Tanzania Upstream Sector Activity Outlook 2023-2024

Compiled by:

OilNews Kenya

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Africa's Energy Summarized

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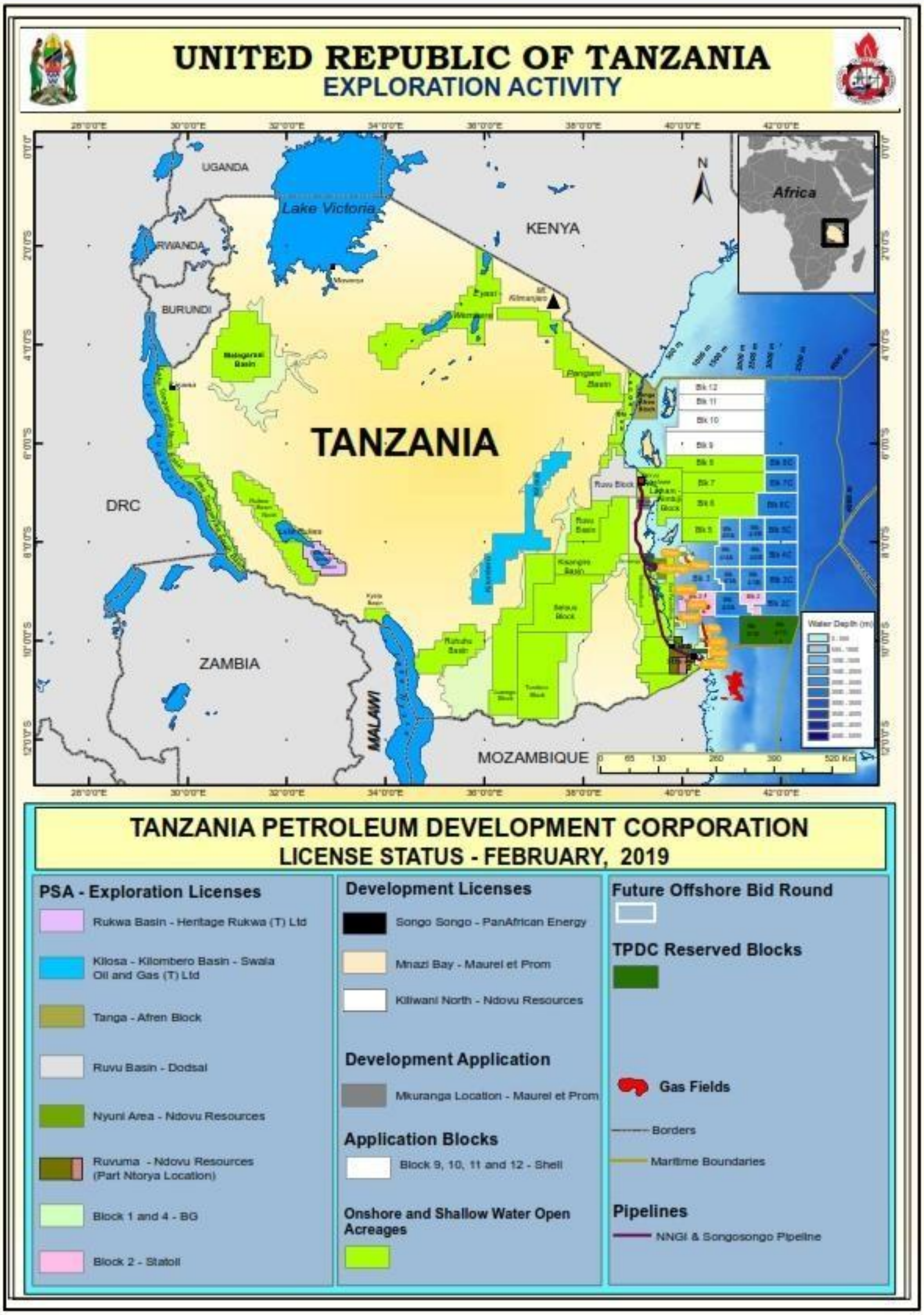
Table of Contents

Tanzania Exploration Map



Source: Tanzania Petroleum Development Company

Exploration

1. **Rukwa Basin License – Heritage Rukwa Ltd**
2. **Kilosa-Kilombero Basin License – Swala Oil and Gas (T) Ltd**
3. **Tanga Basin License – Afren/Petrodel**
4. **Ruvu Basin License – Dodsal Resources**
5. **Nyuni License – Ndovu Resources**
6. **Ruvuma Basin License – Ndovu Resources**
7. **Block 1 and 4 – BG/Shell**
8. **Block 2 – Equinor**
9. **Lake Tanganyika North License - Tanzania Petroleum Development Company**

Development License

1. **Songo Songo – PanAfrican Energy**
2. **Mnazi Bay – Maurel et Prom and Wentworth**
3. **Kiliwani North - Ndovu Resources**

Application Licenses

1. **Block 9, 10, 11 and 12 – Shell**

General Overview

Exploration in Tanzania began in the early 1950's when BP and Shell were awarded concessions along the coast. Between 1952 and 1964 (phase one) over 100 stratigraphic shallow boreholes were drilled as well as, gravity, aeromagnetic, and reflection and refraction seismic surveys. Four wells were thereafter drilled in one each on Zanzibar, Pemba, Mafia Islands and onshore in the Mandawa Salt Basin. None of the four wells encountered any significant hydrocarbon shows.

During the second exploration phase the state established the Tanzania Petroleum Development Corporation (TPDC) in 1969 and the first Production Sharing Agreement (PSA) was signed with AGIP on former BP/Shell concessions. AGIP partnered with Amoco and drilled five wells (three onshore, two offshore) including the Songo Songo discovery well in 1974. Thereafter a three well program confirmed the discovery including a blowout at the SS-2 well.

Phase three starting from 1980 to 1991 saw a surge in global oil prices that in turn encouraged further exploration in the country. It was during this period that AGIP discovered gas at the Mnazi Bay field in 1982. This period also saw Songo Songo development, drilling two wildcats at Kimbiji and several seismic programs. Amoco also drilled two wells in the rukwa basin while Shell proceeded with the drilling of Dira-1, in Mafia Channel in 1991 and thereafter relinquished the license.

Phase four starts from 1992 to 1999 during which saw little activity in the start other than fiscal and technical agreements for the development of the Songo Songo gas field between TPDC, Tanesco, and Canadian companies, Ocelot and Trans-Canada Pipelines. Interest by companies renewed in

1995 with a number of international companies acquiring exploration licenses including: Tanganyika Oil Company, Antrim, Canop and Ndovu Resources. The Tanganyika Oil Company drilled two wells in the Mandawa Basin between 1996 and 1997. During this period negotiations on the building of a power generation plant at the Mnazi Bay field were being negotiated.

Tanzania is currently on the fifth exploration phase which commenced in the year 2000 with the acquisition of an open grid 2D seismic survey by TPDC and Western Geco over the deep water areas offshore Tanzania. During this period an estimated 11,000live km of high resolution 2D seismic data was acquired. This seismic helped attract various international oil companies to the country and nine exploration blocks have currently been licensed. Following the licensing, a large amount 70,000 live km of 2D seismic data offshore, 30000 km onshore and 15,000 square km of 3D seismic data were acquired in all the blocks.

Since 2015 Tanzania has seen an increase in natural gas discovered from 55.27 Trillion Cubic Feet to 57.54 Trillion Cubic Feet in 2020 equivalent to an increase of 2.27 Trillion cubic feet. Of that amount, the amount of gas discovered on land is 10.41 Trillion cubic feet and in the deep sea it is 47.13 Trillion cubic feet. The figure is expected to rise by another 5TCF with the completion of Ruvu (2tcf), Ntorya (1.6tcf), Western Songosongo (1.3tcf) and Mnazi Bay north fields 0.3tcf. Production activities take place in two (2) blocks of Songo Songo and Mnazi Bay. The maximum level of natural gas production has increased from 95 million cubic feet per day in 2015/16 to 210 million cubic feet per day in 2019/20 equivalent to an increase of 121.05 percent. There are high-level activities related to the exploration, development and production of oil and natural gas in 11 blocks in the country through Production Sharing Agreements (PSAs)

ONSHORE BLOCKS

Lake Tanganyika South License - Tanzania Petroleum Development Company

The license is currently wholly operated by the Tanzania Petroleum Development Company (TPDC) after the withdrawal of Woodside Energy and Beach Energy in 2015 and 2016 respectively. In November 2015 the Tanzania Petroleum Development Corporation (TPDC) acquired a non-invasive Airborne Gravity Gradiometry Survey over the Block to acquire high resolution gravity and magnetic data to map subsurface structural geological framework, thickness and extent of the sedimentary rocks over Lake Tanganyika rift basin.

According to TPDC the Airborne Gravity Gradiometry Survey data is expected will assist in planning 2D seismic survey in order to identify potential areas associated with hydrocarbon deposition and subsequently identifying drilling targets.

There is however no indication that TPDC is planning to carry out seismic in the financial year 2022/23.

Results are still not in following data acquisition activities three years ago when Tanzania sought for experts from Uganda who will help gather geological and geophysical information.

