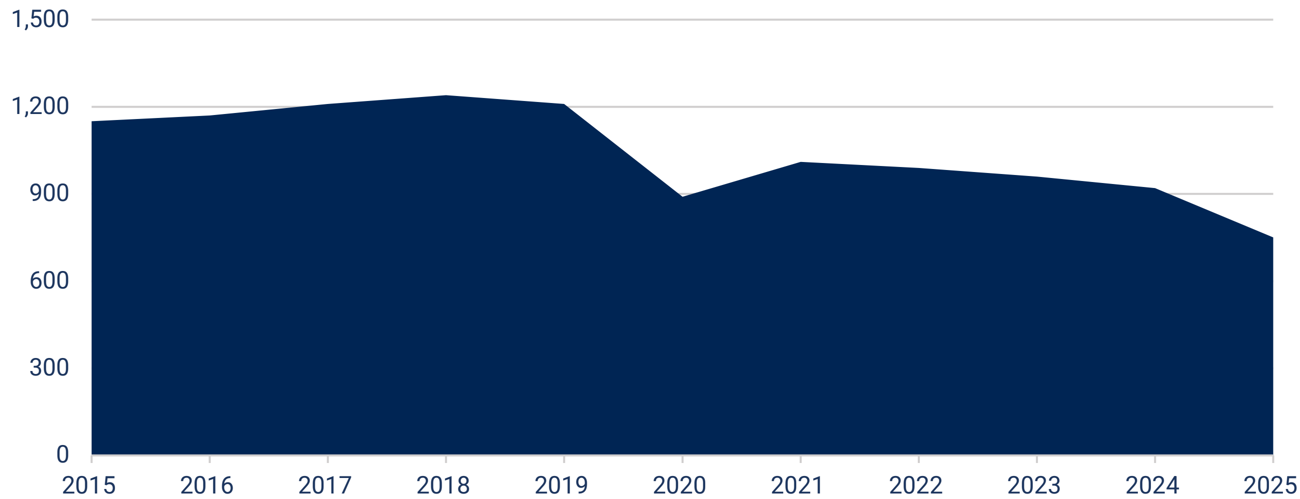



*Figure 36: Global zircon supply outlook (kt)[11].*

In February 2022, the company entered into a Memorandum of Understanding with Mario Pilato BLAT S.A. (Mario Pilato) for the potential supply of zircon products. Mario Pilato is a leading international supplier of raw materials for ceramics, glass and refractories, headquartered in Valencia, Spain The MoU contemplates the commencement of negotiations of a supply agreement between IperionX and Mario Pilato for an initial five year term on an agreed market based pricing methodology for the annual supply of up to 20,000 tons of zircon products from the Titan Project, which is equivalent to approximately 50% of total zircon production over the first 5 years of operations at the Titan Project.

## 16.2 Price Forecasts

The Company engaged Adamas Intelligence, an independent research and advisory consultant focused on strategic metals and minerals, to provide a pricing methodology and price forecast for rare earth concentrates produced at the Titan Project. The pricing methodology is based upon Adamas' forecast pricing of IperionX's rare earth concentrates with reference to the value of rare earth oxides contained, with a premium applied by Adamas for the specific rare earth oxide enrichment, including heavy rare earths, contained within the Titan Project product.

The Company utilized commodity pricing based upon forecasts from TZMI for ilmenite, rutile and zircon products, adjusted for economic factors. TZMI is a global independent consulting and publishing company which specializes in all aspects of the mineral sands, titanium dioxide and coatings industries, particularly the titanium and zirconium value chains. Zircon concentrate pricing forecasts have been assessed by the Company as receiving a 55% discount to the price of premium zircon, a standard industry benchmark discount.

*Table 21: Scoping Study product price forecasts (US$/t, 2022 real terms, rounded).*

| Product | Spot pricing[12] | 2023 – 2027 (annual average, US$/t) | 2028+ (annual average, US$/t) |
|---|---|---|---|
| Rare earth concentrate | $11,180 – $12,850 | $14,325 | $17,690 |
| Rutile | $1,960 – $2,280 | $1,475 | $1,285 |
| Chloride Ilmenite | $390 – $470 | $305 | $310 |
| Zircon (premium) | $2,500 – $3,025 | $2,240 | $1,685 |
| Zircon (concentrate) | $945 – $1,330 | $1,010 | $760 |

11 Source: Iluka Resources, February 2022 (link)
12 Source: ruidow.com at June 29, 2022, Iluka Resources

# 17. Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

## 17.1 Environmental Studies

### 17.1.1 Critical Issues Analysis

IperionX has engaged HDR to support permitting activities on the proposed Project. In 2020, HDR conducted a desktop review of topographic and aerial photograph base maps for the Project area utilizing publicly available Geographic Information System (GIS) and interactive web-based mapping applications.

HDR utilized available data for Benton, Carroll and Henry Counties, TN to assess potential environmental conditions.

Following mapping and the initial environmental assessment, HDR completed a regulatory review and permit evaluation of the proposed Project as it relates to the following federal, state, and local environmental regulations:

- Clean Water Act (Sections 404 and 401);
- National Pollutant Discharge Elimination System (NPDES) for Storm Water Discharges associated with Construction;
- Section 10 (Rivers and Harbors Act);
- Federal and State Threatened & Endangered Species;
- Section 106 Historic Preservation Act;
- Public Lands Permitting;
- State and Local Floodplain;
- State and Local Construction Dewatering;
- Local Soil Erosion and Sedimentation Control requirements;
- State Mining Permit; and,
- Other applicable state and local environmental requirements.

### 17.1.2 USACE Wetland Delineation and TDEC Hydrologic Determination Field Work

In 2021, HDR conducted a stream/wetland delineation, threatened and endangered species habitat survey, cultural resources review, and continue to support a groundwater quality and quantity testing program.

HDR conducted field visits in May and June 2021 to document United States Army Corps of Engineers (USACE)-regulated jurisdictional Waters of the U.S. and TDEC-regulated waters of the state within the site.

### 17.1.3 Federally and State Threatened and Endangered Habitat Survey

HDR identified federal and state listed species habitat likely to occur on or in the vicinity of the site. HDR requested an Environmental Review through TDEC Natural Heritage Program (NHP) which provided site-specific data of known state and federal concern plant and animal species, ecologically significant sites, and certain conservation managed lands. Concurrent with Task 2, HDR conducted a pedestrian survey of the site to verify the presence or absence of potential habitat for federally threatened and endangered species that may occur on the site. A brief memo to IperionX was prepared detailing the results of the federal and state threatened and endangered (T&E) species habitat survey results. The memo was delivered to IperionX on July 1, 2021.

### 17.1.4 Cultural Resources Background Research

HDR conducted a National Historic Preservation Act (NHPA) cultural resources background investigation for the approximately 2,432-acre Titan Project in Carroll and Henry counties, Tennessee in April 2021. The purpose of the investigation was to identify known historic (National Register of Historic Places (NRHP)-eligible) properties in the Project Area and surrounding one-mile radius and make recommendations on further NHPA cultural resources work for the Project.

The research included results from the Tennessee Division of Archaeology (TDOA), the Tennessee Historical Commission (THC), the NRHP GIS database, and the Tennessee Cemetery Database (TNGenWeb). HDR synthesized the research results and authored a report summarizing the findings of the background investigation completed for the Titan Project and associated recommendations that was delivered to IperionX on June 30, 2021.

HDR identified six previously recorded archaeological sites and five cemeteries within one mile of the Project Area. None of these known resources are located in the Project Area.

### 17.1.5 Groundwater Quality and Quantity Testing Program

HDR proposed to support IperionX with an evaluation of groundwater conditions within the Study area through 1) completion of an aquifer pumping test and 2) groundwater level monitoring and groundwater quality testing. Both tasks required installation of monitoring wells.

In Q2 2021, HDR provided oversight for the installation of monitoring and aquifer test wells; conducted a 72-hour aquifer pumping test; and conducted the first of six planned bi-monthly groundwater sampling events. The purpose of the well installation and testing is to provide a baseline understanding of aquifer properties, groundwater position, and ground water quality as they pertain to development of the Site as a mineral sand mine.

HDR will continue to collect baseline groundwater and surface water quality data on a bi-monthly basis for a period of one year. In 2022, HDR will provide a memo summarizing findings to include boring logs, sample location map, potentiometric surface maps (per sampling event), aquifer test results, stream flow measurements, and laboratory data for groundwater and surface water samples.

## 17.2 ESG Assessment and Integration

In May 2021, IperionX commenced an ESG (environmental, social, and governance responsibility) assessment and integration process, toward its development plan to produce low-to-zero carbon titanium in the U.S. The company commissioned PGS Consults to conduct the following activities: materiality assessment, life cycle assessment, ESG-leadership playbook, and an environmental health and safety (EHS) management system gap assessment.

### 17.2.1 ESG Materiality Assessment

During the summer of 2021, PGS Consults was pleased to interview 59 individual identified stakeholders representing over 30 companies and organizations. The purpose of the interviews was to assess what Environmental, Social, and Governance factors were most material for IperionX based on their stakeholder's feedback. All interviews were anonymous, and all information gathered was aggregated, except for the final question where interviewees were invited to share their thoughts associated with their name.

