

WHITE PAPER

**ELIS
PROJECT**

**Intelligent Leak
Detection in Tailings
Ponds and Beyond**



ELISTECH



“We are looking at an absolutely unique device, this unequalled level of technology, will probably revolutionize the industry.”

J.H. Tak,
Expert on Leak Detection



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EXECUTIVE SUMMARY

Tailings ponds present a massive challenge across a wide range of industries. As a product of industrial activities such as **mining and oil extraction** tailings and their management can have a severe impact on the **environment** as well as on the **reputation** of the operator. On the top of that a leaking tailings pond can have a significant negative impact on the **profitability of the industry participant** due to fines and lawsuits by NGOs and governments.

Typical leak detection procedure is time consuming, requires human presence in the toxic environment for extended periods of time and does not guarantee a successful outcome.

ELIS TECHNOLOGIES LIMITED (ELIS) is an Irish company devoted to **high-tech solutions in the realm of intelligent leak detection** in tailings ponds and beyond. ELIS has developed a set of **intelligent autonomous robots** that use patent-pending 3D GPS eMapping technology enabling quick and systemic monitoring of tailing ponds of all sizes. The state-of-the-art software that powers the ELIS robots is backed by blockchain technology, thus enabling the survey data to be timestamped and stored for future references. Furthermore, blockchain also powers the service delivery relying on ELIS's own cryptocurrency called ELIS token. While **eLagoon** and **eRover** robots are suitable mostly for large scale operations, ELIS has also developed **eRaptor** that is also suitable for smaller projects such as roofs and swimming pools.

This unique hardware-software combination facilitates both quick and efficient leak detection, as well as production of evidence for compliance purposes.

Target customers for the ELIS Project are industry operators involved in large-scale operations that require tailings ponds with geomembranes. Taking in the account the facts that over 250 million square meters of geomembranes are produced each year and that the global geomembrane market is expected to reach nearly \$4 billion by 2022, the target audience is abundant.

The team working on the ELIS Project consists of industry experts, IT experts, academics and mechanical engineers with more than 25 years of experience in the leak detection industry.

ELIS is already **present on the global market** and supported by branches in Ireland, Israel, South Korea, Czech Republic and Slovakia.