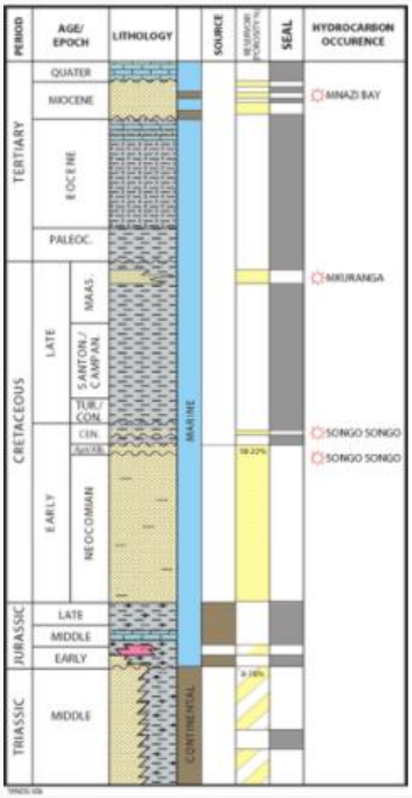
Other TPDC Reserved Block

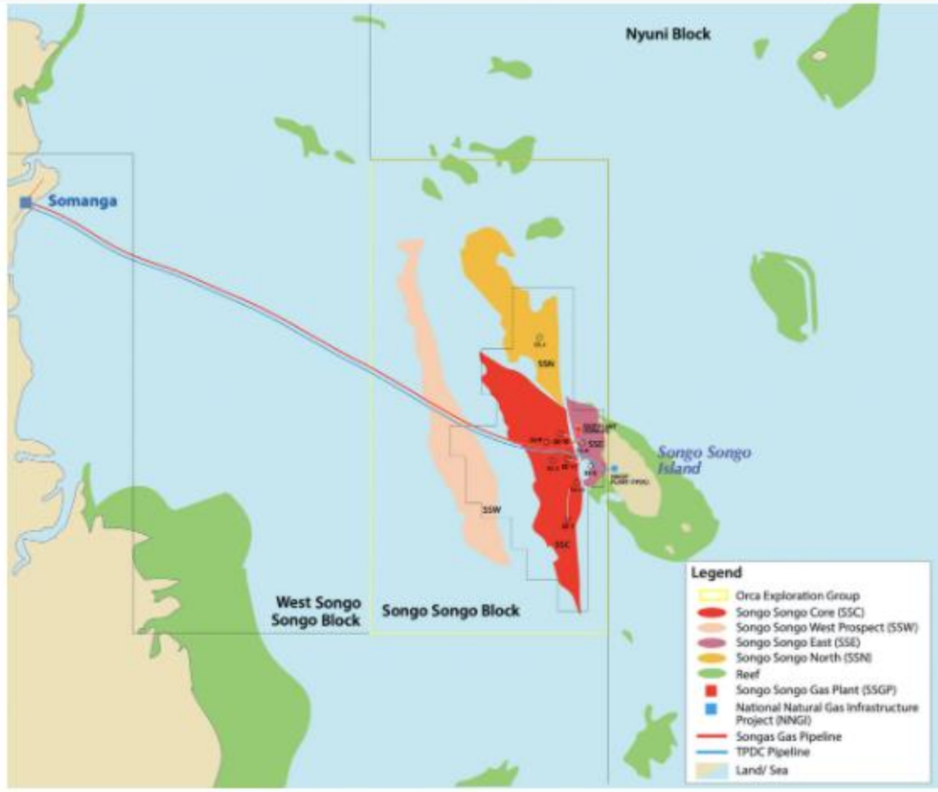
West SongoSongo License:

The West SongoSongo license has an area size of 505 km2, immediately west of producing Songo Songo Gas Field, and has estimated reserves of 1 Tcf. To date approx 235 km of 2D seismic has been undertaken in 2005. Water depths range from islands (onshore) to shallow water regions of approximately 25m. Formerly operated by Key Petroleum and Aminex plc as a joint venture partner.

In October 2018 TPDC advertised for contractors to carry out Environmental and Social Impact Assessment for 3D Seismic acquisition and Well Drilling inWest Songosongo Block.

TPDC planned to acquire and process 183.4 sq.km 3D Seismic data in West Songosongo Block with a tender notice advertised on 28th December 2018. In June 2019 TPDC advertised tenders for eligible and qualified Quality Control (QC) consultant who will work in line with Geophysical Company to make sure that the data is acquired within the agreed quality, time and in safe environment.





Source: Orca Exploration

Since 2018 TPDC carried out exploration activities in the block including integration and interpretation of AGG and seismic data to ascertain hydrocarbon prospectively.

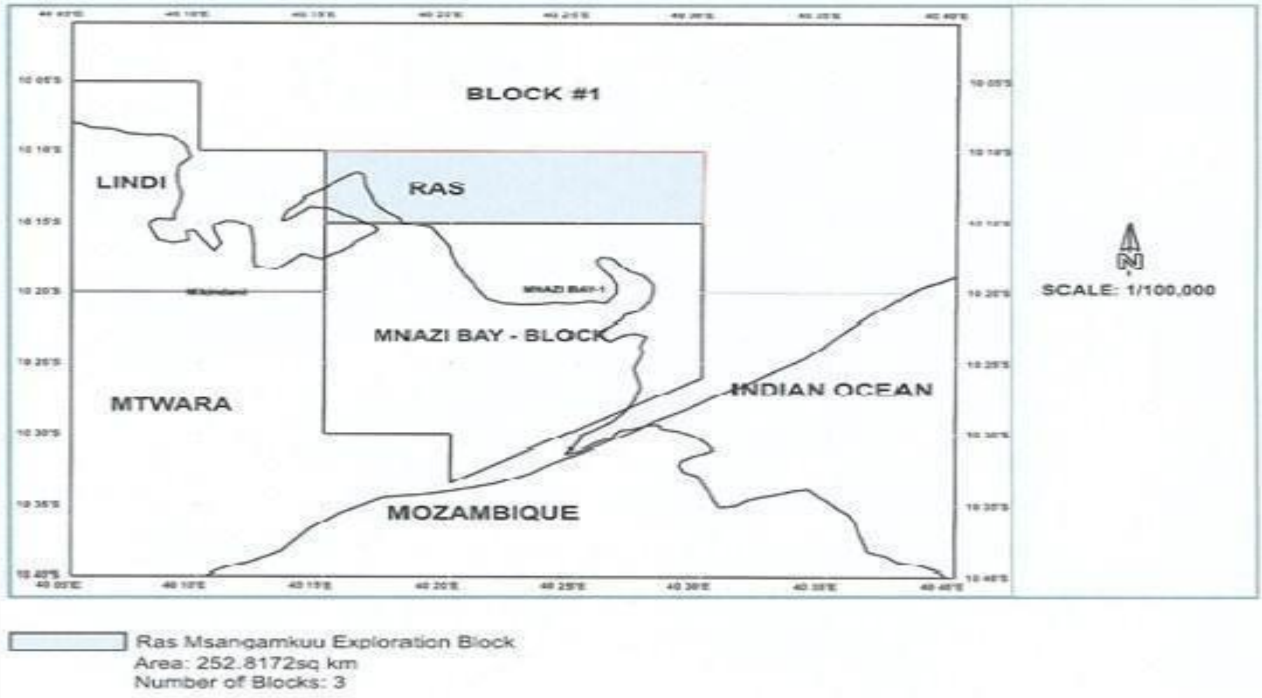
Blocks 4/1B and 4/1C

Block 4/1B has an estimated area size of 3,636 sq. Km while located in the Mafia deep offshore basin in the Indian ocean has an estimated area size of 4,190sq. Km. In 2015 acquired 4,058 km of 2D seismic, gravity and magnetic data over offshore blocks 4/1B and 4/1C in the Rovuma Delta region. This survey was to assist TPDC with a competitive farm-out process expected to commence in November. The Environmental and Social impact Assessment is already complete and submitted to the National Environmental Management Council (NEMC)

TPDC plans to acquire and process 600 sq.km of 3D seismic data in Block 4/1B in 2020 with the tendering process already complete and the selection ongoing. In June 2019 TPDC advertised tenders for eligible and qualified Quality Control (QC) consultant who will work in line with Geophysical Company to make sure that the data is acquired within the agreed quality, time and in safe environment.

As of mid-2021, TPDC had completed preliminary evaluation of geological and geophysical data and solicitation of drill management consultant.

Mnazi Bay North



Source: Hydrotanz Limited

The TPDC operated Mnazi Bay North Block is positioned between the producing Mnazi Bay field operated by the Artumas/Maurel & Prom Group and the Ophir/BG Offshore Block 1 which has very significant gas discoveries. There is an existing 2D data and was estimated to have recoverable reserves of at least 600 billion cubic feet (BCF) – 1 TCF of gas in the field. Mnazi Bay North license is located in an essentially undrilled Tertiary deltaic system, especially a deltaic system with a proven petroleum system. The block was initially held by Hydrotanz in May 2008

In October 2018 TPDC advertised for contractors to carry out Environmental and Social Impact Assessment for 3D Seismic acquisition and Well Drilling in Mnazi Bay North Block.
In May 2019 TPDC then advertised for tenders for the Acquisition and Processing of 3D Seismic Data in 4/1B and Mnazi Bay North Blocks located in offshore Tanzania. The exercise targets 93.1 sq.km of 3D seismic data in Mnazi Bay North Block, and s 600 sq.km of 3D seismic data in Block 4/1B. The tender process closed in September 2019 and a winner will be announced once shortlisting of qualifying candidates has been completed. Acquisition of the seismic is expected in 2020.

TPDC advertised tenders for eligible and qualified Quality Control (QC) consultant who will work in line with Geophysical Company to make sure that the data is acquired within the agreed quality, time and in safe environment.

TPDC has also advertised for tenders for Provision of Consultancy Services for Carrying out Preparation for Exploration Well Drilling in Mnazi Bay North with funds for the operation having been set aside during the financial year 2018/19. The scope of the assignment included: review existing Geological and Geophysical data interpretations and prepare Geological well program, review existing well plan and prepare Drilling Program and Advisory on drilling preparation including procurement of long lead item as well as monitoring of drilling operations.

The work implemented in 2019/20 includes the completion of the evaluation of geological and physiological information and the acquisition of a Drilling Management Consultant. In 2020/21, the work to be done included drilling exploration and exploration wells and finalizing a draft Agreement between the Government and TPDC on the exploration and development of oil and natural gas in the Mnazi Bay North Nursery. In May 2020 the Minister of Energy Dr Medard Kalemani announced in Parliament that his ministry had allocated USD $44M to facilitate the Tanzania Petroleum Development Corporation (TPDC) drill two exploration wells at the Mnazi Bay north-fields.