Of the respondents, 5 are IperionX executives and board members, 5 are IperionX management, and 49 work for other organizations or are representing themselves as residents near IperionX's Tennessee location and represented a variety of stakeholder categories.

### 17.2.2 ESG Factors Most Material to IperionX

Based on the ratings collected during the stakeholder interviews, PGS Consults plotted the potential material factors, as shown below. The material factors were scored by IperionX's stakeholders from 1 (least important) to 3 (most important) and were graphed with the internal stakeholder's scoring on the "X" axis and the external stakeholder's scoring on the "Y" axis. As can be seen by the range of the graph below, IperionX's stakeholders scored most of the material factors highly. The most important material factors appear in the darker blue areas of the graph (top and right portions), the medium ranked factors are in the medium blue (middle) portion of the graph.

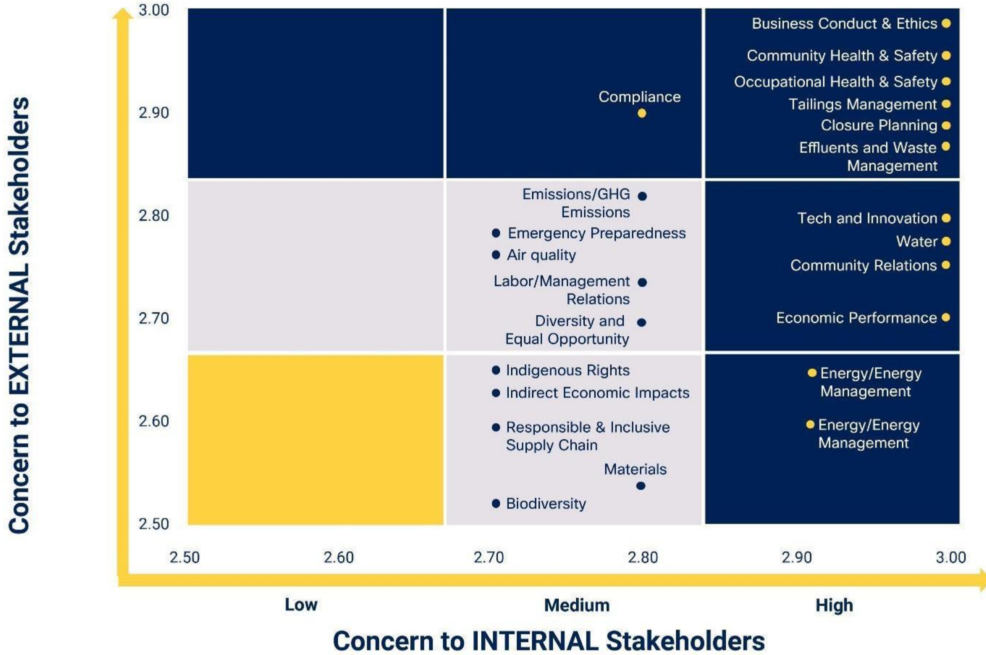



*Figure 37: IperionX materiality index.*

From the materiality matrix above, PGS Consults identified five ESG focus areas for IperionX:

- ESG Focus Area 1 – Business Conduct & Ethics and Regulatory Compliance.
- ESG Focus Area 2 – Health & Safety – Community & Employees.
- ESG Focus Area 3 – End-State Vision: Tailings Management & Closure Planning.
- ESG Focus Area 4 – Community & Labor Relations: Employment & Diversity/Equity/Inclusion.
- ESG Focus Area 5 – Environmental Management: GHG Emissions, Air quality, water, energy, waste, biodiversity.

### 17.2.3 Life Cycle Assessment

Following the materiality assignment, PGS Consults began a life cycle assessment (LCA) of one of IperionX's metals processes at their Utah facilities. The Granulation, Sintering, Deoxygenation (GSD) converts scrap titanium metal to pure spherical titanium powder for the additive manufacturing industry. The LCA will help IperionX to continue to decarbonize their processes and compare the impacts of their process to more conventional titanium processes.

### 17.2.4 ESG Playbook

PGS Consults next prepared a "playbook" for IperionX's ESG leadership and attainment of preliminary sustainability goals, tied to the five focus areas identified during the Materiality Assessment. Concurrently, the consultants are forecasting the cost, impacts, and return on investment (ROI) and other business benefits of IperionX's key ESG goals.

### 17.2.5 EHS Management System

As part of their commitment to the health and safety of their employees and the environment in which they operate, IperionX commissioned PGS Consults to conduct a Gap Assessment of IperionX's Tennessee and Utah operations against the global standards of ISO 45001 (occupational health and safety management systems) and ISO 14001 (environmental management systems). This EHS Management System Gap Assessment was completed in the fourth quarter of 2021 and identified key improvement areas for IperionX. Next PGS Consults prepared an Implementation Plan to support IperionX in setting up a world class EHS Management system to ensure compliance and leading environmental and occupational health and safety management in all their operations.

### 17.2.6 ESG – Next Steps

During the first quarter of 2022, PGS Consults initiated work on IperionX's carbon footprint baseline to quantify their carbon footprint for fiscal years 2021 and 2022, to support their company-wide low-to-zero carbon goal. Additionally, work has commenced to prepare the first Annual Sustainability Report for IperionX, targeting a third quarter 2022 publication. This report will further summarize all the ESG achievements and ongoing work towards IperionX's ESG goals.

## 17.3 Community Engagement

The groundwork has been laid regarding the community engagement initiative, and we are very proud of those results thus far. Clearly, community relationships and engagement has made a positive impact on the corporate image and brand reputation. We have built honest trusting relationships within the community as well as within the state. At IperionX, we are extremely dedicated to building these trusting and sustainable relationships. Being successful in a community means creating long-term opportunity, managing environmental impacts and caring about the communities, their health and safety. The support of the communities, local and state governments is necessary in setting the standards that will make lasting, generational differences between industries and the communities. We have been very fortunate to have the full support of the communities, and the government in our areas, and we know the value of that union and trust.

IperionX will continue to foster these community relationships. Collectively we work with the communities, organizations, and stakeholders in a structured way. This allows IperionX to continue to build trust, broaden support, improve knowledge, promote participation, and involvement. All of these conditions together have certainly produced extraordinary results. The outcome has been allies, advocates and outside voices that actively validate and support IperionX. This has allowed us to improve our visibility and awareness, increase collaboration, communication and engagement with community members, stakeholders, and key partners. We are able to share resources and exchange ideas, and provide trust and accurate understanding of IperionX's ultimate values, mission and vision.

Some examples of those people and organizations who we continue to engage with include (but not limited to) TDEC, TVA, TN state government officials, community members, business owners, local government officials, local school systems, universities, tech schools, local and state government groups IperionX will continue identifying and engaging with new groups and stakeholders. IperionX's vision is to create a legacy of operational excellence by maintaining positive and sustainable industry standards, credible communications, and shared beneficial opportunities, including a focus on local employment. We continue to operate a transparent and open door standard.


*Figure 38: Community engagement activities.*

## 17.4 Partnership with University of Tennessee's Institute of Agriculture (UTIA)

IperionX is partnering with the University of Tennessee Institute of Agriculture to research the implementation of sustainable operating and rehabilitation practices at the Titan Project in West Tennessee. The University of Tennessee is the flagship university in the state of Tennessee, and UTIA is at the forefront of agribusiness research, education and community outreach. The Titan Project includes programs focused on post mineral extraction practices and carbon sequestration opportunities for generational land-use benefits for local landowners.

The initial scope of work will focus upon the elimination of invasive vegetation and subsequent improved ecological revegetation utilizing native warm season grasses, undertaken on IperionX's owned properties. IperionX will establish a 10-acre demonstration site at the Titan Project for UTIA's use for the initial scope of work, with the potential for the site to be used for further sustainability investigations, including the use of biochars, gypsum and other soil amendments to aid in higher crop yields and the carbon sequestration

### 17.4.1 Native Warm Season Grasses

Native Warm Season Grasses (NWSGs) are a variety of tall-growing bunch grasses that grow during the warmer months of the year and lay dormant in the autumn and winter. Native grasslands are among the most endangered ecosystems in the Mid-South of the U.S., resulting in habitat destruction for native fauna including quail, rabbits and grassland songbirds, who use native grasslands for cover and nesting.

NWSGs are known for their fast-growing, deep root systems, which retain soil and help prevent erosion, along with their high-quality forage and hay production once mature. These deeper root systems help NWSGs sequester more carbon than their non-native counterparts. Research has shown that NWSGs grow better and have better yields than non-native grasses commonly used at reclaimed mineral extraction operations in North America. UTIA and IperionX will investigate the usage of Big Bluestem, Little Bluestem, and Indian Grass at the Titan Project to help remediate post-mining areas and return the land to its natural state with strong ecosystems, and potentially provide meaningfully higher production capacity than pre-mining. Figure 39 shows the difference between NWSGs root depth and non-native grasses.