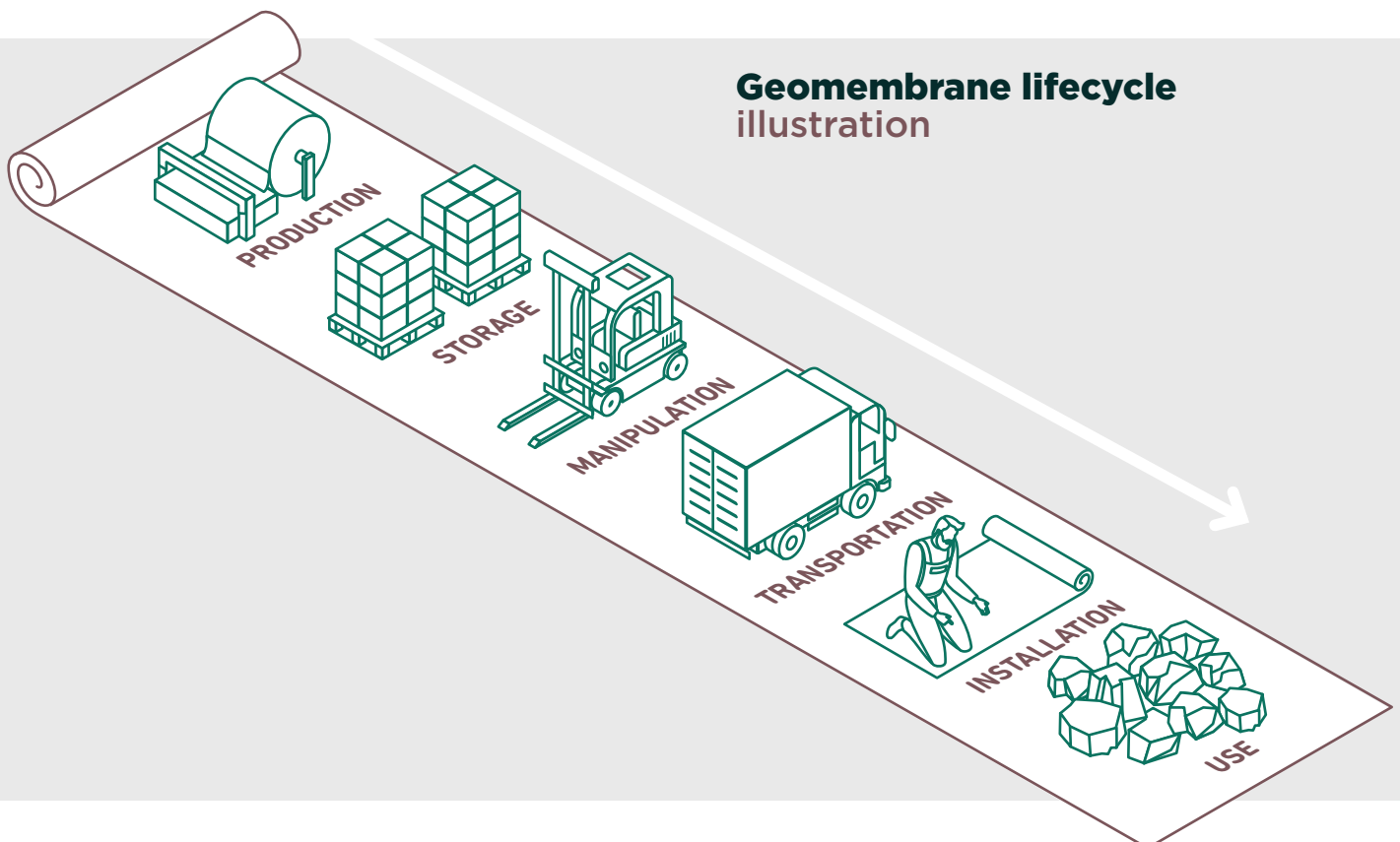
ELIS PROJECT

CHALLENGE

Any solid waste that cannot be recycled usually ends up in a landfill where it can be stored in a relatively safe manner. On the other hand liquid waste has to undergo a different treatment. Due to lack of other options, liquid industrial waste often ends up in retention basins, eLagoons and reservoirs (below only as **'tailings ponds'**).

Waterproof geomembranes are used to prevent any leakage of harmful substances from tailings ponds into the environment. Even though materials out of which waterproof geomembranes are made, such as high-density polyethylene (HDPE), have high impermeability and chemical resistance, their mechanical capabilities are relatively weak. This leads to significant risks for the integrity of geomembranes. That is why geomembranes often develop tears and other faults that cause the stored liquid waste to leak into the surrounding, thus contaminating the ground water and causing potential liabilities for the operator. Unattended leaks create unnecessary environmental, regulatory and economic risks. Dealing with leaks in tailings ponds has been a significant challenge for the industry operators for decades.

For the geomembranes to perform as required, faulty seams, holes and tears must be kept to a minimum during the various stages of the geomembrane lifecycle. This is particularly hard during manipulation, transportation and installation stages.





Today leak detection relies on relatively primitive traditional methods performed manually. This is time-consuming, involves human error factor and often causes leaks to be detected too late after a substantial contamination already occurred.

The most widely known and used method of testing the tightness of waterproof geomembranes is the electrical leak location method, adopted in 2015. The American standard ASTM D6747-15: Standard Guide for Selection of Techniques for Electrical Leak Location of Leaks in Geomembranes is used by numerous countries which have incorporated the American approach into their legislation.

“Leaks due to membrane damage caused by storage, manipulation or installation can have far-reaching consequences once the geomembrane is installed and used.”

The principle of the test is based on an artificial electric field, which is created and measured above and below the membrane. Based on this, the measuring device can observe changes in the field, thus identifying the location of the leak. Both uncovered geomembranes, as well as those covered with a protective layer, can be inspected by this method. Nevertheless, this method is highly inefficient because it has to be performed manually by technicians.

SOLUTION (PRODUCT)

In ELIS we know that leak detection in tailings ponds with geomembrane can be **quicker, safer, cheaper and more transparent**. It is time to use the available scientific and industry knowledge of the 21st century and utilize it in the leak detection process.

A combination of state-of-the-art technology with industry know-how enabled ELIS to create **a line of intelligent fully autonomous robots that use patent-pending 3D GPS eMapping technology**. These robots are robust enough to operate in toxic areas that are otherwise inaccessible to humans and can work nonstop both on water and land. These devices revolutionize conventional industry techniques where leak detection is still performed manually by humans.