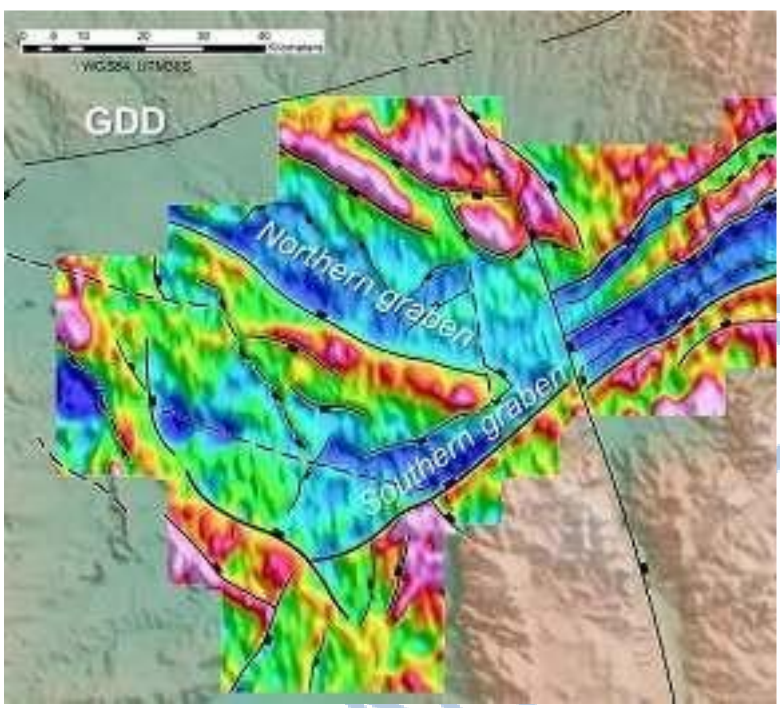
As of mid-2021, TPDC has completed preliminary evaluation of geological and geophysical data and solicitation of drill management consultant.

Eyasi Wembere License

The Eyasi Wembere is located in the northern eastern part of the country and covers Lakes Eyasi, Wembere, Natron and Manyara and is part of the East African Rift System and is subdivided into Eyasi, Manonga and Wembere sub basins. The licence despite being geographically mapped has no seismic surveys or wells drilled to date and thus only potential fields data from arising from a recent aerial survey as well as existing countrywide magnetic and gamma-ray spectrometry survey data.

A paper by CGG and TPDC in September 2017 indicated that the Western and Central sub- basins of Eyasi Basin provide the best opportunity for thick sediments, extensive reservoir facies, and proximity to a hydrocarbon kitchen. It is estimated that the depth to the basement in these sub- basins imply the sediment accumulations might be as thick as 5 kilometers and are therefore identified as prospective areas for hydrocarbon exploration. The basin is analogous to the Lokichar basin in Kenya and lacks a macro hydrocarbon seep.

The Natron and Manyara basins appear to have lower sediment thickness than the Eyasi Basin and fewer structures that seem favorable for the development and trapping of hydrocarbons. The block is strategically located and an oil discovery would easily connect to the East Africa Crude Oil Pipeline running from Hoima to Tanga.

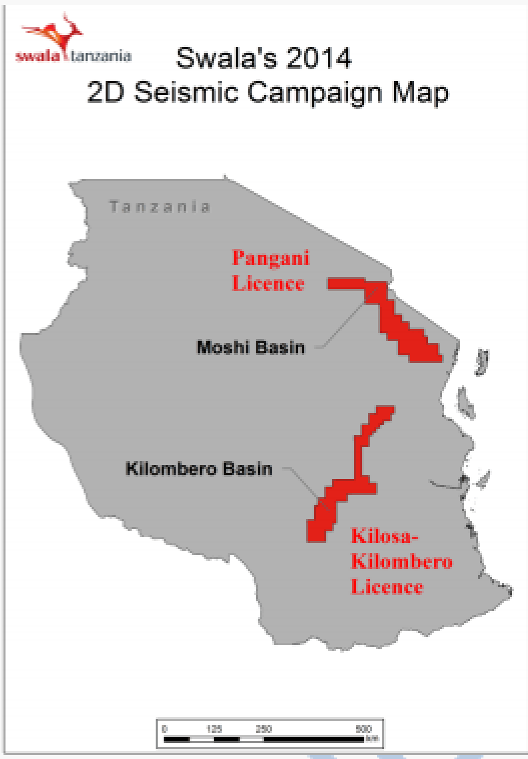


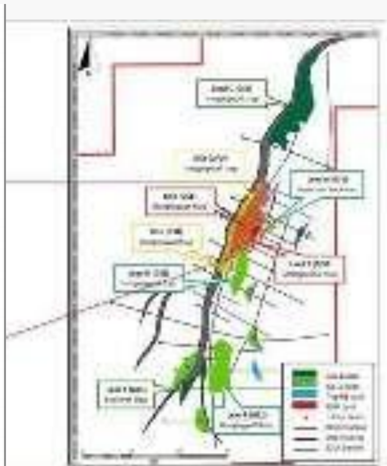
In October 2017 Tanzania sought for experts from Uganda who will help gather geological and geophysical information. Technicians from the Tanzania Ministry of Energy and Minerals, Tanzania Petroleum Development Corporation and Petroleum Upstream Regulatory Authority and Ugandan experts have since October 2017 toured the Eyasi Wembere basin and Sekenke hills.

TPDC and the State Mining Corporation (Stamico) completed drilling of two shallow exploration wells at Igunga and Nyaranja- Meatu on the Eyasi-Wembere fields during the ending financial year 2019/2020. The ministry further committed a further 500m/- extra to drill another shallow exploration well in Luono in Singida region this year, conduct a 3D airborne gravity gradiometry- AGG as well as an environmental impact assessment survey. Sourcing a strategic partner for carrying out hydrocarbon exploration including 150km 2D seismic in Eyasi Wembere has been ongoing with TPDC advertised for Consultancy Services for Quality Control for Acquisition and Processing of 2D Seismic data in Eyasi Wembere Block in Q4 2021.

In July 2022 Tanzania reported that it had struck substantial oil deposits in the Wembere-Eyasi basin. TPDC said that the drilled wells were observed to contain rich contents of hydrocarbon resources—which indicate the presence of oil deposits.

Kilosa-Kilombero Basin License - Swala Oil and Gas (T) Ltd





Kilosa Kilombero license is to date been operated by Swala Oil with several JV partners including: Otto Energy, Tata Petrodyne Limited (TPL), Vegas Oil & Gas Limited, (Vegas) and Motor Oil Hellas SA (MOH) coming together as MV Upstream Tanzania Limited. Tata Petrodyne Limited has been asked by the operator to withdrawal in December 2019 To date 420km lines of 2D seismic have been acquired in 2014 which identified a series of structural leads on the western margin of the basin with the geometry of this „string of pearls' strongly analogous to that seen elsewhere in the East African Rift System, notably in the Lokichar Basin of Northern Kenya.

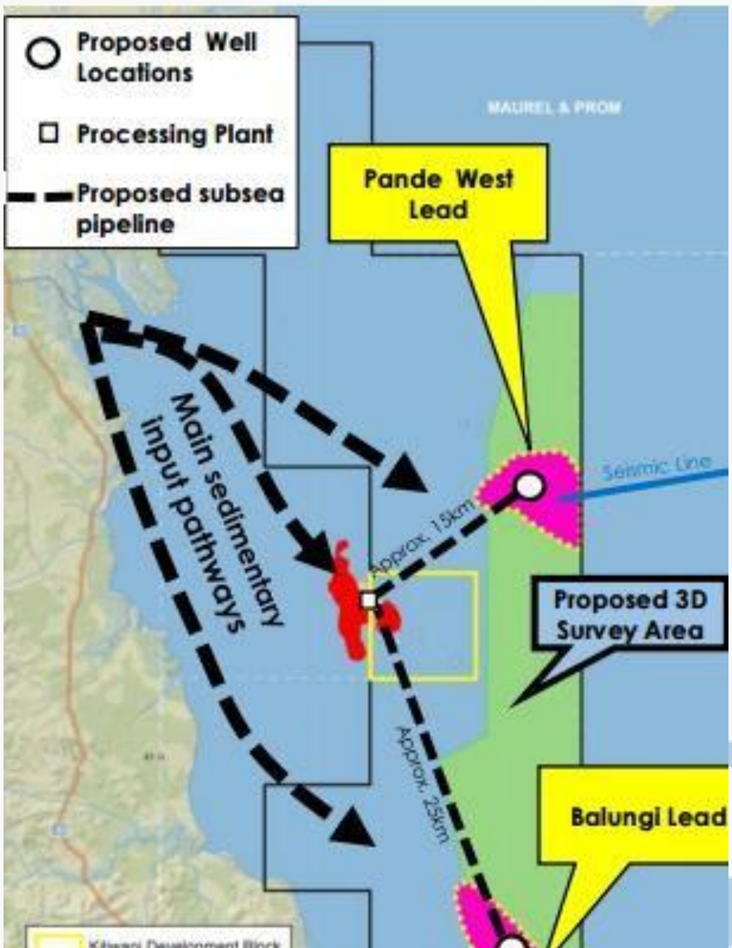
The Company had already identified the Kito Prospect, and was expected to drill in q4 2017 with all the licenses having been acquired. A dispute with the Tanzania Petroleum Development Corporation ("TPDC") and the Tanzania Wildlife Authority ("TAWA") prevented the explorer from drilling in 2018 after it was denied a drilling permit. In April 2018 Swala Oil & Gas declared Force Majeure under the Kilosa-Kilombero Production Sharing Agreement until it entered into an MoU with the two authorities on 20th November 2018 after completing its obligations with TAWA obliged to issue the Company with all necessary permits to access the Kito-1 drilling site in 2019 as soon as reasonably practical.

In May 2019 the operator issued a second Force Majeure under the Kilosa-Kilombero Production Sharing Agreement that holds to date.

Swala has been working with TPDC to resolve the mechanics of the transfer of the equity in Kilosa-

Kilombero formerly held by IPL to Swala following the dispute with Invenire Petrodyne Limited (IPL, formerly Tata Petrodyne Limited) with Swala requiring IPL to withdraw from the Joint Operating Agreement and the Production Sharing Agreement for the Kilosa-Kilombero licence.
Swala has submitted a request for arbitration to the International Chamber of Commerce.

In September 2021 the operator announced a licence extension, valid for two years from the 18th of August 2021 which allows the company to refresh the Environmental Impact Assessment first completed for operations in 2016 and which has a validity of five years, refresh the rig evaluation and selection studies to include rig-sharing or shallower rigs from neighbouring jurisdictions, secure all necessary permits including those from the Tanzanian Wildlife Authority, Tanroads and the Rufiji Water Board and drill one exploration well targeting the Kito prospect.



