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Chartered Accountant SINGAPORE

Singapore CA Qualification Examination

INTEGRATIVE BUSINESS SOLUTIONS

ADVANCE INFORMATION

6 June 2022

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WARNING

Candidates **must not under any circumstances** contact any similar company or its agents to obtain research data, and they must use **ONLY PUBLICLY AVAILABLE INFORMATION.** Under no circumstances should they seek to use unpublished or private information.

ISCA INSTITUTE OF SINGAPORE CHARTERED ACCOUNTANTS

SINGAPORE ACCOUNTANCY COMMISSION

Dear Candidate,

This information package contains the **Advance Information** for the Integrative Business Solutions (IB) module final examination to be held on **6 June 2022.** A checklist of the documents (Exhibits) contained in this information package is provided on the following page. It is your responsibility to ensure that you have received every document listed.

Your task now is to familiarise yourself with this information including analysing the data provided. In addition, you are encouraged to undertake further research to form a holistic picture of the industry and markets in which the case study company is operating, and the general economic and business environment. Diligent preparation is essential for success in the IB Examination. **Guidance on preparing for the IB Examination is covered in your IB Toolkit.**

The IB examination will be conducted using Cirrus. Please download this Advance Information to the hard drive on your laptop and print this Advance Information prior to the examination day. Although you will have full access to the hard drive on your laptop during the examination, you are strongly advised to have your notes and other preparatory workings in **hard copy format,** as well as a standalone calculator that complies with the SAC's regulations for your examination.

You will also receive additional information (**Examination Day Documents**) on the case study company on the day of the IB Examination. The Examination Requirements will be included within Cirrus. Follow the instructions in Cirrus to download the Examination Day Documents. You are not allowed to print the Examination Day Documents on the day of examination. The Examination Day Documents complete the case study scenario and set out the requirements for the report that you are required to write. The IB Examination will be an open-book examination of **4 hours 30 minutes** duration. Your formal report will cover four specified areas, one of which will be to write an Executive Summary. Please note that **only your report commentary (including the assumptions made), appendices, and workings entered in Cirrus on the day of the examination will be marked**.

PUROCO

Advance Information – List of Exhibits

Note: Unless otherwise stated, all dollar amounts ($) are in Singapore dollars.

EXHIBIT 1

Puroco Ltd - Company background and Puroco's wastewater treatment solutions

Puroco Ltd is a leader in the water and wastewater treatment industry. The company started out by selling water treatment systems with five employees and a capital of $25,000. Today, it employs 2,500 worldwide and has a track record that includes building Singapore's first water recycling plant and some of the largest seawater desalination plants in the world. Headquartered in Singapore and listed on the Singapore Exchange (SGX), Puroco's operations span Asia Pacific, the Middle East, Africa and the Americas.

Areas of operations

The company has three areas of operations:

Desalination: Desalination involves pushing seawater through membranes to remove dissolved salts and minerals as a means of purification. Puroco's membrane-based desalination solutions are helping fast-growing cities and industries in water-scarce regions to meet their current water demands while providing a stable source of supply for the future. Its desalination projects range from small plants for power stations to large-scale ones that handle up to 500,000 m^3/day to support rapid urbanisation in developing cities.

Wastewater treatment and recycling: A pioneer in providing NEWater solutions, Puroco makes wastewater safe to discharge into the environment or to reuse as potable or industrial-grade water. Through its membrane bioreactors and proprietary Klearer® ultrafiltration membranes, Puroco customises treatment processes by building, operating and maintaining plants that meet the specifications of its municipal and industrial customers, with the level of treatment depending on the quality of water required.

Mobile water treatment: Puroco has developed a range of mobile water treatment machinery that can be used to purify water on a much smaller scale, for example on a construction site, or in a small village where contaminated water supplies can be decontaminated to enable the community to access clean water.

Key opportunities

A leader in the water and wastewater treatment industry, it is committed to finding cost-effective and innovative solutions to contribute to resource optimisation and sustainable growth for communities and industries within Singapore and beyond.