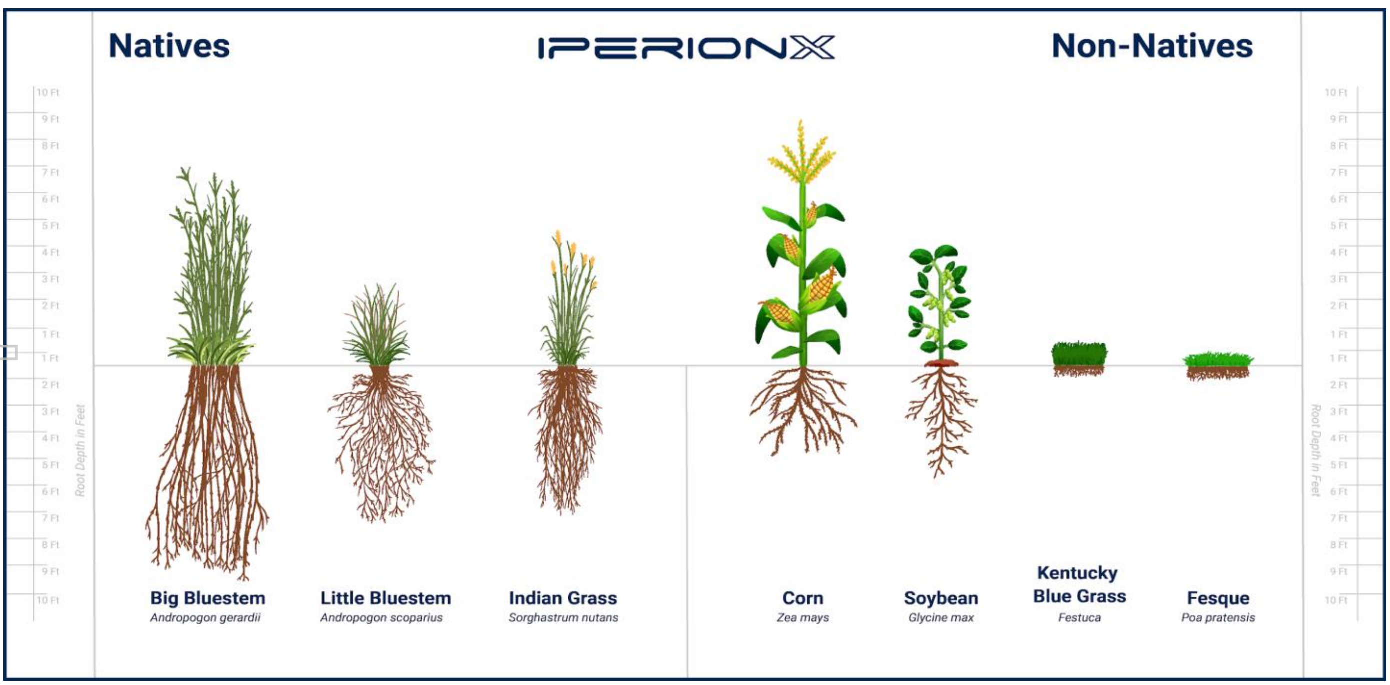



***Figure 39: Native grass root growth vs. non-native.***

### 17.4.2 Biochar and Gypsum Soil Amendments

Biochar is a charcoal-like material made from grasses, wood and other plant materials, that is produced via the thermochemical decomposition of biomass at high temperature in low oxygen environments. Biochar is added to soil mixtures to improve the productivity and resilience of agricultural systems by increasing water retention and increasing plant nutrient availability.

Gypsum, also known as calcium sulfate, is one of the earliest forms of fertilizer with 250 years of agricultural use. Gypsum's primary applications include high-sodium soil remediation, breaking up compact soils like clays, and providing calcium and sulfate sulfur nutrients to plants. Furthermore, it neutralizes aluminum toxicity in soils and improves drainage, reducing phosphorous runoff, crusting and ponding. Recent research has focused on using gypsum soil additives as a potential means of carbon sequestering in soils by enhancing root growth, which UTIA and IperionX will investigate at the Titan Project.

### 17.4.3 Carbon Sequestrating

Carbon sequestration is the removal and storage of carbon from the atmosphere, including by plants in the form of undecomposed organic material, primarily as dead plant root material. As such, plants with fast-growing, deep root systems, including Native Warm Season Grasses, may provide a significant opportunity for carbon sequestration under the right conditions, as does the use of soil additives which promote organic growth, including gypsum.

## 17.5 Waste Disposal and Closure Planning

Five waste and tailings types are generated at the Project, being:

- Dry waste from the overburden waste and inter-burden waste.
- Plus 250mm reject trash at MMU feed hopper grizzly.
- Plus 2mm oversize material reject from the feed preparation trommel generated from the ROM feed.
- Wet waste from the return of the sand tailing from the WCP generated from the ROM feed.
- Dewatered slimes from the WCP generated from the ROM feed.

Dry waste is managed as by dry mining methods, with wet waste sand from the WCP returned via pipeline to the mine workings where it is discharged by a cyclone cluster that dumps retrieved water from the waste stream, dumping high solid content sands into a cone. This sand will then be moved be spread by the Swamp D7 dozers, with the dewatered slimes from WCP being returned to the mining void by trucks prior to being covered by the dry overburden and interburden.

The mineralized material oversize reject material that is pulled from the mineralized material stream from the in-pit mining unit at the trommel is planned to be stockpiled for use in road works. It is likely that this material will be only onsite source of hard material that can be used to improve road conditions. While it is treated as an operating cost, this material also is valuable to the operations and the amount recovered could offset additional costs to import road building material from off-site.

A detailed waste and tailings disposal as well as the site water management plan will be developed in the next phase of the study.

Initial mine closure planning has been undertaken with temporary stockpiles for waste and topsoil to be replaced during the final mine void closure. To limit costs at mine closure, consideration during future mine scheduling will be given to where waste and topsoil is stockpiled from the initial mining void.

An allowance of mine closure cost of 10.25 US$ Million is estimated as part of the initial assessment. A detailed mine closure and rehabilitation plan will be developed in accordance with the regulations.

IperionX is partnering with the University of Tennessee Institute of Agriculture to research the implementation of sustainable operating and rehabilitation practices at the Titan Project in West Tennessee. The University of Tennessee is the flagship university in the state of Tennessee, and UTIA is at the forefront of agribusiness research, education and community outreach. The Titan Project includes programs focused on post mineral extraction practices and carbon sequestration opportunities for generational land-use benefits for local landowners.

IperionX is committed to prioritize local procurement and hiring during the Project development, execution, and operations.

# 18. Capital and Operating Costs

## 18.1 Capital Cost Estimate

Capital Estimates for the mine and process plant have been prepared by Primero Group using a combination of cost estimates from suppliers, historical data, reference to recent comparable projects. Costs are presented in US$ for Q2 2022 and are exclusive of escalation. The intended accuracy of the initial capital cost estimate for the Project is ± 35%.

The cost estimate basis along with the exchange rates used for the Project CAPEX is 0.73 USD/AUD.

The capital cost estimate was developed in two parts:

- Direct costs for the mine pre-production, wet concentrate plant (WCP), mineral separation plant (MSP), common services including reagents and air/water services and non-process infrastructure.
- Indirect costs were estimated for engineering, construction, and owner's costs.

For the mine, the CAPEX estimation is based on the following aspects: clearing & grubbing, mine development, pumping & infrastructure, mobile mining equipment, and mining contractor mobilization.

For the WCP and MSP facilities, the process design criteria, flowsheets and mass balance calculations were produced with sufficient detail to allow for the preparation of a mechanical equipment list. Equipment pricing was collected from benchmark information. The Project used as a benchmark is a similar circuit producing both WCP and MSP products. The Project is currently under construction in Australia, being managed by Primero. The overall supply cost of mechanical equipment was then used to factor all other direct discipline costs such as concrete, steelwork, platework, piping, electrical, and instrumentation and control. These factors were also derived from the benchmarked Project.

In-direct costs, including EPCM, off-site management, capital spares, flights and accommodation, first fills and commissioning costs were also factored from the Project direct costs.

Project contingency was calculated as a factor of the total direct and in-direct costs.

For the non-process infrastructure (NPI), allowances were made for some costs not related to the mechanical equipment supply including process buildings and non-process infrastructure.

Table 22 highlights the total estimated capital expenditures for the Project.

*Table 22: Titan Project capital cost estimate summary.*

| Capital Cost Estimate Breakdown | US$ Million |
|---|---|
| Mine and Wet Concentration Plant | 94.6 |
| Mineral Separation Plant | 22.3 |
| Common Services | 12.5 |
| Project Indirects | 35.2 |
| Mobile Mining Units Turnkey | 23.3 |
| Contingency (30%) | 49.4 |
| **Total Initial Capital** | **237.2** |
| Deferred and sustaining capital | 198.5 |

## 18.2 Operating Cost Estimate

The operating cost estimate was prepared based on operating at annual average of 9.7 million t/y run-of-mine mineralized resource for a mine life of 25 years. Table 23 summarizes the estimated operating costs at steady state.