Nyuni License

Aminex operates the 840km2 Nyuni Area PSA through its wholly owned subsidiary Ndovu Resources Limited located in the offshore regions surrounding the Kiliwani North Development Licence. The block lies updip from the large Chewa and Pweza deep water discoveries where two main clastic plays across this area, the Neocomian sandstone analogous to the Songo Songo and Kiliwani North field, and the deeper water fan plays deposited throughout the Cretaceous and Tertiary. The water depth in the licence ranges from 10-700m.

To date two wells have been drilled in the license the Nyuni 1 and Nyuni 2 wells in 2004 and 2011 respectively with the first well encountering oil and gas shows in the Lower Cretaceous while the latter only had gas shows.

In 2017 Aminex announced plans for a new 3D seismic programme to be prepared based on the licence area post relinquishment. According to the operator the company would re-tender based on the new programme in order to select a 3D seismic contractor capable of acquiring high quality 3D seismic over the key Pande West lead.

The 3D seismic is over Pande West analogous to some of the recent major deep-water discoveries in the vicinity is hoped to identify other potential prospects in the deep water with a view to bringing them to drill-ready status.

In 2018 Aminex had announced it was considering the potential to combine seismic programmes with Kiliwani North in order to spread costs between the two licenses. In 2019 the company prioritized on its farm-out process to ARA Petroleum Tanzania Limited and was not able to complete the planned activities until the licensed expired in October 2019.

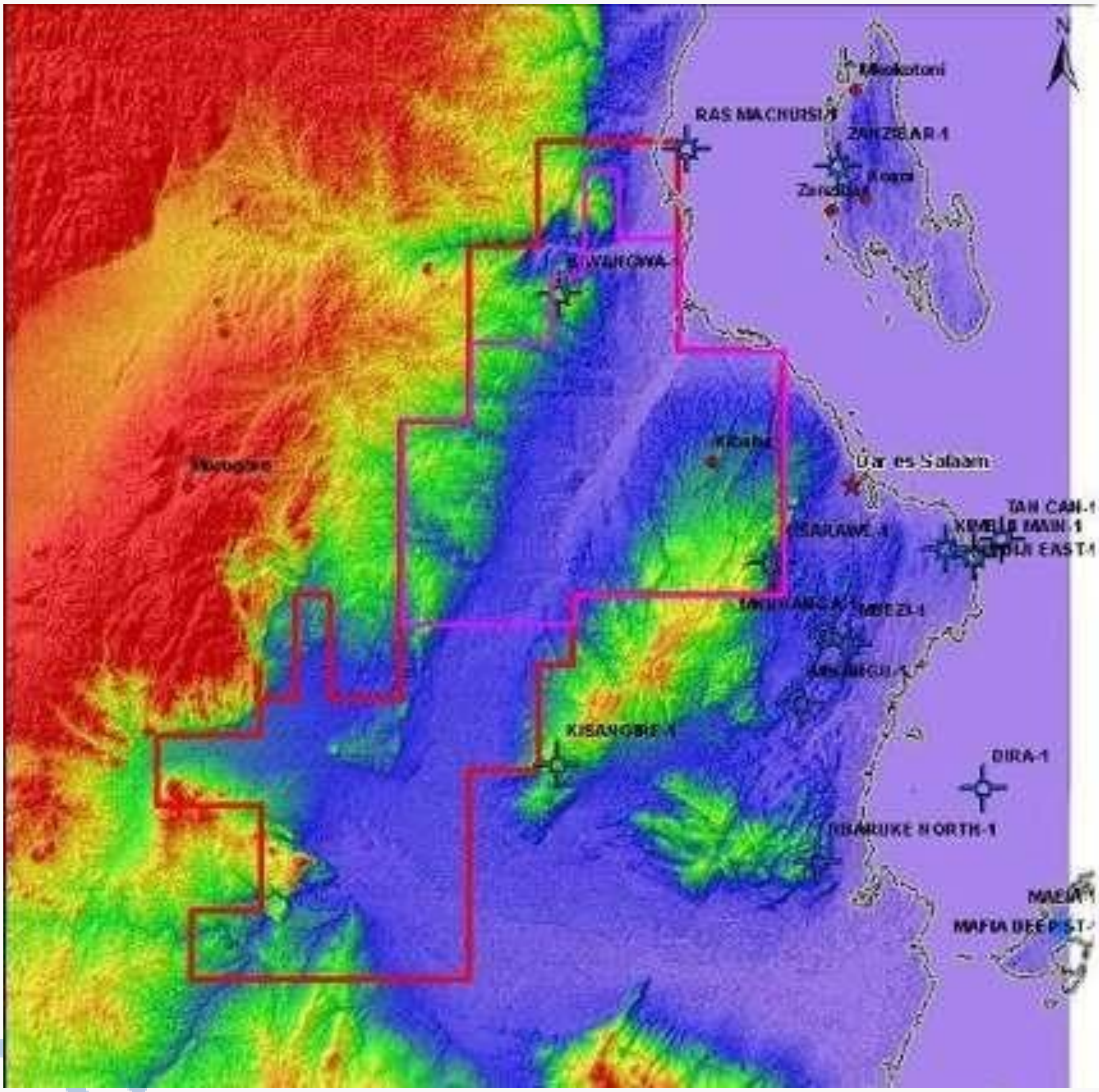
The Company has applied for a 3-year extension of the Nyuni Area PSA with a revised work programme. If successful, it is expected that the number of blocks retained under the licence will reduce to five, from the current ten blocks under licence. The proposed acreage to be retained generally lies in the shallow water areas adjacent to the Kiliwani North Development Licence which will require the acquisition of 3D seismic to move shallow water targets to drill ready status. Aminex has said remains optimistic that the proposed extension and work programme will be accepted and approved in the near future

Aminex operates with a 93.3333% working interest through its wholly owned subsidiary Ndovu Resources Limited.

Ruvu Basin License – Dodsal Resources

The Ruvu Basin license is operated by Dodsal Hydrocarbons and Power (Tanzania) Pvt. Ltd., a wholly owned subsidiary of Dodsal Resources since signing of the Production Sharing Agreement with the Government of Tanzania on October 23, 2007, acquiring possession of an on-shore Oil and Gas Concession 30kms West of Dar es Salaam in Tanzania, with an area of more than 15,000 sq. km.

To date the company has acquired 2D seismic on the block which indicated presence of hydrocarbons, with re-interpretation conducted at leading technology centers in Canada, USA, Italy, Germany and UK.



The company has also drilled three wells encountering some of the biggest onshore gas discoveries in Tanzania.

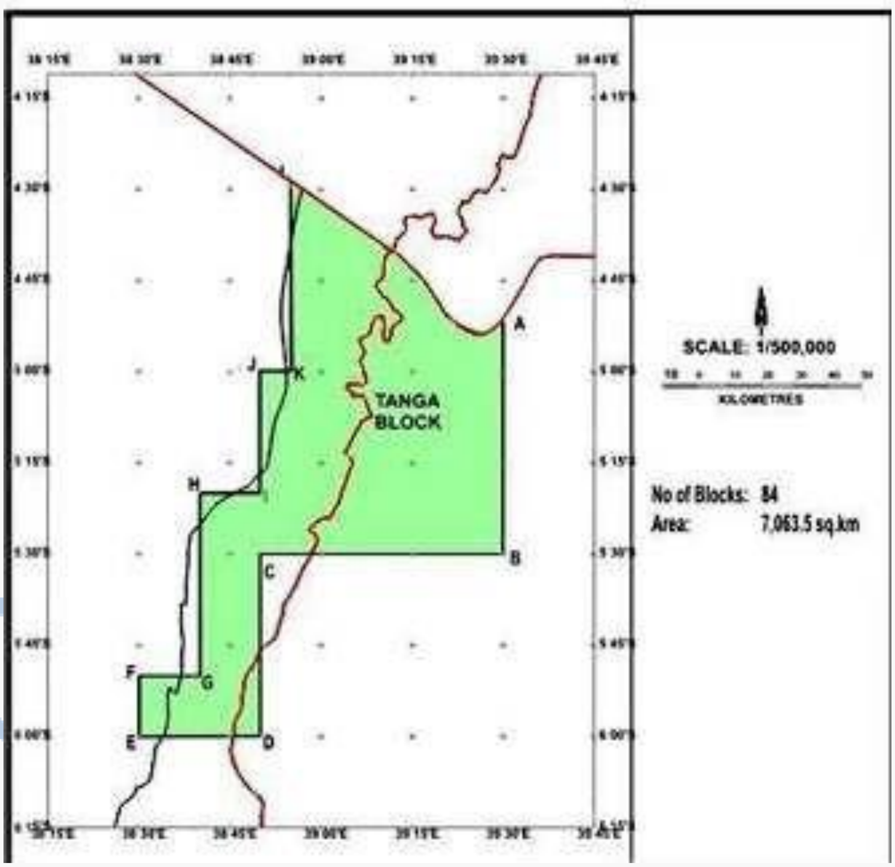
The company last year announced a discovery of over 2.7 TCF natural gas deposits on the block in addition to other discoveries in Tanzania's Mambakofi and Mtini region.

In 2017 Dodsal said it would to invest US$300 million in Tanzania over the next 24 months to support its exploration and production activities, including implementation of an Early Production System to bring discovered gas to the market.

in 2021 Dodsal had indicated it would commence its campaign with the aim to materially establish volumes of actual commercial gas in place and thereafter prepare ready for production of the first gas.

Tanga Basin License – Afren/Petrodel

The Tanga Block lies northernmost coastal Tanzaniaand includes onshore, shallow marine and deep marine areas and is covered by 200 km of legacy 2D seismic data, and 1,200 km of good quality new 2D seismic data covering mainly the deeper water area, acquired by Petrodel.



The Tanga Block is well located as it includes a deep basin with a very thick sedimentary section that has the potential to host several source rock intervals and reservoir/seal pairings. Potential petroleum plays recognised to date are Lower Cretaceous sands deposited in deltaic to shallow marine environments, Upper Cretaceous submarine fans, Eocene shelf sands and Miocene fluvial and deltaic sands. There are structures, particularly along the western flank of the basin, which are interpreted to form viable traps. Some of these lie in shallow water and could present relatively inexpensive drilling targets.

The Tanga Block is also a possible source of charge into the southern parts of adjacent Kenya block L18. Oil seeps and shows encountered in previous wells drilled on the nearby Pemba Island attest to the oil potential of the block and surrounding area.