TECHNOLOGY - HARDWARE

INTRODUCING ELIS ROBOTS

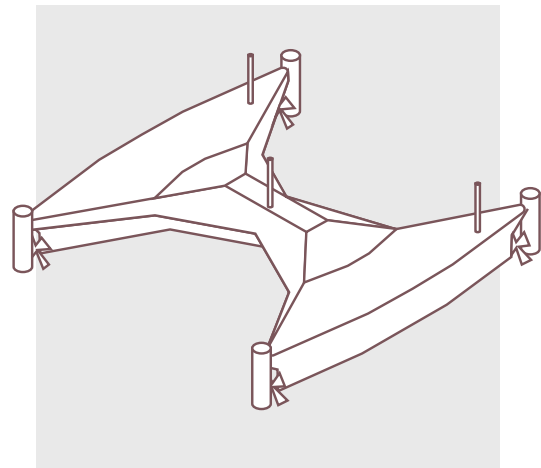
ELIS has developed a set of three different robots that cater for different leak detection situations.

1. eLagoon

eLagoon robot is the only device on the market able to perform measurements on a **filled toxic tailings pond**. Unlike our competitors, who have to empty the pond prior to measuring, eLagoon device can operate in any liquid, be it water, acids or toxic substances, and it is suitable for all kinds of environments, such as eLagoons, liquid landfills, mines and water reservoirs.

eLagoon is equipped with 3D GPS eMapping technology, allowing a fully automated monitoring of any liquid toxic environment, even those with multiple geomembranes. GPS navigates its measurement route and the results of the measurements are logged into an immutable record on blockchain.

The eLagoon robot can perform measurements at a speed of 1 sq. meter per second and is able to find even the smallest tears in the geomembrane. eLagoon robot provides the most accurate solution on the market for measuring geomembrane tightness in a liquid environment.

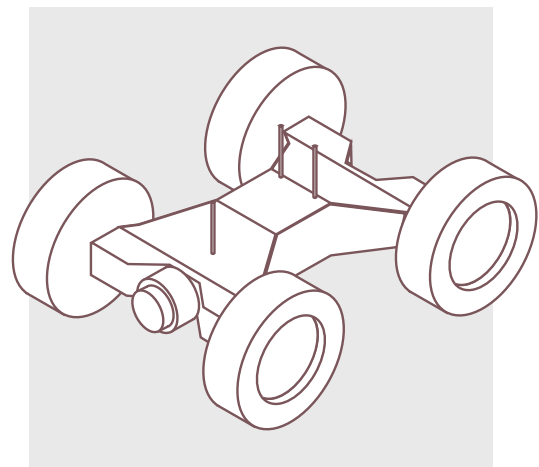


2. eRover

eRover is the only fully programmable and autonomous robot on today's market able to monitor **covered geomembranes**. eRover has a measurement speed of 0.5 sq. meter per second and can find the tiniest tears in a geomembrane.

With the ability to measure under a great variety of surfaces such as soil, sand, gravel and clay-loam, eRover is perfect for monitoring geomembranes that technicians are unable to access safely.

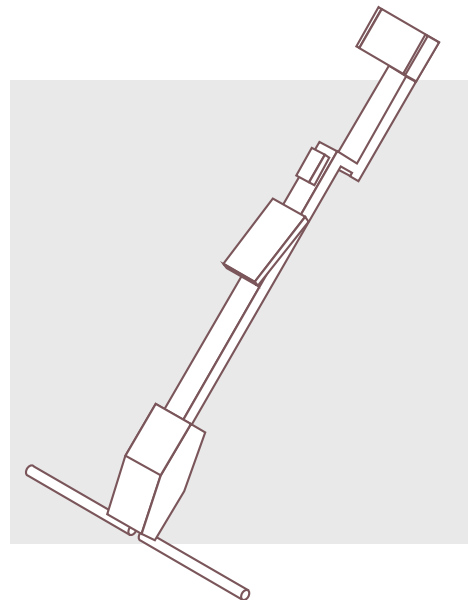
Equipped with 3D GPS eMapping, eRover is fully automated and reports its measurements directly to blockchain. eRover allows our customers to save a lot of time and costs.