The operating cost estimate has been performed for the mining, tailings deslime, wet concentrator plant (WCP) that produces HMC and mineral separation plant (MSP). General and administration has been treated separately.

The following non-exhaustive list of cost centers have been used for the estimation: Salaries; G&A; reagents; consumables; utilities (electricity, fuel, water, etc.); and maintenance.

The processing plant operating cost estimate is based on a ±35% level of accuracy, utilizing indicative quotations where possible, and otherwise Primero database estimates and recent experience in the industry.

The OPEX is presented in USD and is current for Q1 2022.

***Table 23: Titan Project operating cost estimate summary.***

| Operating Cost Estimate Breakdown | Average Annual Cost (US$ Million/y) | US$/t ROM |
|---|---|---|
| Mining | 25.8 | 2.66 |
| Processing | 28.2 | 2.91 |
| Transport | 2.1 | 0.22 |
| General & Admin | 6.9 | 0.71 |
| Royalties | 4.0 | 0.41 |
| **Total Operating Costs** | **67.1** | **6.91** |

# 19. Economic Analysis

A detailed financial model and discounted yearly cash flow (DCF) has been developed to complete the economic assessment of the Project and is based on current (Q1 2022) price projections and cost estimates in U.S. dollars. No provision was made for the effects of future inflation, but cost estimates incorporate recent 2021 inflationary price increases. The evaluation was carried out on a 100%-equity basis using an 8% discount factor. Current US federal and Tennessee state tax regulations were applied to assess the corporate tax liabilities.

The total mine life utilized in the model is 25 years scheduled yearly with the first 14 years of the mine life classified as 100% indicated. The WCP & MSP commence operations at the same time and have a ramp up period of 8 months before reaching nameplate production.

## 19.1 Royalties, Taxes, Depreciation, and Depletion

The Scoping Study project economics include the following key parameters related to royalties, tax, depreciation, and depletion allowances.

- Royalties of 5% of revenue generated are based on the average land lease agreement.
- Federal tax rate of 21% and Tennessee state corporate tax rate of 6.5% are applied.
- Depletion allowance of 22% of heavy mineral sands is applied to sales price.
- Depletion allowances for rare earth concentrate are assumed as 14%.
- Depreciation in the mine and concentrate operations is based on Asset Class 10 – Mining in IRS Table B-1 using GDS of 7 years with the double declining balance method.

## 19.2 Scoping Study Economics

The main Project economic indicators are presented in Table 24.

***Table 24: Project economic measures summary.***

| Economic Measures Summary (After Tax) | Value |
|---|---|
| Annual EBITDA (first five years) | $118M |
| Project NPV (discounted at 8.0%) | $692M |
| Internal rate of return (IRR) | 40% |
| Payback period (from start of operations) | 1.9 y |

*Table 25: Key financial assumptions*

| Financial Assumptions | UoM | Value |
|---|---|---|
| Ilmenite LOM weighted average realized price | $/t | 311 |
| Rutile LOM weighted average realized price | $/t | 1,311 |
| Monazite LOM weighted average realized price | $/t | 17,356 |
| Zircon premium LOM weighted average realized price | $/t | 1,748 |
| Zircon concentrate LOM weighted average realized price | $/t | 787 |
| Discount rate | % | 8 |
| Royalties (leased land only) | % | 5 |
| Federal tax rate | % | 21 |
| Tennessee state corporate tax rate | % | 6.5 |
| Ilmenite depletion | % | 22 |
| Rutile depletion | % | 22 |
| Monazite depletion | % | 14 |
| Zircon premium | % | 22 |
| Zircon concentrate | % | 22 |
| Depreciation | - | 7 year double declining method |

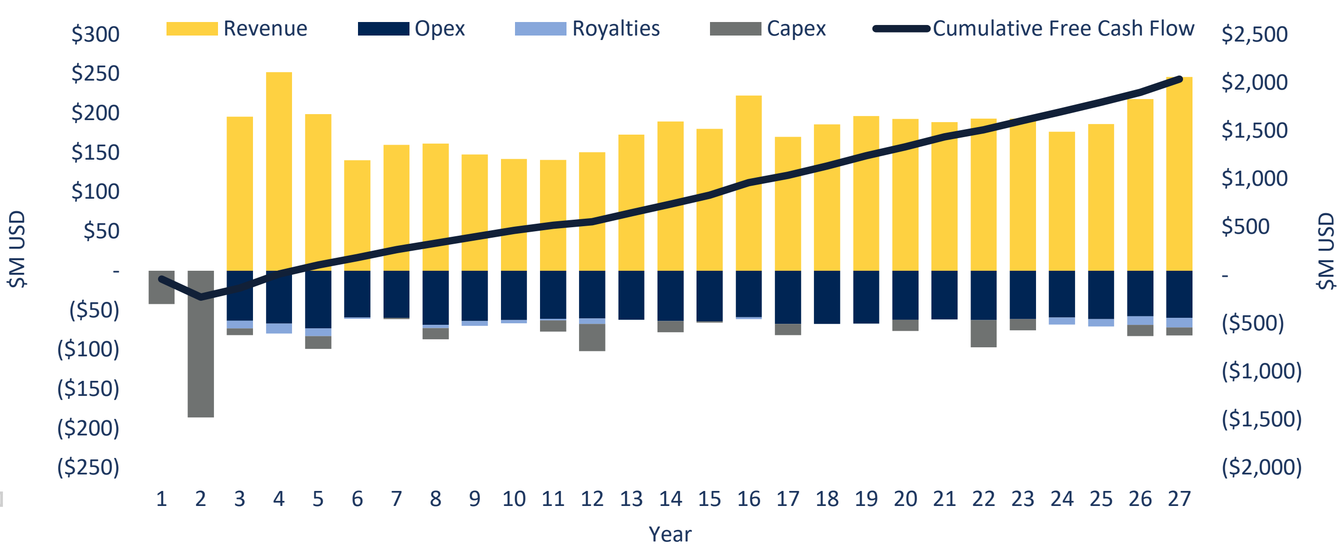



*Figure 40: Titan Project after tax real cashflows.*

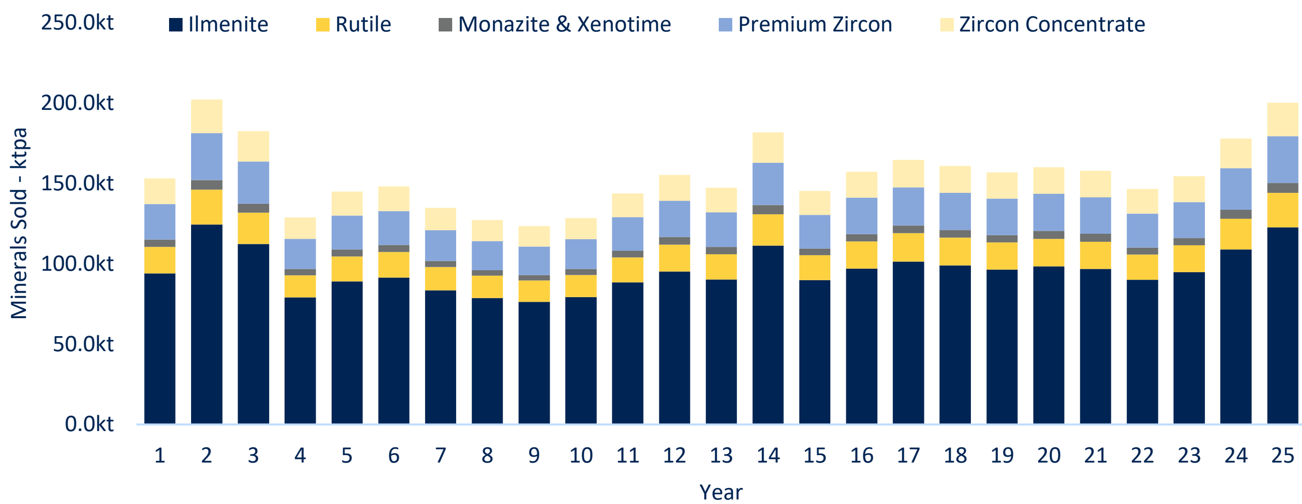



*Figure 41: Titan Project production profile.*

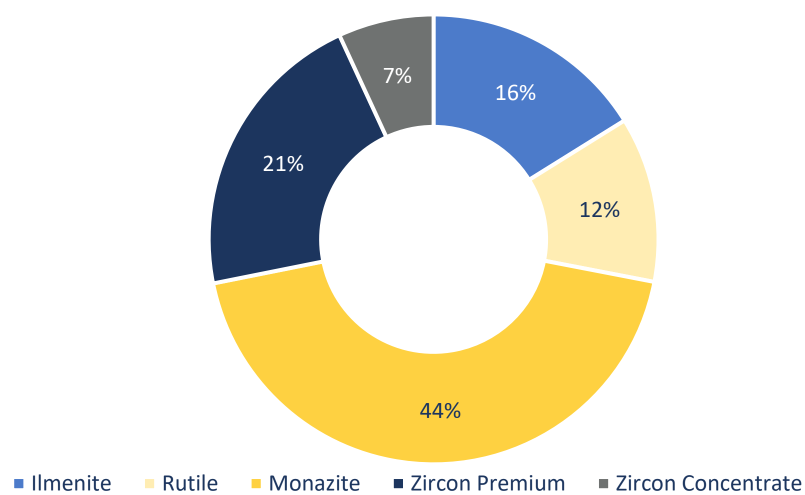



*Figure 42: Titan Project revenue by product %.*

## 19.3 Sensitivity Analysis

The Study have been designed to a Scoping level of detail with an intended accuracy of ± 35%. Key inputs into the Study have been tested by pricing, capital cost, and operating cost sensitivities.