To date 10 years of work in the license has established multiple offshore targets including 6 prospects defined by seismic. The license is pending government approval since transfer from former operator Afren to Octant Energy.

Prospect	P90 (mboe)	PMean (mboe)	P10 (mboe)
Nanasi	16,228	95,391	209,271
Nanasi Wedge	5,5335	29, 103	64,030
Mkonge	16,051	136,100	310,191
Chungwa	14,140	115,959	263,185
Chungwa W	7,434	58,872	138,539
Hercules	14,561	112,656	353,577
Total	**207,727**	**548,082**	**1,237,794**

Source: McDaniel & Associates Consultants Ltd

The gross prospective oil resource in the four identified prospects Orpheus, Calliope, Hercules is estimated to be 1.3 billion barrels.

RUVUMA PSA – ARA PETROLEUM

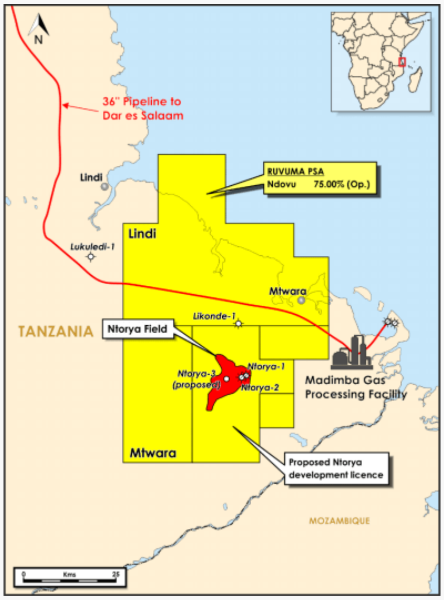
The 3,447 km2 Ruvuma PSA is located in southern Tanzania within the highly prolific Ruvuma
Basin where it has reported that more than 160 TCF* of gas has been discovered in recent years.
To date the block has witnessed two commercial gas discoveries at Ntorya 1 (25M Gross Reservoir) and Ntorya 2 (51M Gross Reservoir) with the former having reached a total depth of 3150MD and tested gas flowing at 20MMcf/d and 139 Bbls condensate while the latter which tested gas flowing at 17MMcf/d.

In 2019 Aminex planned to spud the Chikumbi-1 well (formerly Ntorya-3) in Tanzania a well planned to drill to a total depth (TD) of approximately 3,000m and has already awarded the drilling contract to Sakson drilling. Chikumbi-1 is to be drilled in a stratigraphic feature similar to that encountered at Ntorya 1 and Ntorya 2, but further structural up-dip of the two discovery wells.

Aminex had signed a conditional rig sharing agreement with Heritage Oil Limited in Tanzania in order to reduce mobilisation/ demobilisation costs for both parties. A 1-year licence extension was also received during April 2020, which reduced the size of the Mtwara licence to the same area as the Ntorya location area. Further 2-year licence extensions has been granted to acquire 200 sqkm of 3D seismic data, drilling of the Chikumbi-1 well and conclusion of negotiations of the Gas Terms for the Ruvuma PSA

Following completion of the Farm-out in October 2020, Aminex is fully carried through to production, which will include the drilling of multiple wells, seismic acquisition and construction of associated infrastructure. The Farm-Out included a full carry for a minimum work programme including the drilling and testing of the Chikumbi-1 well, the acquisition of 200 square kilometres (surface coverage) 3D seismic over a minimum of 200 km2 within the Ntorya area, and further production wells and infrastructure as required to propel the project to its estimated P50 production level of approximately 140 MMcf/d.

Gross contingent of $40 million has been set for the drilling of Chikumbi-1. ARA Petroleum Tanzania Limited has agreed to fast-track select Chikumbi-1 pre-drilling activities and has appointed a management team to oversee Tanzanian operations. The work programme and budget for 2021/2022 anticipates a gross JV expenditure of approximately $25 million and is expected to see the acquisition of the 3D seismic, pre-spud activities for the Chikumbi-1 well, negotiations of the commercial terms for the development licence. Seismic acquisition by Africa Geophysical Services commenced in mid-November and seismic was completed on 9th October 2022. APT now plans to spud the Chikumbi-1 well in Q1 2023. Currently, APT and the Tanzania Petroleum Development Corporation (TPDC) are in advanced negotiations to accelerate gas production from the Ntorya gasfield. The proposal, following the successful drilling of CH-1, is to utilise the newly drilled well and the existing suspended gas producers, Ntorya-1 (NT-1) and Ntorya-2 (“NT-2”). This is expected to lead to gas production and receipt of production revenues in early 2024, almost 12 months earlier



than originally envisaged. The acceleration of production through the initial three wells is strongly supported by the Tanzanian authorities and is based on the following:

- Commitment by the TPDC to construct a 30 km pipeline as soon as possible to tie the Ntorya gas field into the existing Madimba processing and pumping station.
- The incorporation of three producing wells – CH-1, NT-2 and NT-1, the latter of which will be worked-over after the drilling of CH-1 to repair a minor leak in the casing string.
- The three wells are expected to produce at least 60 mmscfd in aggregate.
- The estimated gross capital budget for 2023, which has been approved by the joint venture partners, is US$30.8 million, includes the processing and interpretation of the 3D seismic data, drilling and testing of CH-1, re-entry and work-over of NT-1, together with the purchase of the necessary manifold, flowlines, fiscal meters and hook-up system to facilitate early production. Early production success, from the initial three well development, will see the drilling of up to five additional development wells taking the expected field gas production to rates in excess of 140 mmscfd.

Negotiations continue regarding the finalisation of gas terms and gas pricing.

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Development Plan

Aminex submitted a Development Plan for the Ntorya field, located onshore in the Ruvuma Basin, Tanzania in November 2017 and is awaiting approval from the Tanzania Petroleum Development Corporation (TPDC). The Development Plan is a key step towards obtaining a development licence and the commercializing of the resources from the Ntorya appraisal area which sits within the Ruvuma Basin.

The Plan takes into account several options for gas monetisation including Compressed Natural Gas, Gas to Power and directly connecting the gas produced from the Ntorya field to the Madimba Plant in South Eastern Tanzania via an approximately 35 km spur line. The Company has applied for a staged development of the field to allow for an early production system with existing wells and a programme that drills further development wells based on demand.

Upon success at Chikumbi 1 the company envisages an Early Production System (EPS) at the well and some remediation work at Ntorya 1 and Ntorya 2.
On 25 November 2022, at the Tanzania Petroleum Development Corporation (TPDC) headquarters in Dar es Salaam, the parties to the Ruvuma PSA signed an addendum to the PSA. The Ruvuma PSA, as with all other PSAs in Tanzania, contained profit share, royalty, and taxation rates only for oil production. The PSA Addendum sets out the relevant terms for gas production.

- Develop additional gas resources as soon as possible;
- Accelerate Ruvuma's production, which will play a vital role in achieving the country's short to medium-term gas needs; and

Construct a 30 km pipeline to tie the Ntorya gasfield into the existing Madimba processing and pumping station in the next six to nine months. The Final Investment Decision (FID) is targeted for 2023 with the first gas expected in late 2024 with a target production rate of up to 140 MMscf/d.

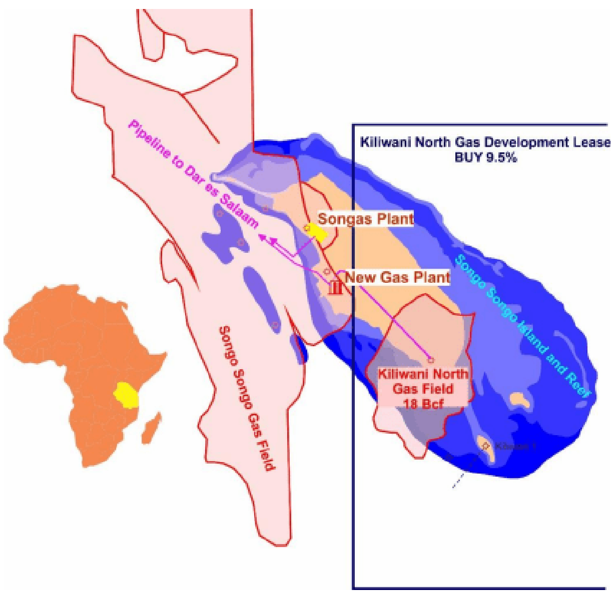
ARA Petroleum Tanzania Limited is the operator with 50% working interest while Aminex 25% working interest through its wholly owned subsidiary Ndovu Resources Limited.

Kiliwani North Development Licence

The Kiliwani North Development License has a production license which expires in 2036 with the existing gas sales agreement and gas plant with capacity to tie in new wells.

As a result of reservoir pressure decline and compartmentalisation, the Kiliwani North-1 well has not produced during the period. The KN-1 well estimated to contain approximately 10 BCF has produced approximately 6.5 BCF of gas to date. Estimated gas resources have been independently audited by RPS, who show the Kiliwani North structure to contain approximately 31 BCF.

In 2018 Aminex undertook preliminary remedial work to repair the downhole safety valve resulting in the flow of a small volume of gas shortly before well quickly ceased flow. According to Aminex the ceasing is likely due to fluid buildup in the wellbore and the JV has prepared a perforation strategy for a lower zone within the reservoir and an alternative remedial work programme intended to establish fluid levels in the wellbore, reservoir pressure and to unload potential fluid using foam treatment. The JV is working with TPDC on agreed methods to handle wellbore fluids which will potentially be unloaded during operations on the well.



OFFSHORE BLOCKS

Block 1 -BG/ Shell

Tanzania's block 1 is operated by BG Group which was acquired by Shell alongside Pavillion Energy Resources and MedcoEnergi. BG Group acquired the Tanzania offshore block in 2010 when it farmed in to Ophir Energy now MedcoEnergi acquiring a 60 per cent working interest. Ophir sold a further 20% to Pavilion Energy in 2014 for $1.3 billion.