3. eRaptor

Some projects may be too small for the eRover or eLagoon. Nevertheless, ensuring a geomembrane is ready for use after installation is an essential matter that must not be neglected in any project. eRaptor is an arc-tester capable of detecting any damage on **uncovered geomembranes**. Be it smaller projects such as flat roofs, or swimming pools or very large projects such as landfills or tunnels eRaptor is the right tool for the job.



eRaptor features a safety handle, a lightweight yet powerful battery hidden within the device and is equipped with state-of-the-art 3D GPS eMapping technology thus allowing it to precisely navigate and pinpoint the exact leak locations even on the extremely large areas.

TECHNOLOGY – SOFTWARE

INTRODUCING 3D GPS eMapping

As a direct result of years of research and development, ELIS Technologies has revolutionized the outdated and ineffective techniques and technology used in the leak detection industry today by creating a smart technological solution called 3D GPS eMapping.

3D GPS eMapping is a patent pending, intelligent system of specially designed sensors and electronic features. The system autonomously navigates the robot during the process of survey of the selected location and gathers spatial readings of the electric field potentials as well as GPS coordinates. Data are interpreted by a neuron network and are logged onto blockchain, thus creating indisputable proof of the measurement, its parameters and its outcomes. 3D GPS eMapping fully automates the process of monitoring and analysing data through the use of drone technology, GPS mapping and AI algorithms.

Every ELIS device is equipped with the 3D GPS eMapping technology.





INTRODUCING BLOCKCHAIN AND ELIS TOKEN

Blockchain technology is changing the way entire industries operate and the leak detection industry is no different.

In essence blockchain enables the creation of immutable record with timestamp that can prove the existence of some event at a certain point of time. In the realm of leak detection, blockchain can be used to prove the execution of a leak detection survey and its results to any relevant authorities. Blockchain thus provides a new form of an immutable certificate. Offering this technology to our clients is a huge step forward in the leak detection industry.

The business model of ELIS is based on the provision of services to clients (hardware as a service). All hardware (robot) remains the property of ELIS. To use the hardware, the client must use the ELIS Platform.

ELIS Platform is an online interface through which clients can use the services of ELIS. In order to purchase services on the ELIS platform, the client must possess ELIS Token (a form of cryptocurrency). ELIS token is a medium for payment for services on ELIS Platform. ELIS token can be purchased directly from ELIS or from a public exchange (public exchange listing is planned in 2019). After ELIS token purchase, these can be used for the payment for any services available on the ELIS Platform.

ELIS token is an Ethereum based token that complies with the ERC-20 standard. The total token supply is 100,000,000. Since 4Q 2018 ELIS TECHNOLOGIES LIMITED has been doing an ongoing presale of the tokens.

Token Sale Information

Token Name	→	ELIS Token
Token Symbol	→	XLS
Token Supply	→	100,000,000
Protocol	→	ERC-20
Accepted Currencies	→	ETH, BTC, FIAT
Pre-Sale	→	Q3 2018 - Q4 2019
Public Sale	→	Q4 2019 - Q1 2020



THE MAIN ADVANTAGES OF ELIS AUTONOMOUS ROBOTS SQUARE DESIGN:

1. *Can monitor remote areas that are difficult to reach.*

2. *Autonomous navigation using GPS without the need for direct oversight.*

3. *Data confidentiality: robot, unlike human staff, is completely discreet. It will not disclose any information to third parties that could result in bad publicity. Only robot and client know about the leaks found. Client can access the survey results through a private client zone. Leaks are not recorded onto a public blockchain.*

4. *eRover robot passes on average 0.5 sq. meter in 1 sec, thus covering 43,200 sq. meters in 24 hours. This is nearly 6-times faster than any traditional leak detection method, with no additional cost for a technician. This results in significant time and cost reduction for the client.*

5. *The eLagoon robot can measure 1 sq. meter per sec, thus covering 86,400 sq. meters in 24 hours .*

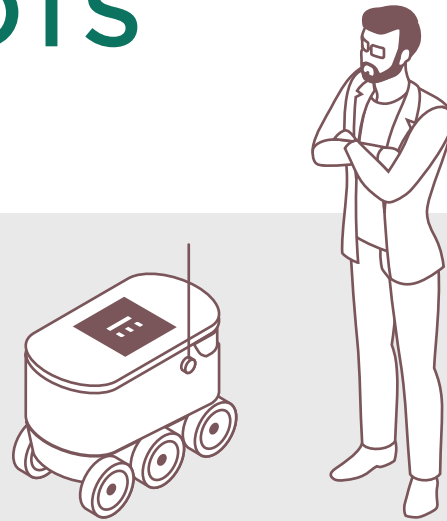
6. *Unlike humans, robots can also perform monitoring activities in poor weather & climate conditions as well as during the night-time.*