The results highlight that the NPV is most sensitive to Monazite price and OPEX variations, and that IRR is most Sensitive to CAPEX variations.

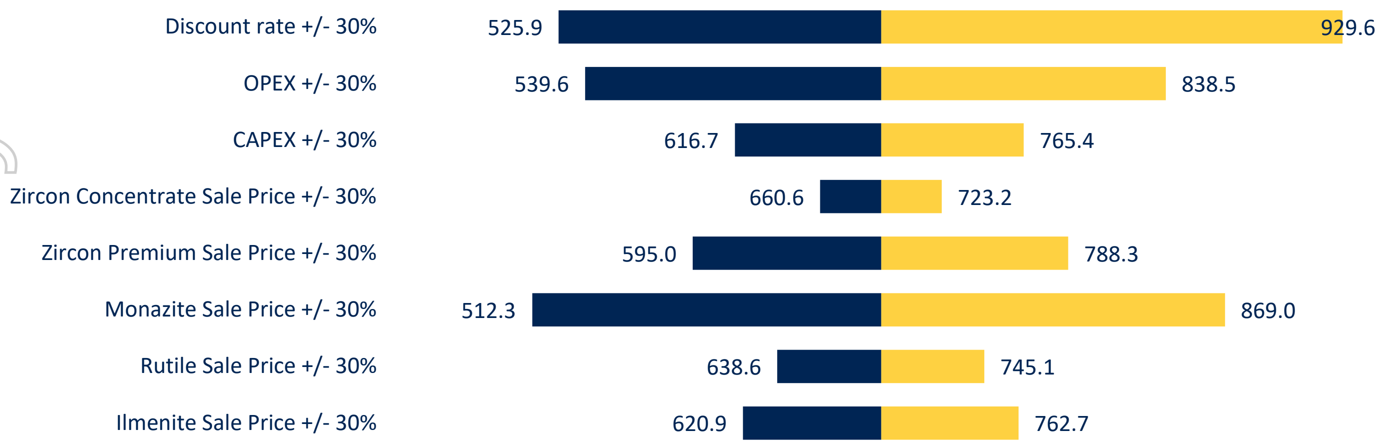



*Figure 43: Titan Project sensitivity analysis results – post tax NPV (US$M).*

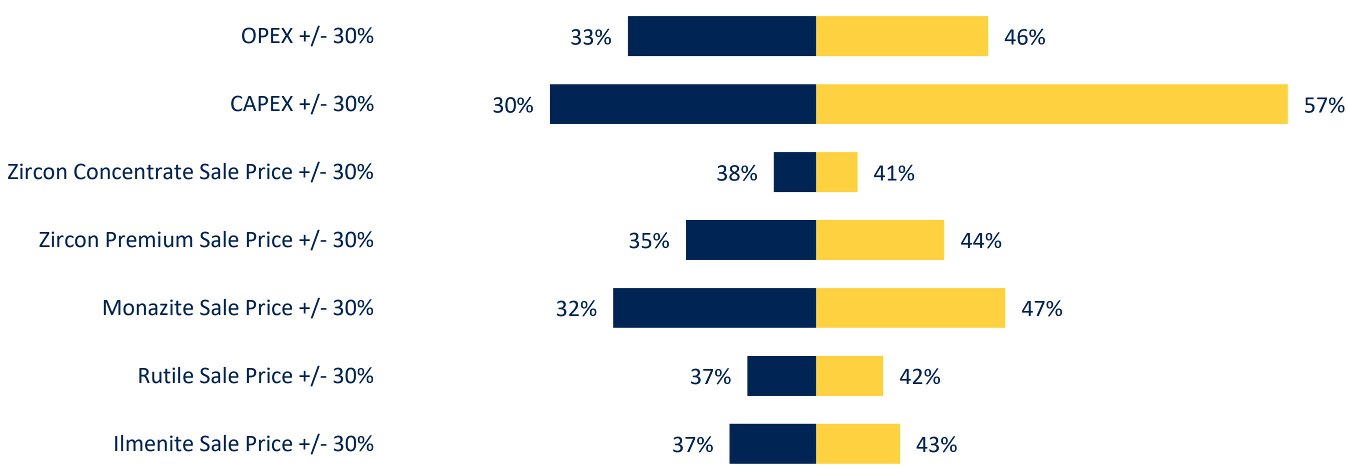



*Figure 44: Titan Project sensitivity analysis results – post tax IRR (%).*

# 20. Adjacent Properties

No proprietary information associated with neighboring properties was used as part of this study.

# 21. Other Relevant Data and Information

No other relevant data exist at this time.

# 22. Interpretation and Conclusions

The QPs are confident in the technical and economic assessment presented in this TRS.

The QPs also recognize that the results of this TRS are subject to many risks including, but not limited to: commodity prices, unanticipated inflation of capital or operating costs, geological uncertainty and geotechnical and hydrologic assumptions.

The Scoping Study highlights several advantages which include:

- Low complexity mining practices can be employed utilizing local service providers.
- Mining footprint can be controlled to limit environmental and social impacts.
- Mining approach presented returns land mass to pre-mining conditions as minimum.
- Signed Memorandum of Understanding (MOU) for rare earth concentrate and titanium minerals (rutile and ilmenite) and zircon products.
- Shipping advantage, given that a large proportion of the rare earth concentrate and titanium (rutile and ilmenite) products are anticipated to be sold within the U.S.
- Exposure to high-demand, future-facing commodities experiencing increasing commodity prices.
- The net present value of the 25-year based Project is $692M at an 8% discount rate and after tax.
- The internal rate of return (IRR) is 40%.

At the time of publication of this Scoping Study report a preliminary feasibility study is planned to be completed.

## 23. Recommendations

The Scoping Study/Initial Assessment demonstrates the Titan Project's importance as a leading U.S. critical mineral project, and puts IperionX in a strong position to rapidly advance next steps in the development process, including:

- Continued exploration and expansion of the Company's land position;
- Advancing project permitting and development approvals;
- Commencement of a pre-feasibility study to optimize mine and process design;
- Performing feasibility study level flowsheet development test work (ongoing);
- Develop a Mineral Demonstration Facility on site (completed desliming, planning wet concentration and mineral separation stages.)
- Investigation of product upgrading and downstream processing;
- Undertaking a lifecycle analysis for the Company's mineral and metal projects and operations;
- Continue implementation of sustainable operating and rehabilitation practices with UTIA;
- Continued stakeholder awareness and engagement; and
- Formalizing agreements with a number of prospective strategic, technical and offtake partners.

# 24. References

Primero Scoping Study Report, Titan Heavy Mineral Sands Project, 40501-REP-GE-002, June 2022.

Mineral Technologies Report, Titan Mineral Sands Project – Benton Ore, Conventional Wet Gravity and Dry Physical Separation Testwork Including Creation of Ilmenite, Rutile, Zircon, and Monazite Concentrate from Provided Ore Samples, MTNA21069, Rev.2, 22 September 2021.