Puroco is in the midst of building Singapore's largest waste-to-energy plant, which will also be Asia's first integrated water and power project. The plant's completion has unfortunately been delayed to 2025 instead of 2023 due to funding and operational issues. Puroco's management team is currently considering entering into a joint venture with Singen Corporation to inject the additional capital and skills required for the last milestone. Overall costs are expected to be in the region of $500 million.

Downstream integration: Puroco has been approached by EVO, a well-established bottled water supplier, to work together with its R&D team on a proprietary technology that will allow an optimal level of oxygen to exist in water.

In 2020, given the large amounts of capital tied up in completed projects, Puroco adopted an asset-light strategy. This allows it to recycle its capital and invest in new infrastructure or projects both locally and overseas. This asset-light strategy involves selling some "completed capital intensive infrastructure projects" to global utility providers.

END OF EXHIBIT 1

EXHIBIT 2

Water management in Singapore

As a natural resource-scarce island nation with limited freshwater sources and catchment capacity due to its size and geography, Singapore has risen against all odds to become the global leader in water sustainability that it is today. From inheriting a legacy of water import agreements with Malaysia, which has made -Singapore susceptible to the resulting price conflicts that continue to shape its national policies, to overcoming unforeseen disasters like the extreme drought that caused acute water shortages and emergency rationing in the 1960s, its journey so far has been fraught with challenges. However, thanks to the vision of its first and longest-serving prime minister, the late Mr. Lee Kuan Yew, who has also been credited as 'the architect of Singapore's water story', the city-state is well on its way to becoming water self-sufficient before 2061 – a deadline that coincides with the expiry of ongoing contracts with its neighbour.

Public Utilities Board

A statutory board under the Ministry of Sustainability and the Environment in Singapore, the Public Utilities Board (PUB) was initially set up in 1963 to coordinate the supply of electricity, piped gas and water, but was eventually reconstituted in 2001 as the national water agency. By then, the Singaporean government had deemed PUB as a specialised authority, crucial for addressing the city-state's rapid development and rising demand for water. The current demand for water in Singapore stands at approximately 430 million gallons or the equivalent of 782 Olympic-sized swimming pools a day. As part of its role in ensuring a diversified and sustainable supply, PUB has been intensifying its efforts in finding integrated, effective and cost-efficient ways to meet the nation's present and future water needs.

PUB's holistic water management approach

The Lee Kuan Yew School of Public Policy estimate that water demand in Singapore is expected to almost double the amount it was in 2016 by 2060. In light of this forecast,

PUB has introduced comprehensive demand management policies over the years to address pricing, water conservation and public education. Designed to reduce water wastage, these policies have included the implementation of block tariff structures, the charging of volumetric/sanitary appliance fees, the introduction of a labelling scheme, and fund/management plan requirements relating to water efficiency. Although some have evolved with the times, all of them serve to complement PUB's 3 key strategies:

Collect every drop: Recognising the importance of making every raindrop count in land-starved Singapore, PUB plans to increase its water catchment ability by up to 90% of its land area by 2060. As there are separate rainwater and used water collection systems as well as strong environmental controls already in place, the water collected will be protected from pollution.

Reuse water endlessly: In the long run, water recycling will be the most sustainable and cost-effective way to ensure the continuity of Singapore's water supply and increase it as a whole. To improve the water recycling rate, PUB plans to: (i) reclaim used water from industrial sources for non-potable use; (ii) increase water recovery from water reclamation and NEWater treatments; and (iii) reduce losses from PUB's supply by encouraging seafront companies to use seawater for cooling processes.

Desalinate seawater: Desalination, where seawater is pushed through membranes to remove dissolved salts and minerals as a means of purification, seems like the most natural option for Singapore as an island. As a long-term strategy, PUB continues to invest in research and development (R&D) to further improve the energy efficiency and economic viability associated with the desalination process.