7. *Thanks to the built-in GPS tracker and certificates issued on the blockchain, the client can be certain that every sq. meter had been analysed after a survey had been performed.*

8. *In the future, client can prove to the relevant authorities that a survey had been performed thanks to the immutable record on the blockchain.*



LEAK DETECTION PERFORMED BY TECHNICIANS VS ELIS ROBOTS



LEAK DETECTION PERFORMANCE	ELIS ROBOT	HUMAN TECHNICIAN
NON-STOP OPERATIONS 24/7	✓	✗
FILLED LAGOON	✓	✗
TOXIC ENVIRONMENT	✓	✗
INACCESSIBLE AREAS	✓	✗
GPS PRECISION	✓	✗
VERIFIABLE DATA	✓	✗



OPPORTUNITIES IN THE LEAK DETECTION INDUSTRY

Despite the increased need for a speedy leak detection service, all surveys in the industry are still performed manually by technicians, thus making them inefficient, costly and without a guarantee that the entire area had been properly surveyed.

Most competitors are still using systems based on an analog model, which reduces the efficiency and precision of the survey process.

ELIS has developed a brand-new system based on more than 25 year experience in the leak detection industry that provides a state-of-the-art combination of hardware and software. ELIS brings to the market a revolutionary product that will change the entire industry. The most attractive features of the ELIS Project:

- **Cost and time saving.** *ELIS robots can work faster and cheaper than the traditional technicians.*
- **Automation of the leak detection process.** *By removing the human element ELIS is able to offer faster, more reliable and cheaper solutions for its clients. A monitoring process which in the past could only be done when a technician was present is now fully automated.*
- **More precision.** *Introduction of the 3D GPS eMapping that revolutionizes the quality of the results, pinpointing the leakage and introducing objectivity to the measured results.*
- **Unrivalled access capabilities.** *Areas which once proved challenging to monitor can now be surveyed as easily as any other, regardless of the environment.*
- **Elimination of environmental risks.** *Shortening of the time necessary for the leak detection saves the environment.*
- **Reduces the risk of injury to personnel.** *ELIS robots are fully certified.*
- **Reduces regulatory risks.** *Blockchain provides immutable records of each and every survey, thus proving client's compliance.*



ROADMAP

<i>March 2018</i>	<i>ELIS TECHNOLOGIES LIMITED established.</i>
<i>June 2018</i>	<i>ELIS Token is brought on pre-sale.</i>
<i>October 2018</i>	<i>ELIS TECHNOLOGIES LIMITED established.</i>
<i>December 2018</i>	<i>First successful autonomous field measurement in the pond with eLagoon in Israel.</i>
<i>September 2019</i>	<i>3D GPS eMapping technology is fully developed. Participation on the second largest Mining convention in the World (Perumin).</i>
<i>November 2019</i>	<i>eLagoon robot equipped with 3D GPS eMapping technology introduced.</i>
<i>November 2019 - February 2020</i>	<i>Public exchange listing of ELIS Token.</i>
<i>January 2020</i>	<i>eRaptor robot equipped with 3D GPS eMapping technology introduced.</i>
<i>February 2020</i>	<i>eRover robot equipped with 3D GPS eMapping technology introduced.</i>
<i>May 2020</i>	<i>Participation on IFAT exhibition in Munich.</i>



ABOUT ELIS TECHNOLOGIES LIMITED

ELIS TECHNOLOGIES LIMITED (ELIS) is an Irish company devoted to high-tech solutions in the realm of intelligent leak detection in tailings ponds and beyond.

Established in 2018 by a team of leak detection professionals, ELIS brought together industry experts, IT experts, academics and mechanical engineers who have been working together to revolutionise the leak detection methods used today. Thanks to successful management and 25 years of experience in the industry ELIS was able to transform the know-how and skills of its team into superb products that bring more efficiency and cost effectiveness into the realm of leak detection.