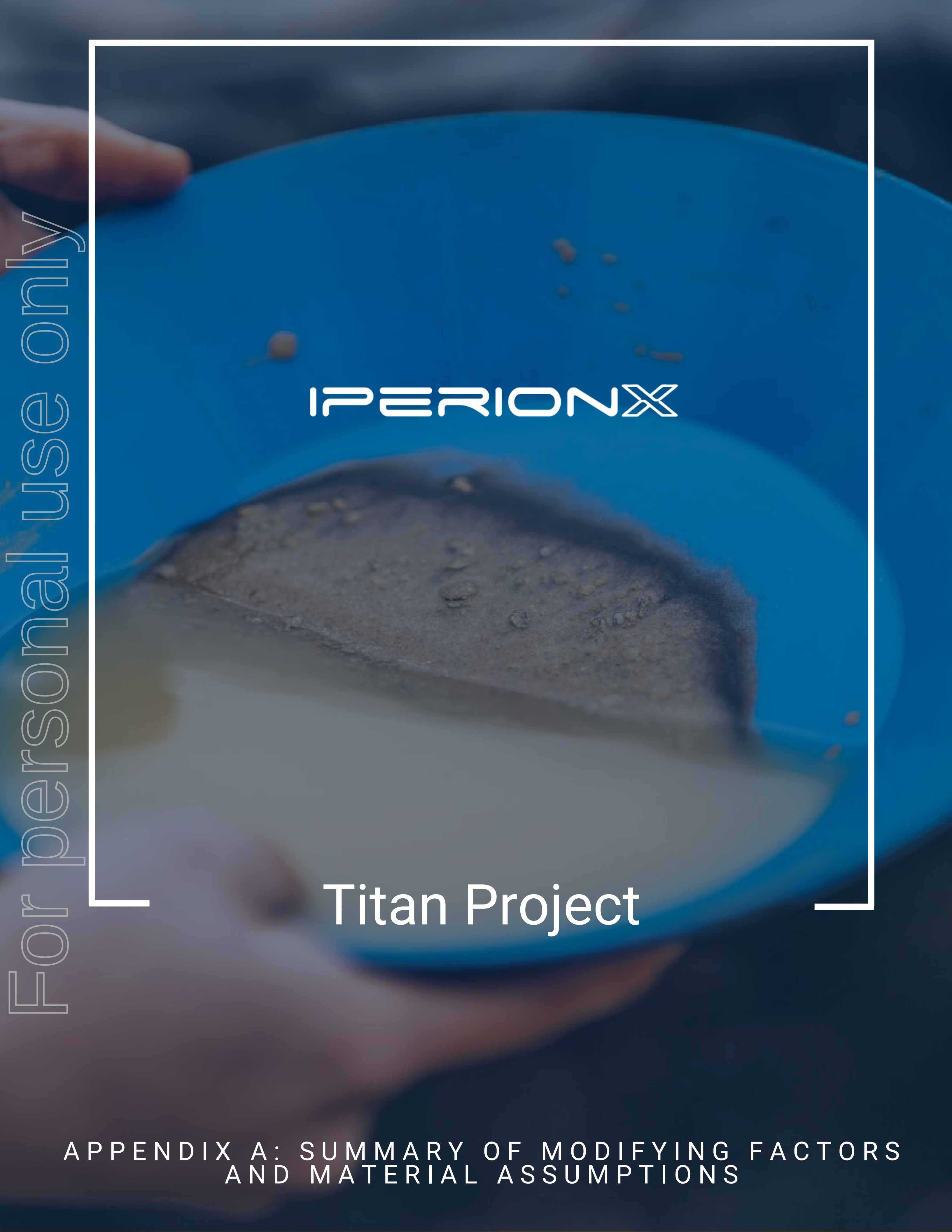
Mineral Technologies Report, Titan Mineral Sands Project – Camden Ore, Scoping Testwork for Wet Gravity, Rare Earth Mineral Flotation and Dry Physical Separation to Produce Concentrates of Zircon, Monazite and Titanium Minerals, MS21/3394979/1, Rev.2, 16 February 2022.

IperionX, ASX Release, Maiden Resource Confirms Tennessee as Major Untapped Critical Mineral Province, 6 October 2021.

## 25. Reliance on Information Provided by the Registrant

Primero has relied upon the following information supplied by IperionX:

- Section 16: Market Studies. Pricing information was based on data sourced from Adamas Intelligence, TZMI and IperionX.
- Section 17: Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups. This is based on the information from HDR, PGS Consults, UTIA and IperionX.





IPERIONX

# Titan Project

## APPENDIX A: SUMMARY OF MODIFYING FACTORS AND MATERIAL ASSUMPTIONS

The Modifying Factors included in the JORC Code (2012) have been assessed as part of the Scoping Study, including mining, processing, infrastructure, economic, marketing, legal, environmental, social and government factors. The Company has received advice from appropriate experts when assessing each Modifying Factor.

A summary assessment of each relevant Modifying Factor is provided below.

| | |
|---|---|
| **Mining** | Refer to Section entitled 'Mining Methods' in the Announcement.<br><br>The Company engaged independent consultants from Primero to carry out pit optimizations, mine design, scheduling, and waste disposal. Modelling and pit sequencing were compiled by Mr. Stephen Miller, a Principal Mining Engineer.<br><br>The mine design is based on an open pit design assuming the following wall design configuration in this Scoping Study:<br><br>• The selected batter and berm configuration is based on 35-degree batters over a vertical height of 10m and 5m berms widths resulting in an overall pit slope of less than 28.6 degrees.<br><br>• With geotechnical, hydrology and material characterization test work still to be done, preliminary designs for the mining voids have used batter and berm configurations from similar mineral sands type projects. These slopes are adequate for the purpose of this study but will require refinement in future studies taking into account the local conditions and geometry.<br><br>Production schedules have been prepared for the mine based on the following parameters:<br><br>• Targeted rougher spiral feed of 1000 tph.<br><br>• Given the nature of the resource model, the block dimensions and the type of deposit, dilution is assumed to be included in into the modelled blocks, requiring no further modification for the purposed of this study in scheduling physicals for the financial model inputs.<br><br>• The mining recovery factor based on the planned mining equipment and the resource model block dimension, the selective mining units is a small percentage of a parent block size and therefore in practice should be 100%.<br><br>• Assumed values of 10% slime for the Upper McNairy and 20% for the lower McNairy.<br><br>• Maximized utilization of Indicated resources at the front end of the mining schedule.<br><br>• Annual scheduling periods.<br><br>• It is planned that the mineralized material would be mined using excavator or front-end loader feeding an in-pit mining unit or mobile mining unit (MMU).<br><br>• The topsoil and dry waste will be mined using conventional excavator/loader and truck mining practices applied in an open pit mining approach.<br><br>• The wet waste sand from the WCP is returned via pipeline to the mine workings where it is discharged by a cyclone cluster. This sand will then be moved be spread by the dozers, with the dewatered slimes from WCP being returned to the mining void by trucks prior to being covered by the dry overburden and inter-burden. |

- The mining process is commenced with the excavation of the pre-mining void.

Costs carried in the Study assume an owner-operated mobile mining units operation and contracted mining fleet for all activities for the mining of the mineralized material and waste including the mining of the mineralized material to the input mining unit.

Alternative mining methods were evaluated at high level in this Study. No other tailings disposal methods were considered in this Study.

The Production Target is approximately of 243 Mt @ 3.0% THM In-Situ with a mine life of 25 years. This equates to approximately 9.7 Mt of mineralized resource processed per year.

The mining schedule delivers an outcome with the first 14 years (the estimated payback period starting from operations is 2.1 years) mining 100% of indicated mineralized resource only and the remaining nine full years mining the inferred mineralized resource currently defined, resulting in a total mine life of 25 years. The schedule is based on 57% of the total mine ROM material being in an Indicated category.

The Company has concluded that it has reasonable grounds for disclosing a production target which includes an amount of Inferred material on the basis that the Inferred Resources included in the early mine plan is modest and over the life of the mine the amount of Inferred Resources is not the determining factor in project viability.

| Mine Production Schedule with % Indicated Category Processed by Time Period | | | | |
|---|---|---|---|---|
| **Years** | **ROM Tons (Mt)** | **Inferred Tons (Mt)** | **Indicated Tons (Mt)** | **% Indicated Tons (%)** |
| 1-14 | 136.5 | 0 | 136.5 | 100% |
| 15-25 | 106.1 | 105.3 | 0.8 | 1% |
| LOM | 242.6 | 105.3 | 137.3 | 57% |

Based on the advice from the relevant Competent Persons, the Company has a high degree of confidence that the Inferred Mineral Resources will upgrade to Indicated Mineral Resources with further infill drilling.

In the unlikely event that the remaining Inferred Mineral Resources are not able to be upgraded, the Project's viability is not affected. This is supported by a stand-alone DCF analysis prepared that assumes only Indicated Resources are included the mine plan in order to demonstrate the economic viability of the Project. Assuming only Indicated Resources are mined, the revised production target would be approximately 136.5 Mt ROM mineralized resource and the mine life would be approximately 14 years. This DCF analysis demonstrates that the Project would still be expected to exhibit levels of profitability that would contribute significant value to IperionX shareholders, even if no additional Indicated Resources are upgraded from existing Inferred Resources or replaced with new Indicated Resources that are yet to be discovered.

**Processing**

Refer to Sections 'Mineral Processing and Metallurgical Testing' and 'Processing and Recovery Methods' in the Announcement.

The Company engaged Mineral Technologies to process four (4) bulk samples through pilot equipment designed to emulate a full-scale Feed Preparation Plant (FPP), Wet Concentrator Plant (WCP), Monazite Flotation/Concentrate Upgrade Plant and a Mineral Separation Plant (MSP).

Assays were conducted by SGS in Lakefield, Canada and Bureau Veritas in Perth, Australia, with XRF, laser ablation / ICPMS and QEMSCAN analytical methods.

The final products and the grades of those final products that were produced form the testwork demonstrated that the Benton Upper and Lower and Camden Lower mineralized resource could be separated using processing stages common to most mineral sands' operations.

Based on the testwork results, it was concluded that a viable commercial operation could be established with appropriate processing options for a 10 Mtpa operation commencing in Benton area.

Further confirmation test work is planned to proceed during the next phase of the project development.