The '4 National Taps' and water sanitation in Singapore

To understand the rationale behind PUB's holistic water management approach, it is vital to take a look at Singapore's '4 National Taps'. A term coined by then-Minister for the Environment Mr. Lim Swee Say, it refers to the sources that the nation relies on for its water supply today:

Rainfall collection from catchment areas: Singapore has a total of 17 reservoirs, to which rainwater is channeled through a network of rivers, canals and drains before it is treated. With the completion of the Marina, Punggol and Serangoon Reservoirs, the city-state is now recognised around the world as one to watch in the urban planning/design field for harvesting urban stormwater on a large scale for potable consumption.

Imported water from Malaysia: Since separating from the Federation in 1965, Singapore continues to depend on Malaysia for water supply, resulting in several agreements and negotiations that have been signed over the years. Although the future remains uncertain, with the last agreement dating back to 1990 and PUB's steadfast commitment to establishing water self-sufficiency, two contracts remain active and are set to expire in 2061.

NEWater: Officially launched in 2003 with the opening of its first two plants in Bedok and Kranji, NEWater is the result of decades of research and efforts by engineers to achieve a workable water reclamation process in Singapore, which involves micro-filtration, reverse osmosis and ultraviolet radiation to treat used water into ultra-clean, high-grade reclaimed water. Although there are currently five plants supplying up to 40% of the water needed by the nation, there are plans to triple capacity and meet 55% of future demand by 2060.

Seawater desalination: Driven by advancements in membrane technology, Singapore is picking up the pace innovation-wise to increase its number of independent water sources. Since its first desalination plant in Tuas, the largest of its kind in Asia, began operating in 2005, the nation has been able to have up to 25% of its water needs met. Most recently, the Keppel Marina East Desalination Plant, Singapore's first large-scale dual-mode desalination facility capable of treating both freshwater and seawater, commenced operations in 2021.

In terms of sanitation, Singapore's Deep Tunnel Sewerage System (DTSS) serves as a sustainable, cost-effective solution to meet the nation's used water collection, treatment, reclamation and disposal processes. Deemed the 'used water superhighway for the future', it leverages gravity to convey used water to centralised water reclamation plants located at coastal areas, which is then further purified into NEWater or discharged into the sea. While Phase 2 of the project, comprising 40 km of deep tunnels and 60 km of link sewers to serve the western part of the island, is still underway and set to complete by 2025 at a cost of S$6.5 billion, DTSS has received the Institution of Engineers Singapore Prestigious Engineering Achievement Award and the ASEAN Outstanding Engineering Achievement Award in 2005, as well as the International Water Association's Project Innovation Award in 2008. The 108 km-long Phase 1, which was completed in 2008 at a cost of S$3.4 billion, currently serves the eastern part of the island.

Meeting Singapore's water efficiency benchmarks

In 2015, PUB introduced Mandatory Water Efficiency Management Practices (MWEMP) to manage water demand in the non-domestic sector. At present, the sector utilises around 55% of the nation's water supply – a number that is set to increase to 70% by 2060. Under MWEMP, PUB requires large water users to submit details of their water consumption, business activity indicators and water efficiency plans annually, so that it can develop sectoral water efficiency benchmarks for hotels, office buildings, retail operations, wafer fabrication and semiconductor plants, commercial laundry, data centres as well as biomedical manufacturing facilities. These details also enable PUB to gather good practices and publish them in the form of Best Practice Guides across the different industries.

Generally, water efficiency is measured via the Water Efficiency Index (WEI), a performance indicator that refers to the amount of water used per business activity indicator:

WEI = Total amount of water consumed / Business activity indicator

PUB's smart roadmap for intelligent water management

With some of the best water conservation policies already in place, Singapore is setting benchmarks on a regional and global scale, as reported by Siemens' Economist Intelligence Unit in its Asian Green City Index. However, there is still much work to be done. Although the increase in average water usage per head from 141 litres in 2019 to 154 litres in 2020 is attributed to more home stays due to COVID-19, PUB is looking to install 300,000 smart water meters island-wide and lower consumption levels to 130 litres per head by 2030. It has also devised a roadmap that will progressively combine the use of artificial intelligence, big data and smart redesigns to improve its own operations and water management capabilities.