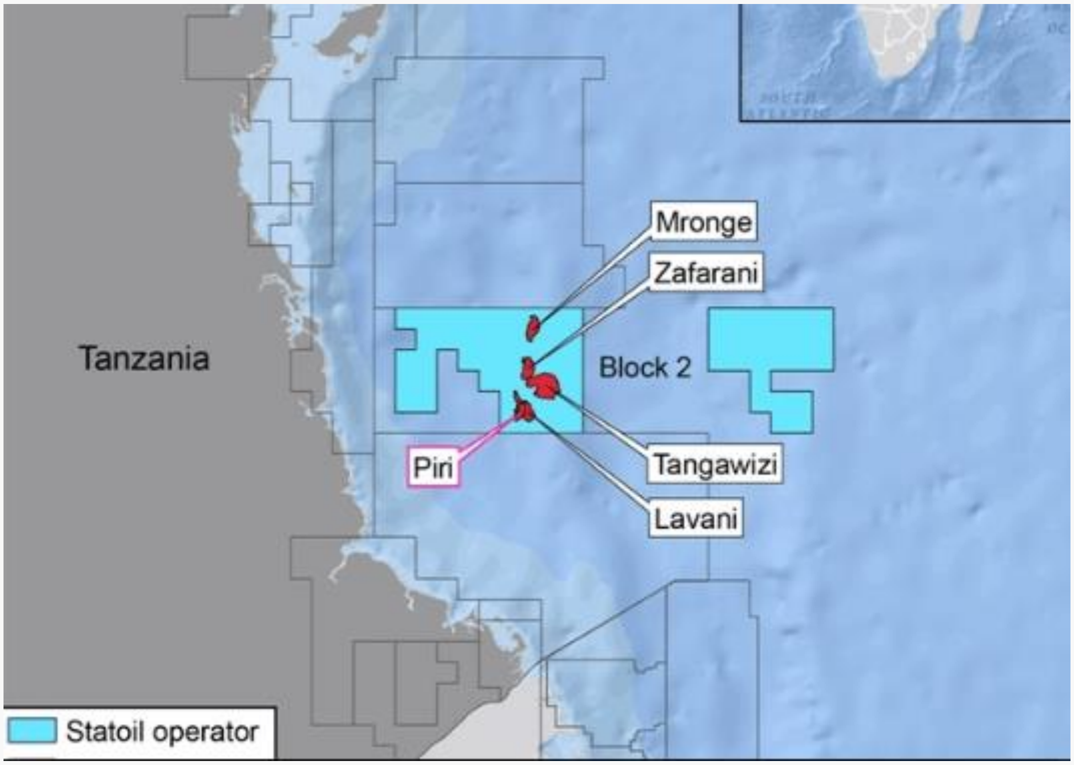
To date there have been five discoveries in block 1 namely Chaza, Jodari, Mzia, Taachi and Mkizi with estimated mean recoverable resources from the five wells estimated at over 10Tcf. Currently the new operator Shell has received an extension for a further three and a half years to provide sufficient time to complete pre-FEED and FEED ahead of investment approval.

Block 2 partners and the Government have signed a MoU for the project including the site of the LNG plant and the process for acquiring the land and for how any resettlement will be managed. The joint venture partners had already completed the final exploration commitment well on Blocks 1 the unsuccessful Kitatange-1 well drilled in Q4 2017.

The project remains in the pre-FEED stage and is expected to enter into FEED following the completion of the LNG site acquisition, the geotechnical investigations and engineering studies. In parallel, the concept selection for the upstream part of the project which will determine the configuration and production rates from each of the fields.

The Petroleum Upstream Regulatory Authority (PURA) has kick-started a string of meetings with petroleum exploration and production companies operating in the country aimed at discussing companies' work plans and budgets for 2022. In June 2022 Tanzania signed the initial Host Government Agreement (HGA) with global energy majors Shell, ExxonMobil, Equinor and Ophir for the country's $30 billion liquefied natural gas (LNG) project. The agreement, which defines the fiscal, legal and commercial terms for the onshore components of the project, kickstarts negotiations for the development that will see Tanzania unlock its over 57 trillion cubic feet of gas reserves.

Block 2



Block 2 is operated by Statoil/Equinor which signed a production sharing agreement (PSA) for block 2 with Tanzania Petroleum Corporation (TPDC) in 2007. Statoil Tanzania AS is the operator with 65% working interest, with ExxonMobil Exploration and Production Limited as a partner with 35% interest.

The block covers an area of approximately 5500 square kilometers and lies in water depths ranging from 1,500 and 3,000 metres. There have been seven discoveries to date namely Zafarani, Lavani, Tangawizi and Mronge discoveries in 2013, Piri and Giligiliani discoveries in 2014 and Mdalasini discovery in 2015. These discoveries have proven a combined in-place volume of around 22 trillion cubic feet.

After a two year lack of drilling activity in the block Equinor drilled the successful pilipili well in Q1 2018.

In 2019 Equinor planned to start the environmental and geotechnical surveys on the site in Lindi even as the Government and the Block 2 partners continued negotiations on the commercial framework for the project, the HGA (Host Government Agreement) key terms.

According to operator Equinor the block will require at least 3 years of planning and engineering work with (pre-FEED and FEED) being carried out during this period to guarantee there is sufficient technical definition and preparation for the construction phase to be completed efficiently within the schedule and the cost estimated. Thereafter construction of a plant is expected to take 4 to 5 years and after start-up production is expected to last for more than 30 years.

Block 2 partners and the Government have already signed a MoU for the project including the site of the LNG plant and the process for acquiring the land and for how any resettlement will be managed.

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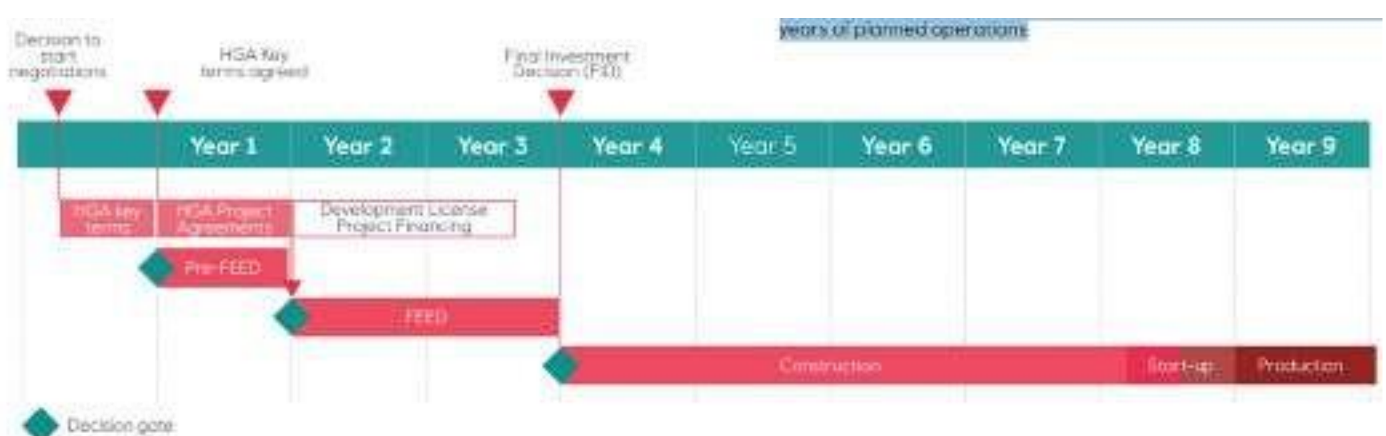
Initial plans is for the gas to flow up through wellheads and then through hundreds of kilometers of subsea pipelines on the ocean floor up the continental shelf then on to show. Decision to proceed with come after heads of terms are agreed with Tanzania with the construction expected to take five years.



Source: Equinor

In 2021 Equinor decided to write-off the book value of its Tanzania LNG project (TLNG) on the company's balance sheet by 982million USD citing lack of progress in overall project economics despite progress on the commercial framework. According to Equinor despite the TLNG project has an anticipated breakeven price well above the portfolio average for Equinor it was not competitive. Equinor adds it will continue to engage with the Government of Tanzania in negotiations on a commercial, fiscal and legal framework that may provide a viable business case for TLNG in the future.

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Block 4

Tanzania's block 4 is operated by BG Group which was acquired by Shell alongside Pavillion Energy Resources and Ophir Energy. BG Group acquired the Tanzania offshore block in 2010 when it farmed in to Ophir Energy acquiring a 60 per cent working interest. Ophir sold a further 20% to Pavilion Energy in 2014 for $1.3 billion.

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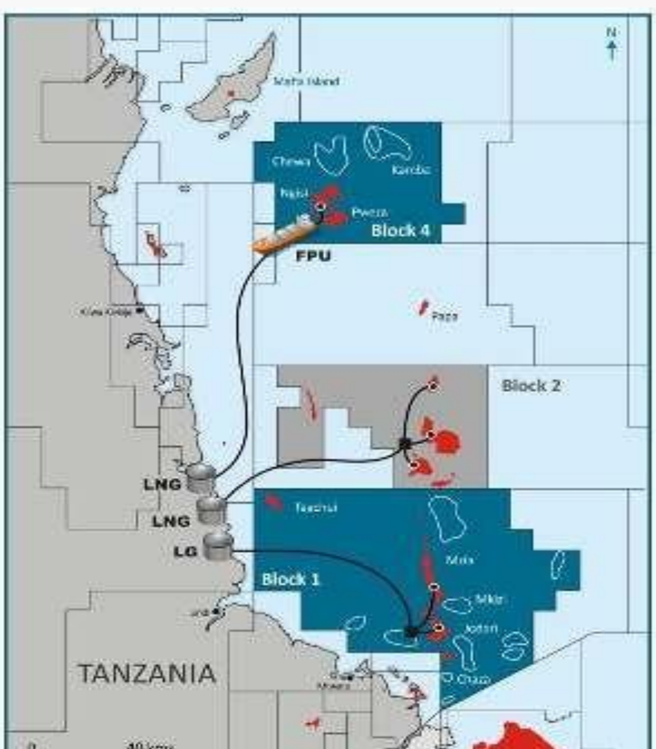

Block 4 is located in the Mafia Deep Basin off-shore from the Rovuma and Rufiji deltas with water depths ranging from 100 to 3,000 metres. To date there have been three discoveries and two successful appraisal wells in Block 3 including: Chewa-1, Ngisi-1, Pweza-1, Pweza- 2 and Pweza-3.