The following overall (WCP & MSP) recoveries are assumed in the Study based on test work interpretation and typical industrial practices.

| Mineral | Overall Recovery |
|---|---|
| Ilmenite | 82.6% |
| Rutile | 60.9% |
| Monazite | 77.1% |
| Zircon | 90.8% |

The Process Design can be described as following:

1. Run of Mine mineralized resource is processed in the Mobile Mining Unit (MMU) which removes trash & oversize. The undersize is pumped to the Feed Preparation Plant (FPP) and Wet Concentrator Plant (WCP)

2. In the FPP, the feed is de-slimed to separate clay and the sand. The slimes are directed to the thickener where they are thickened and then filtered. The sand fed into a constant density tank which is pumped to the rougher spiral stage at 1000 tph at the start of the WCP

3. The WCP comprises of multiple stages of spiral separators which produce a tailings and a heavy mineral concentrate (HMC) stream. The WCP tailings stream is dewatered and pumped to the mining void while the HMC (at a target grade of >85% THM) is dewatered and trucked to the Monazite Separation Plant.

4. The Monazite Separation Plant which consists of a flotation circuit and wet gravity circuits, to produce a monazite product and an upgraded HMC which consists predominantly of the titanium minerals & zircon minerals. The upgraded HMC is the feedstock for Mineral Separation Plant (MSP).

5. The MSP consists of a dryer, multiple stages of electrostatic separators, magnetic separators and wet gravity separators to produce ilmenite, rutile, premium zircon and zircon concentrate.

## Infrastructure

Refer to Section entitled 'Infrastructure' in the Announcement.

Titan Project is strategically located near Camden, Tennessee, and will benefit from significant cost advantages due to the location and proximity to low cost, world-class infrastructure.

The existing infrastructure includes low-cost power and gas, with high-capacity transmission lines near the Project, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports. Potential water sources include nearby surface water bodies but will likely involve shallow groundwater.

The Project's mineral sands resources and nearby Wet Concentrator Plant (WCP) are located approximately 17 miles northwest of the city of Camden, Tennessee. The Project also includes a dry Mineral Separation Plant (MSP) that is located approximately 1.2 miles southwest of the city of Camden, Tennessee. The distance separating the two plants is approximately 19 miles and accessed via public roads and highways.

The Study was managed by Primero Group. Primero Group's capabilities includes technical study, detailed engineering, procurement, construction management, and contract operations. All infrastructure including on site non-process infrastructure related capital and operating

| | |
|---|---|
| | costs were estimated by Primero Group. |
| **Marketing** | Refer to Section entitled 'Market Studies' in the Announcement.<br><br>*Rare Earth Concentrates*<br><br>Test work to date has highlighted that the rare earth minerals at the Titan Project contain a high percentage of rare earth oxides, with significant proportions of the highly valuable heavy rare earths terbium and dysprosium as well as the valuable light rare earths neodymium and praseodymium identified within IperionX's monazite and xenotime mineral concentrates.<br><br>In April 2021, IperionX and Energy Fuels signed a Memorandum of Understanding for the supply of monazite sands from IperionX's Titan Project in Tennessee to Energy Fuels' White Mesa Mill in Utah. Energy Fuels and IperionX are continuing to evaluate expanding their collaboration to establish a fully integrated permanent rare earth magnet supply chain in the U.S.<br><br>In March 2022, Energy Fuels undertook laboratory evaluation of rare earth mineral concentrates from IperionX's Titan Project in west Tennessee. Energy Fuels' evaluation indicates that IperionX's rare earth minerals are suitable as a high quality feedstock to produce a high purity mixed rare earth carbonate at Energy Fuels' White Mesa Mill in Utah. Energy Fuels is currently producing a mixed rare earth carbonate at commercial scale at its mill. This commercial product is the most advanced rare earth material being produced in the U.S. today at scale.<br><br>*Titanium Products*<br><br>Titanium minerals found at the Titan Project are dominated by rutile and highly altered ilmenite, which are feedstocks for a variety of uses including for titanium dioxide, titanium metal and other applications including welding and nanomaterials. Natural rutile is a high-grade titanium dioxide feedstock (typical $TiO_2$ content of 92-95%), which commands a significant price premium in the titanium dioxide market. Ilmenite is also a titanium dioxide feedstock (typical $TiO_2$ content of 58-62%), which can be sold directly to pigment producers or can be used as a feedstock for synthetic rutile production.<br><br>Test work to date indicates that ilmenite mineral found at the Titan Project is likely to be suitable for the chloride ilmenite market, with a $TiO_2$ content greater than 58%. Additionally, the rutile product has the potential to be a high-grade feedstock, with a $TiO_2$ content of between 93% and 97%.<br><br>In December 2021, the company entered into a Memorandum of Understanding with The Chemours Company (Chemours) for the supply of the titanium feedstocks ilmenite and rutile from IperionX's Titan Project in west Tennessee to Chemours. Chemours is one of the world's largest producers of high quality titanium dioxide products for coatings, plastics, and laminates, with a nameplate titanium dioxide capacity of 1,250,000 tons globally, including New Johnsonville, Tennessee, located 20 miles from IperionX's Titan Project, and DeLisle, Mississippi, located 1,100 miles by back haul barge on the Mississippi River.<br><br>The MoU contemplates the commencement of negotiations of a supply agreement between IperionX and Chemours for an initial five year term on an agreed market based pricing methodology for the annual supply of up to 50,000 tons of ilmenite and 10,000 tons of rutile, which is equivalent to approximately 50% of total ilmenite production and approximately 60% of total rutile production over the first 5 years of operations at the Titan Project.<br><br>*Zircon Products*<br><br>Test work to date indicates that zircon mineral found at the Titan Project is likely to be suitable for the premium zircon market, with a $ZrO_2+HfO_2$ content greater than 65%, with the potential to be sold into the domestic U.S. zircon premium market.<br><br>In February 2022, the company entered into a Memorandum of Understanding with Mario Pilato BLAT S.A. (Mario Pilato) for the potential supply of zircon products. Mario Pilato is a leading international supplier of raw materials for ceramics, glass and refractories, headquartered in Valencia, Spain The MoU contemplates the commencement of negotiations of a supply agreement between IperionX and Mario Pilato for |

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| | an initial five year term on an agreed market based pricing methodology for the annual supply of up to 20,000 tons of zircon products from the Titan Project, which is equivalent to approximately 50% of total zircon production over the first 5 years of operations at the Titan Project.<br><br>*Price Forecasts*<br><br>The Company engaged Adamas Intelligence, an independent research and advisory consultant focused on strategic metals and minerals, to provide a pricing methodology and price forecast for rare earth concentrates produced at the Titan Project. The pricing methodology is based upon Adamas' forecast pricing of IperionX's rare earth concentrates with reference to the value of rare earth oxides contained, with a premium applied by Adamas for the specific rare earth oxide enrichment, including heavy rare earths, contained within the Titan Project product.<br><br>The Company has utilized commodity pricing based upon forecasts from TZMI for ilmenite, rutile and zircon products, adjusted for economic factors. TZMI is a global independent consulting and publishing company which specializes in all aspects of the mineral sands, titanium dioxide and coatings industries, particularly the titanium and zirconium value chains. Zircon concentrate pricing forecasts have been assessed by the Company as receiving a 55% discount to the price of premium zircon, a standard industry benchmark discount.<br><br>IperionX will continue to focus on developing market relationships and discussions with potential off-take partners. |
| **Economic** | Refer to Sections 'Capital and Operating Costs' and 'Economic Analysis' in the Announcement.<br><br>Capital Estimates for the mine and process plant have been prepared by Primero Group using a combination of cost estimates from suppliers, historical data, reference to recent comparable projects. Costs are presented in US$ for Q2 2022 and are exclusive of escalation. The intended accuracy of the initial capital cost estimate for the Project is ± 35%.<br><br>Capital costs include the initial capital and deferred and sustaining capital. Capital costs make provision for mine closure and environmental costs.<br><br>The capital cost estimate (CAPEX) was developed in two parts:<br>1) Direct costs for the mine pre-production, wet concentrate plant (WCP), mineral separation plant (MSP), common services including reagents and air/water services and non-process infrastructure.<br>2) Indirect costs were estimated for engineering, construction, and owner's costs.<br><br>For the mine, the CAPEX estimation is based on the following aspects: clearing & grubbing, mine development, pumping & infrastructure, mobile mining equipment, and mining contractor mobilization.<br><br>For the WCP and MSP facilities, the process design criteria, flowsheets and mass balance calculations were produced with sufficient detail to allow for the preparation of a mechanical equipment list. Equipment pricing was collected from benchmark information. The Project used as a benchmark is a similar circuit producing both WCP and MSP products. The Project is currently under construction in Australia, being managed by Primero. The overall supply cost of mechanical equipment was then used to factor all other direct discipline costs such as concrete, steelwork, platework, piping, electrical, and instrumentation and control. These factors were also derived from the benchmarked project.<br><br>In-direct costs, including EPCM, off-site management, capital spares, flights and accommodation, first fills and commissioning costs were also factored from the Project direct costs.<br><br>Project contingency was calculated as a factor of the total direct and in-direct costs.<br><br>For the (NPI) non-process infrastructure, allowances were made for some costs not related to the mechanical equipment supply including process buildings and non-process infrastructure. |

The cost estimate basis along with the exchange rates used for the Project CAPEX is 0.73 USD/AUD.

There are no government royalties associated with the Project.

A royalty of 5% of revenue generated is included based on the average land lease agreement.