The eventual impact of all these developments on water prices remains to be seen, considering the rising costs of water treatment, reservoir operations, NEWater production, desalination, used water collection and treatment, as well as the maintenance and expansion of the island-wide network of water pipelines. The last time revisions were made to pricing in 2017, a 30% increase was phased in over two years.

END OF EXHIBIT 2

EXHIBIT 3

Industry players in the Singapore water industry

Making waves on the global scale

The water industry has been growing steadily in Singapore, as the latter moves towards becoming a 'water-wise city' according to the principles of the International Water Association. These principles aim to ensure that water is well-integrated into the planning and design of cities to equip them for climate change, encourage livability and enhance collaborative action. With over 100 local companies in the water and wastewater treatment sector contributing S$2.5 billion in value to the economy and creating 14,400 jobs to date, the city-state has built up the expertise needed to help with problems on an international level, spanning other Asian countries, the Middle East, Latin America and Africa. It has also played host to key global events, such as the Singapore International Water Week (SIWW), which is an annual premier platform for sharing and co-creating innovative water solutions. All this is underlined by the Global HydroHub initiative led by PUB and the Singapore Economic Development Board (EDB), which sets out to unite government organisations, private companies and research institutes to:

(i) promote water R&D;

(ii) grow the industry; and

(iii) position Singapore as the global R&D base for water solutions.

Market analysis

According to MarketWatch, the global industrial wastewater treatment service market is projected to reach USD 28.0 billion by 2024 from an estimated USD 20.8 billion in 2019 at a CAGR of 6.1% – an increase attributed to factors such as growth in the power generation sector, water intensive processes in the oil & gas, textile and pulp & paper industries, as well as increasing industrialisation and urbanisation. These factors are also likely to impact the water industry in Singapore. Interestingly, the 2020 Global Water

Report by CDP (the global environmental reporting organization) has found that inaction on water sustainability issues has become five times more expensive for companies. This means that the costs of not addressing water risks are now far greater than the costs incurred to address them. Despite COVID-19, there was a 20% increase in corporate disclosure worldwide relating to water usage and security, indicating that more companies are recognising what is truly at stake if our planet's resources were to continue depleting rapidly. These companies are also realising the power of transparency to influence stakeholders from a financial point of view. Overall, although businesses have been affected by the outbreak, the same report conveyed their readiness to rethink their strategies and transform their business models towards building a water-secure world, with two-thirds of the respondents reducing or at least maintaining water withdrawals – a trend that is likely to trickle down to Singapore as well.

Key growth drivers

Sustainability: Due to Singapore's renown as a global hub and meeting point for experts, the growth of its water industry is closely connected to what happens around the world. Driven by facts like water shortages are affecting more than three billion people worldwide, an increasing number of local organisations have also been pegging their Environmental, Social and Corporate Governance (ESG) performances to the United Nations Sustainable Development Goals in recent years, of which Goal No. 6 covers issues relating to clean water and sanitation. This collective focus on sustainability and Singapore's ongoing journey towards becoming a greener city will continue to drive its water industry.

Industry 4.0: In terms of technology and innovation, the nation has been ahead of the curve, making headlines for achievements like its advanced wastewater treatment process and digital capabilities that won The Institution of Engineers Singapore (IES) Prestigious Engineering Achievement Award at the World Engineers Summit 2019. Industry 4.0, the industrial revolution that will allow companies to substantially improve their production processes, has also been making ripples in the scene. Through a

combination of advancements in digitisation, interconnectivity, data analysis and automation, the water industry is set to integrate physical production and operations with smart digital technology, machine learning and big data to address pressing issues such as: (i) an ageing workforce and lack of opportunity to transfer skills across generations; (ii) asset management as operating costs skyrocket and infrastructure deteriorates; (iii) climate risk; and (iv) emerging contaminants that could potentially harm human and aquatic life.