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Development License

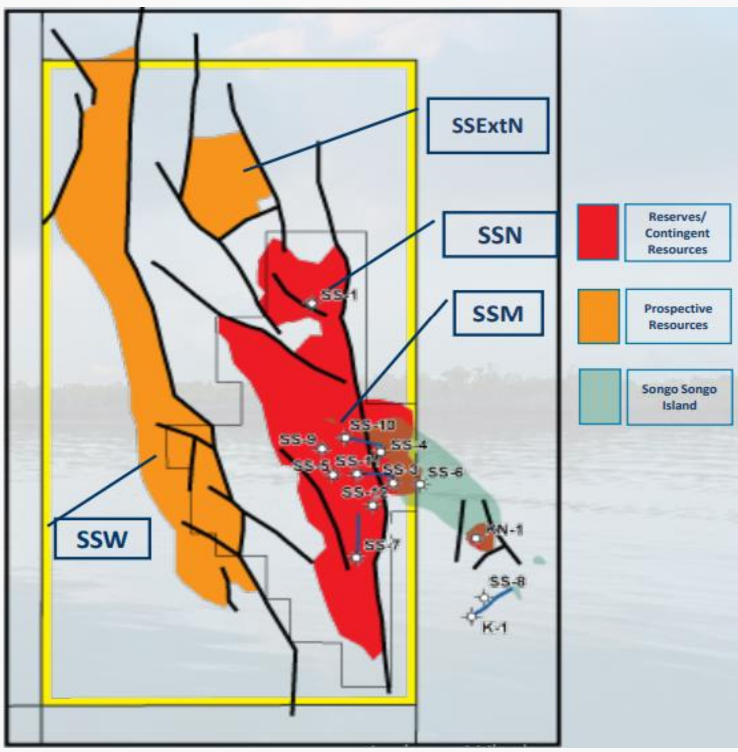
Songo Songo - Orca Energy

The SongoSongo license has a total area of approximately 41,630 acres (170 km2 and is located located in shallow water approximately 15 kilometres off the coast and 200 kilometres south of Dar es Salaam. The license contains the large Songo Songo gas field which is positioned on and slightly offshore Songo Songo Island. The main reservoir is developed in Lower Cretaceous aged Neocomian to Albian sandstones (Neocomian), while Upper Cretaceous aged Cenomanian sands that lie unconformably on the Lower Cretaceous provide additional reservoir when developed.

Gas was discovered in the SongoSongo license in 1974 by AGIP and AMOCO who drilled four wells in total to appraise the discovery. It is now estimated that the gas field holds 879Bcf with 195 Bcf is allocated for use by Songas Limited and 684 Bcf is produced, marketed and sold by Orca Exploration which operates under its subsidiary PanAfrican Energy and Swala Oil and Gas which in 2019 become a shareholder of PAE PanAfrican Energy Corporation.

Gas production in SongoSongo began in 2004 with a 70 MMcfd infrastructure limit until it was increased to 90 MMscfd following certification of the increased rate by Lloyds Register. Currently the plant is operating at 110 MMcfd until the announced Songas Expansion Project is operational as to when PanAfrican Energy expects to be ready to deliver up to 200 MMcfd PanAfrican Energy expects to be ready to deliver up to 200 MMcfd.

Whereas PanAfrican Energy Tanzania is the operator of the Songo Songo gas wells while Songas Ltd, the owner of the gas processing plant and related infrastructure. The infrastructure includes two gas processing trains each rated at 35 MMscfd (70 MMscfd total); a high pressure 25-kilometre 12″ offshore pipeline and a 207-kilometre 16″ onshore pipeline. Songas operates the high pressure pipeline system.



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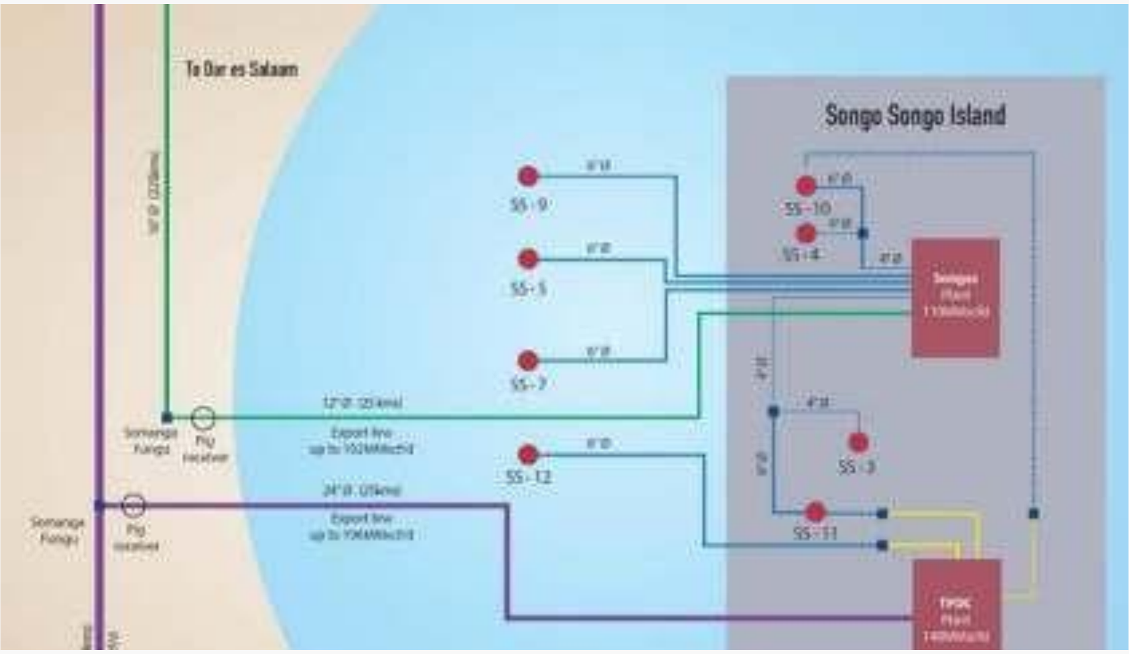
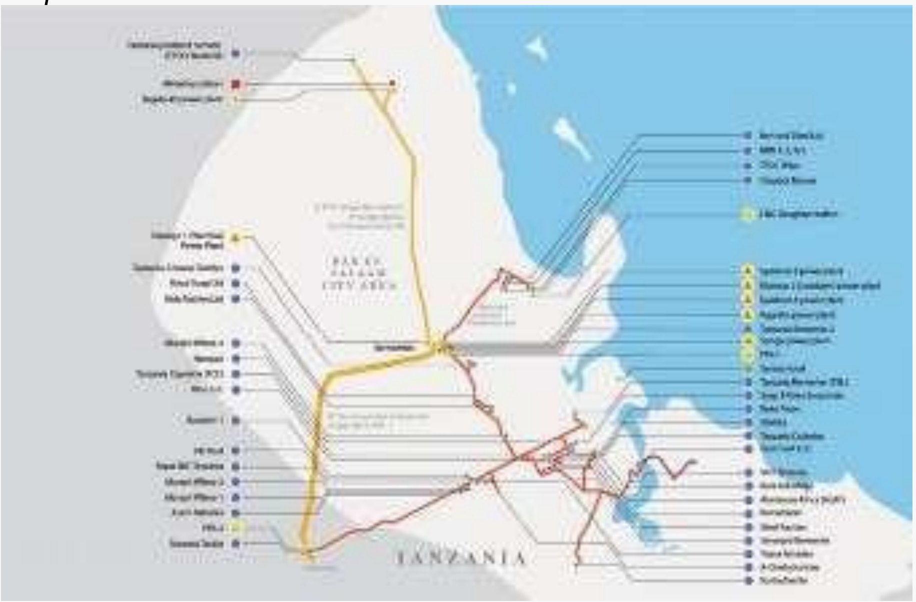
In July 2017 the Government of Tanzania approved the Second Additional Gas Plan (“AGP-2”) by



PanAfrican energy more than doubling the available volume of Additional Gas for sale from the Songo Songo Field. Under the Production Sharing Agreement for the Songo Songo gas field, production is identified as “Protected Gas” or “Additional Gas.”Prior to being permitted to market and sell increased volumes of Additional Gas from the Songo Songo Field, under its Project Agreements the Company is required to prepare and submit for approval an Additional Gas Plan that demonstrates how such demand for Additional Gas can be met to the end of the existing licence in 2026. Beyond ensuring the supply of Protected Gas to 2024, and the increased sale of Additional Gas to 2026, AGP-2 also contemplates additional field development to support and optimize the Songo Songo production profile through the life of the field.

Source: Orca Exploration



Source: Orca Exploration

SongoSongo Field has a gas processing plant rated at 110 MMcfd and a pipeline connecting the field to Dar es Salaam with 102 MMcfd capacity; the capacity can be increased by connecting to the recently commissioned National Natural Gas Infrastructure Project (NNGIP) which added 140MMcfd processing capacity on the island and 785 MMcfd additional pipeline capacity to Dar es Salaam.

Current production capability stands at 165MMcfd with ability to increase to 180 from eight production wells (SS-3, SS-4, SS-5, SS-7, SS-9, SS-10, SS-11 and SS-12). In 2015, SS-5, SS-7 and SS-9 were successfully worked over.

In mid-2019 the Company commissioned refrigeration on the Songas processing plant to overcome the effects of reservoir pressure decline following 15-years of successful production and restore maximum production potential to around 97 MMscfd. The refrigeration project is part of a two-phase initiative and will be followed by the installation of compression. Refrigeration is now operational and compression was expected to be completed in 2021.
In addition to the installation of refrigeration and compression, Orca expects to complete limited reconfiguration of surface flow lines to increase production from several wells and enable incremental increases of supply to the NNGI in line with demand.

As per the independent natural gas resource assessment report dated as of June 30, 2019 there still remains an estimated 293 Bcf of gross natural gas reserves to be produced and an estimated 1 trillion cubic feet of gross unrisked contingent and prospective resources remaining at the end of the current licence period. In 2021 Orca had it expects an increase in production from 58MMcfd in 2021 to between 60 and 66MMcfd in 2022. As of November 2023 additional gas sales averaged 83.9 MMcfd to the end of Q3 representing a 45% increase from the same period in 2021 and averaged 92.1 MMcfd during the third quarter, representing new sales records and record production from the Songo Songo field. Currently Songo Songo is producing approximately 135 to 140 MMcfd of gas (Protected Gas and Additional Gas) and rapidly approaching the current design capacity of approximately 150-155 MMcfd following the $75 million invested in compression, well work overs and integrity management projects over the past two years.