Rehabilitation and mine closure costs are included within the reported operating cost and sustaining capital figures.

A detailed financial model and discounted cash flow (DCF) analysis has been prepared by the Company, using inputs from the various expert consultants, in order to demonstrate the economic viability of the Project. The financial model and DCF were modelled with conservative inputs to provide management with a baseline valuation of the Project.

The DCF analysis demonstrated compelling economics of the prospective Project, with an NPV (after-tax, at an 8% discount rate) of US$692 million and an IRR of 40%.

The DCF analysis also highlighted the low operating costs, low royalties, and low corporate tax rates.

Sensitivity analysis was performed on all key assumptions used. The robust Project economics insulate IperionX's Titan Project from variation in market pricing, capital expense, or operating expenses.

Payback period for the Project is 1.9 years from the start of operations. The payback period is based on free-cash flow, after taxes.

IperionX estimates the total capital cost to construct the mine and process plants to be US$237 million.

IperionX has been working on progressing the Project to be construction ready during 2023 and production in 2025.The Company engaged the services of advisory firm, Taylor Collison, with regards to Project economics. Taylor Collison is a financial advisory firm which specializes in multiple sectors, including metals and oil & gas. Taylor Collison is well regarded as a specialist capital markets service provider and have raised project development funding for companies across a range of commodities including substantial experience in the industrial and specialty minerals sector.

Following the assessment of a number of key criteria, Taylor Collison has confirmed that, on the basis that a definitive feasibility study arrives at a result that is not materially worse than the Scoping Study as noted above, IperionX should be able to raise sufficient funding to develop the Project. Taylor Collison has come to this view by examining a range of relevant aspects that may influence funding. These include:

- The favorable strategic setting for the specific commodities prevalent at the Titan Project;
- The likely appetite of resources industry equity fund managers to support a funding scenario, based on the Scoping Study outcomes;
- Recently completed funding arrangements for similar development projects;
- The range of potential funding options available;
- The favorable IRR and margins generated by the Project; and
- The track record of the IperionX Board and management team.

An assessment of various funding alternatives available to IperionX has been made based on precedent transactions that have occurred in the mining industry, including an assessment of alternatives available to companies that operate in industrial and specialty minerals sector. The assessment and advice from Taylor Collison indicates that, given the nature of the Project, funding is likely to be available from a combination of resources funds (both traditional equity fund managers and strategic/private equity investors), debt (from commercial banks or non-bank resources lenders) and offtake backed funding agreements (with end users). It is important to note that no funding arrangements have yet been put in place as these discussions continue to take place. The composition of the funding arrangements ultimately put in place may also vary,

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|---|---|
| | so it is not possible at this stage to provide any further information about the composition of potential funding arrangement.<br><br>Since initial exploration of the Titan Project in 2020, the Company has completed extensive drilling, sampling, metallurgical test-work, geological modelling and defined an Indicated and Inferred Mineral Resource Estimate. Over this period, with these key milestones being attained and the Project de-risked, the Company's market capitalization has increased from approximately US$5 million to over US$80 million. As the Project continues to achieve key milestones, which can also be significant de-risking events, the Company's share price could be anticipated to increase.<br><br>The Company is debt free and is in a strong financial position, with approximately US$11.3 million in cash on hand at March 31, 2022. The current financial position means the Company is soundly funded to continue into a PFS phase to further develop the Project.<br><br>IperionX's shares are listed on the Nasdaq Capital Market (Nasdaq) and the Australian Securities Exchange (ASX). Nasdaq is one of the world's premier venues for growth companies and provides increased access to capital from institutional and retail investors in the United States.<br><br>IperionX has an experienced and high-quality Board and management team comprising highly respected resource executives with extensive technical, financial, commercial and capital markets experience. As a result, the Board has a high level of confidence that the Project will be able to secure funding in due course, having particular regard to:<br><br>• Required capital expenditure;<br>• IperionX's market capitalization;<br>• Recent funding activities by directors in respect of other resource projects;<br>• Recently completed funding arrangements for similar or larger scale development projects;<br>• The range of potential funding options available;<br>• The favorable key metrics generated by the Titan Project;<br>• Ongoing discussions for potential offtake agreements; and<br>• Investor interest to date. |
| **Environmental Social, Legal and Governmental** | Refer to the sections entitled 'Property Description' and 'Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups' in the Announcement.<br><br>IperionX is focusing on becoming the leading developer of low-to-zero carbon, sustainable, critical materials in the U.S., and is actively taking a "sustainable first" approach to all areas of Titan Project development, aiming to be a global leader in sustainable critical mineral extraction.<br><br>The Company is working with Presidio Graduate School's expert consulting division, PGS Consults, to undertake Environmental, Sustainability and Corporate Governance studies to define best practice mining and processing operations in this leading critical mineral province, and is in the process of conduct activities including a materiality assessment, life cycle assessment, ESG-leadership playbook, and an environmental health and safety (EHS) management system gap assessment.<br><br>Further, the Company is working with the University of Tennessee's Institute of Agriculture (UTIA) to conduct research and field trials for sustainable development practices at the Titan Project, including a priority focus on land rehabilitation best practices that improve post-mining land use and agricultural yields, and provide for carbon sequestration and carbon credit creation opportunities. UTIA activities will be led by Dr. Forbes Walker, a world-renowned professor in soil science with deep experience in land rehabilitation, including the famed Copper Basin in southeastern Tennessee.<br><br>IperionX intends to implement fully renewable power sourcing options for the Titan Project, including the assessment of existing on-grid solutions currently provided by incumbent power generators and suppliers in the area.<br><br>A particular focus of mining and engineering activities in the Scoping Study has been the development of a sequential mining method to allow for a low cost, reduced area footprint and environmentally sustainable mining process. These rehabilitation methods have been used |

successfully in the U.S. and IperionX aims to improve on these examples.

The support of the local community is fundamental to IperionX's license to operate, and the Company has conducted significant and regular community engagement activities since it was established.

IperionX is dedicated to building sustainable community relationships, and is working in a structured way to allow the Company to continue to build trust, broaden support, improve knowledge and promote community participation and engagement in the development of the Titan Project.

Groups and organizations with who IperionX regularly engages with include the Tennessee Department of Environment and Conservation, the Tennessee Valley Authority, the University of Tennessee, Tennessee state government officials, local residents and business owners, local government officials, local school systems and technical colleges.

At March 31, 2022, the Titan Project comprised of approximately 11,071 acres of surface and associated mineral rights in Tennessee, of which approximately 137 acres are owned and approximately 10,934 acres are subject to exclusive option agreements. These exclusive option agreements, upon exercise, allow us to lease or, in some cases, purchase the surface property and associated mineral rights. Other than the option agreements, there currently are no material liens or encumbrances on the property comprising the Titan Project.

IperionX has received a Memorandum of Option or Memorandum of Contract signed by each landowner and each Memorandum is recorded in the local register of deeds. IperionX has engaged Johnston, Allison & Hord, P.A. ("JAH") to coordinate and review title searches for each optioned property to confirm that the respective landowners own and control both the surface real estate and mineral rights for the Project. Preliminary title searches on all properties were completed as of the date of recording of each Memorandum of Option.

In order to develop the Project, we will be required to obtain new governmental permits authorizing, among other things, any site development activities and site operating activities.

IperionX has engaged HDR to support permitting activities on the proposed Project.

## Material Assumptions

| Study Overview | |
|---|---|
| Life of project | 25 Years |
| Cost and pricing basis | 2022 US$ |
| Currency | US Dollars |
| Cost escalation | 0% |
| Revenue escalation | 0% |
| Study accuracy | ±35% |
| **Mining** | |
| Mineral resource | 431 Mt |
| Portion of production target – indicated | 57% |
| Portion of production target - inferred | 43% |
| Annual average ROM production | 9.7 Mt/y |
| Life-of-mine average feed grade | 3% HMS in-situ |
| Mining recovery | 100% |
| Total mineralized resource mined | 243 Mt |
| Total waste rock | 163 Mt |
| Life-of-mine average strip ratio | 0.67:1 waste:ROM |
| **Processing Plant** | |
| Annual average production – rare earth concentrate | 4,600 tons |
| Annual average production – rutile | 16,700 tons |
| Annual average production – ilmenite | 95,500 tons |
| Annual average production – premium zircon | 22,400 tons |
| Annual average production – zircon concentrate | 16,100 tons |
| Ilmenite recovery | 82.60% |
| Rutile recovery | 60.90% |
| Monazite recovery | 77.10% |
| Zircon recovery | 90.80% |
| **Pricing** | |
| Ilmenite LOM weighted average realized price | US$311/t |
| Rutile LOM weighted average realized price | US$1,311/t |
| Monazite LOM weighted average realized price | US$17,356/t |
| Premium zircon LOM weighted average realized price | US$1,748/t |
| Zircon concentrate LOM weighted average realized price | US$787/t |
| **Other** | |
| Initial capital | US$237.2 million |
| Sustaining and deferred capital | US$198.5 million |
| Corporate tax rate | 21% Federal & 6.5% State |
| Discount rate | 8% |