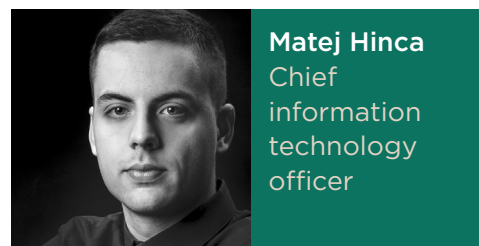
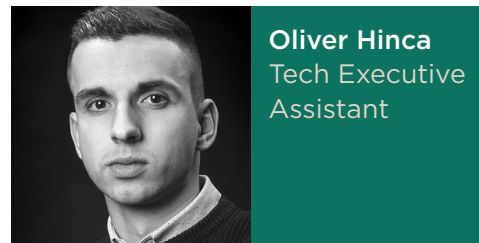
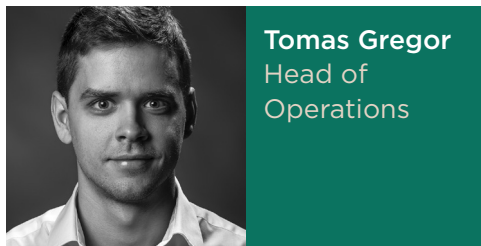
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ELIS is already present on the global market and supported by branches in Ireland, Israel, South Korea, Czech Republic and Slovakia.

Elis is actively developing new partnerships and would love to welcome you to its booth during IFAT in Munich from May 4-8, 2020



TEAM





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Peter Dalik
Chemical
Engineer



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Geophysics



Juraj Bednar
Blockchain and
Smart Contract
Advisor



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LEGAL DISCLAIMER

GENERAL DISCLAIMER

ANY INFORMATION IN THIS WHITE PAPER IS GIVEN FOR GENERAL INFORMATION PURPOSE ONLY AND ELIS TECHNOLOGIES LIMITED DOES NOT PROVIDE ANY WARRANTY AS TO THE ACCURACY AND/OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

Taking into account the lack of crypto-token regulation in the most countries, each buyer is strongly advised to carry out a legal and tax analysis before any purchase of ELIS Token in the place of the requisite tax residency.

This White Paper must not be considered as an invitation to enter into an investment. This White Paper must not be considered as an offering of securities in any jurisdiction. The White Paper does not include nor contain any information or indication that might be considered a recommendation. This White Paper does not constitute an offer or an invitation to sell shares, securities or any rights belonging to ELIS TECHNOLOGIES LIMITED or any related or associated company. The ELIS Token is a utility token, which can be used solely on the ELIS Platform, and is not intended to be used as an investment.



ELIS TOKEN

ELIS Token does **not have the legal qualification of a security**, since the token **does not** represent a voting right, equity interest, a profit sharing right, a claim to a note or other economic and/or other rights traditionally associated with a security. ELIS Token is intended solely to be used as a method of payment for the services rendered by the hardware (robots) of ELIS TECHNOLOGIES LIMITED on the ELIS Platform.

The sale of ELIS Token is final and non-refundable. ELIS Token cannot have a performance or a particular value outside the ELIS Platform. ELIS Token must not be used or purchased for speculative or investment purposes.

SOPHISTICATED KNOWLEDGE REQUIREMENT

Participation in any token sale can be highly speculative and could involve a risk of significant loss. Anyone purchasing ELIS Token must carefully review this White Paper and fully understands the risks, costs and benefits associated with the purchase of ELIS Token. The purchaser of ELIS Token must understand and have significant experience with cryptocurrencies, blockchain systems and services, and must fully understand the risks associated with ELIS Token as well as the mechanism related to the use of cryptocurrencies (including storage). ELIS TECHNOLOGIES LIMITED shall not be responsible for any loss of ELIS Token or situations when it is impossible to access ELIS Token, which may result from any actions or omissions of the user or any person undertaking to acquire ELIS Token, as well as in case of cyber-attacks. Acquiring ELIS Token and storing it involves various risks, in particular the risk that ELIS TECHNOLOGIES LIMITED may not be able to launch any/some of its operations, fully develop its blockchain and provide the promised services. Therefore, any potential buyer should carefully consider the risks, cost and benefits of acquiring ELIS Token prior to acquiring such token and if necessary obtain independent advice from blockchain professionals, accountants, tax advisors and/or lawyers. Any person who is not in the position to accept and understand the risks associated with the ELIS Token must not purchase ELIS Token.

FORWARD-LOOKING STATEMENTS DISCLAIMER

Forward looking statements are subject to risks and uncertainties which could cause actual results to differ materially from those anticipated. Such statements are based on management's beliefs and assumptions which are founded on information currently available to the management. Readers are cautioned not to place undue reliance on these forward-looking statements.

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