Orca plans a well workover program including reactivation/recompletion of two wells SS-3 and SS-4 to access incremental reserves in the Songo Songo East pool (Q1 2022). The Company successfully completed smart pigging of the SS-3, SS-4 SS-5, SS-7 and SS-9 flowlines, identifying a number of areas of advancing corrosion or erosion. Immediate, low cost repairs of sections of flowline have been conducted and wells returned to operations with minimal impact on overall production. The Company is now planning a program of full flowline repairs on two flowlines in 2023 in accordance with the Company’s integrity management plan.

The Company also has conducted a range of sand monitoring operations following recent sand production modelling and limited sand production through several wells. Sand mitigation measures have also been implemented, including: down hole sand control in two of the recent well workovers; the installation of one fixed acoustic detector at the inlet manifold of the Songas gas processing plant, and one mobile acoustic detector which can be aligned to individual wells as necessary; and the installation of a cyclonic de-sanding unit at the SS-10 wellhead, with a second ready for installation on the next well, to be prioritized through further testing. All wells, with the exception of the SS-12 well which is permanently aligned to the NNGI plant, and the SS-4 and SS-7 wells which are currently not on production, have been individually aligned to the test separator to assess each for sand production. The Company has also proposed the purchase of an additional five wellhead de-sanding units in 2023

Further, 3D seismic is planned to properly image the Songo Songo gas field and additional contingent/ prospective resources over the Songo Songo license acreage (commencing H2 2022). In August 2022 Orca announced that the 3D seismic acquisition programme expected to cost USD$23 million covering a total area of 200 km2 to include the adjacent Songo Songo Licence with a ca. 12.5 km2 incursion into the Kiliwani North Development Licence which has been awarded to African Geophysical Services LLP (AGS).

Having now received all environmental approvals the company is targeting completion of the acquisition programme before year end to align with the optimum weather window and assure highest quality data acquisition.
Processing and interpretation H1 2023.

To address declining reservoir pressure and ensure maximum production levels can be sustained, subject to demand Orca in August 2020 signed a contract with China Petroleum and Technology Development Company (CPTDC) for the design, supply, installation and commissioning of natural gas compressors within the Songas gas processing facility on Songo Songo Island.

The compressors will work in harmony with the previously installed refrigeration, through to the end of the Production Sharing Agreement in 2026.

Orca has announced plans for accelerated front end engineering for additional compression which has been proposed in the 2023 budget in addition to the procurement of long lead items for potential new drilling in 2024 to keep pace with the accelerated

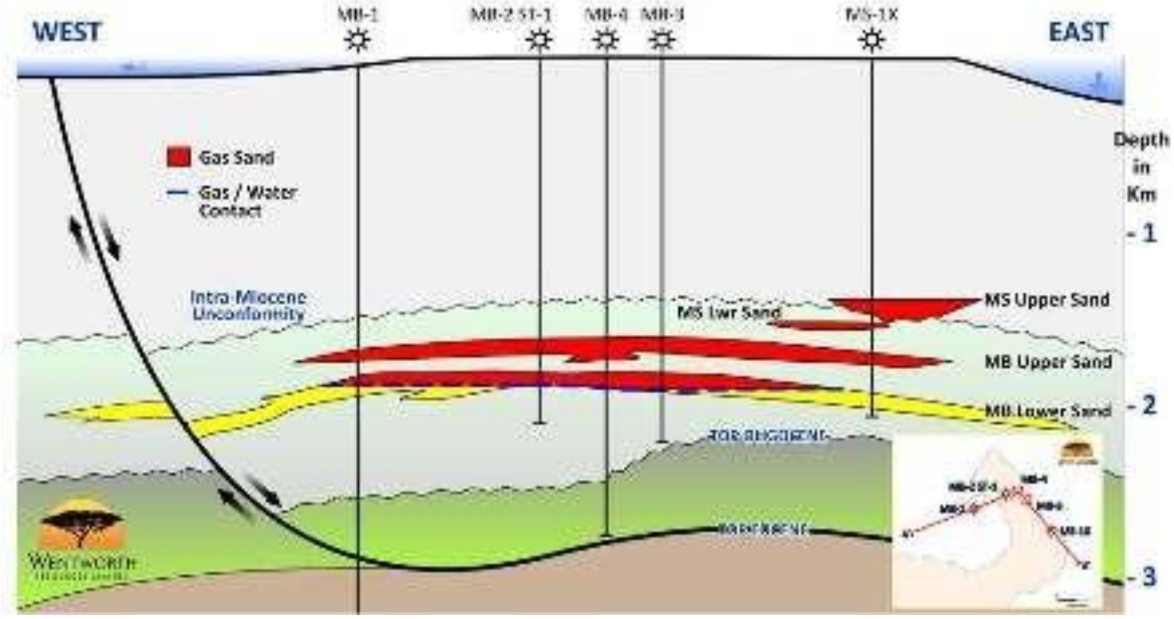
Additional gas sales demand, which will have nearly doubled in the span of less than two years.

Mnazi Bay - Maurel et Prom and Wentworth

The Mnazi Bay license lies between the Ruvuma and the Offshore Block 1 concessions in Tanzania both onshore and offshore in south-eastern Tanzania bordering the Ruvuma River to the south and extending east into the Indian Ocean.

The Mnazi Bay gas field was discovered in 1982 by Agip but due to the lack of gas market in Tanzania the field was not developed at the time until Artumas (now Wentworth Resources) acquired the block and initiated the Mtwara Energy Project (MEP). Maurel & Prom later farmed into the license and gas production began in 2006.

The license is now operated by Maurel et Prom with 48% working interest, Wentworth Resources 32% and TPDC (Tanzanian Government) with 20%. In December 2022 Wentworth Resources plc and Etablissements Maurel & Prom S.A. (M&P) announced that they have reached agreement on the terms of a recommended acquisition of the entire issued and to be issued share capital of Wentworth by M&P.



The Mnazi Bay field has five producing wells namely:MB-1, MB-2 ST 1, MB-3,MB-4 and MS- 1X.The company has identified near-term drillable exploration targets that have the potential toincrease existing reserves.

Net 2P reserves are estimated at 500Bcf and the current gas production is between 40– 50 MMscf/d with a long-term GSA in place for up to 130 MMscf/d from the Mnazi Bay concession to the new government owned, transnational pipeline with initial delivery volumes commencing in Q3 2015 until October 2031.

The primary end user of the Mnazi Bay gas is state owned electrical utility company TANESCO under Ubungo II and Kinyerezi II power plants although there are several identified consumers. The average quarterly gas production stands at a minimum of 82.5MMscf/d against a demand in excess of 95MMscf/d arising from: Kinyerezi 1 (29 mmscfd), Kinyerezi 2 (37 mmscfd), Ubungo 1 (20 mmscfd), Goodwill (5 mmscfd), Dangote (8 mmscfd) and Mtwara (2 mmscfd). Kinyerezi-1 power station extension which started late 2020 is expected to lead to an additional 20-30 MMscf/d. Mnazi bay has had reliable and consistent production with the capacity to increase production to 100 MMscf/day with no further capex. Gas currently accounts for more than 50% of current power generation in Tanzania with plans to increase gas to power production in future being a low carbon solution. Wentworth Resources has raised its 2022 production guidance for the Mnazi Bay gas field in Tanzania by around 20% from the lower end of its original guidance to achieve an average gross daily production rate of approximately 90 million standard cubic feet per day for 2022 from the earlier 75 to 80.

In 2023 the JV has agreed on a capital expenditure budget for 2023 of $13.5 million as well as a further contingent capital expenditure program of $42 million.

Kiliwani North – ARA Petroleum

The Kiliwani North field is located off the coast of Tanzania and is operated by Aminex through Ndovu Resources its wholly operated subsidiary. The field is next to Songo Songo Field which commenced production in 2004. The current participants in the Kiliwani North Development Licence, following TPDC back in, are: Ndovu Resources Ltd (Aminex) 54.575% (operator), RAK Gas LLC 23.75%, Solo Oil plc 7.175%, Bounty Oil & Gas NL 9.5% and TPDC 5%.

The Gas was first discovered at the Kiliwani North 1 well in 2008 drilled vertically from Songo Songo Island. Aminex received the Kiliwani North development license in 2016 an area carved out of the Nyuni East Songo-Songo Production Sharing Agreement production began 2016 following the completion of gas processing and transportation infrastructure on Songo Songo island in 2015.

In 2015 the government completed a US$1.2 billion gas infrastructure project which includes a new 36 inch pipeline from Mtwara pipeline to Dar es Salaam a 24 inch offshore spur line from Songo Songo island to the 36 inch pipeline and a gas processing facility on Songo Songo island. One of the new gas processing facilities receives gas from Kiliwani North. Daily production rate has reached up to 30 mmscfd in early July 2016 but has since dropped to under

1mmscfd in November 2017 due to low reservoir pressure and inlet pressure restrictions of the gas processing plant.

A review of the existing technical data leads led to a conclusion that Kiliwani North-1 was draining a compartment within the greater Kiliwani North structure exhibiting slow recharge across faults or via tortuous pathways. As a result of reservoir pressure decline and compartmentalisation, the Kiliwani North-1 well has since stopped production. Aminex undertook preliminary remedial work to repair the downhole safety valve in late 2018 which resulted in the flow of a small volume of gas, to the gas facility, before the well quickly ceased.flow. The operator prepared a perforation strategy for a lower zone within the reservoir and an alternative remedial work programme intended to establish fluid levels in the wellbore, reservoir pressure and to unload potential fluid using foam treatment.

Plans to acquire 3D seismic over part of the Kiliwani North Development Licence and multiple leads on the adjacent Company-held Nyuni Area acreage as part of the same programme are ongoing and expected to commence in mid February 2022. After processing and interpretation of the proposed 3D seismic data, Aminex expects to identify a potential side-track and new drilling locations on both the Kiliwani North and Kiliwani South structures with the intention, on the back of drilling success, to deliver near term gas to the Songo Songo Island Gas Processing Plant

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