Key market players

As Singapore has constantly been recognised as the world's best place for doing business over the years, it comes as no surprise that many companies have started up or set up shop in Singapore. Within its water industry, there is a strong presence of international companies like **Suez Group**, which champions smart and sustainable management of resources, as well as **Xylem**, which specialises in water and wastewater solutions. Both have worked closely with PUB within the spaces of operations and innovation respectively. Local listed companies such as **Sembcorp Industries** (more below), a leading energy and urban development player, as well as **Keppel Corporation**, which aims to deliver sustainable urbanisation, are leading the pack, complemented by small and medium enterprises (SMEs) like **ECOSOFTT** and **ZWEEC Analytics** that are making a mark on the technology front.

Sembcorp Industries: Headquartered in Singapore and listed on the SGX with a turnover of S$5.4 billion in 2020, Sembcorp is a leading energy and urban solutions provider that is focused on growing its renewables and integrated urban solutions businesses. With a balanced energy portfolio of over 12,800MW, with more than 3,300MW of renewable energy capacity comprising solar, wind and energy storage globally, it has a proven track record of transforming raw land into sustainable urban developments spanning over 12,000 hectares across Asia. Its integrated solutions include owning and operating water and wastewater management facilities, with a gross treatment capacity of 8.3 million m^3/day.

Key industry trends

Digital transformation has become a priority for many companies around the world, particularly after the events of 2020. The ways with which people live and work have changed fundamentally, accelerating the need for innovative solutions to navigate the new normal swiftly, smartly and safely. Although the future remains as uncertain as ever, the water industry will collectively be aiming to achieve optimum management and bolster resilience digitally, according to an article recently published by Smart Water Magazine. The same article outlines the 2021 key trends as follows:

Remote, digital water management: Instead of having to be linked to physical workstations as has traditionally been the case, more utilities companies are leaning towards an agile and collaborative management model involving all stakeholders, which can be operated digitally. Through this model, specialised teams can also be formed to respond more quickly to incidents, without endangering employee health or safety.

Centralised, autonomously run drinking water treatment plants: As a by-product of digital transformation, process management in water treatment plants can be more centralised, autonomous and efficient, as compared to the current silo-based one, which is fragmented in terms of technologies and operating modes.

Automatic, preemptive decisions in wastewater treatment plants: With more centralized management platforms enabling real-time monitoring of variables and automated decision-making, wastewater treatment plants could see a reduction in preventable incidents, resulting in a more sustainable process overall.

Data analysis, sensors and communications in leak detection: To reduce human effort or error and simultaneously enhance water loss reduction processes, technological advances will enable the consolidation of new leak detection methods across sectors to allow for more efficient usage of water as a resource.

Smart irrigation and remote metering in agriculture: Due to improvements in hydraulic and operational efficiency made possible by the installation of sensors and remote meters, more farmers will benefit from automatic irrigation rescheduling, which optimises water consumption and reduces the industry's carbon footprint.

Using 5G to manage water service infrastructures: By leveraging 5G's low latency and ability to connect millions of devices in a small area, managers will be able to increase performance and productivity through autonomous infrastructure operations, remote driving and relevant real-time data.

END OF EXHIBIT 3

EXHIBIT 4

Puroco - Description of Company and its operations

Puroco has become a world leader in the construction of water treatment plants. The company's activities are as follows:

Construction

Puroco uses its expertise and experience to construct water treatment plants. These include seawater desalination plants, sewerage treatment plants and potable water plants. The majority of customers are municipalities (local or national governments) but Puroco also constructs on behalf of industrial customers, for example companies that require the use of large quantities of water in their own production processes. Such plants typically take two to three years to build.

The majority of projects are **Build, Operate and Transfer agreements.** As consideration for building the plant, Puroco is given a concession to operate the plant for a period of 25 years after construction, during which time it has the right to charge users for clean water or sewage treatment. After 25 years, the plant is transferred to the grantor, usually for a small or zero payment.

Recent major projects include the following:

Singapore - Construction of a desalination plant that can treat 500,000 m^3 of seawater per day. This was completed in 2017 and was valued at $450 million upon completion.

Qatar - The company won a contract to build and operate a desalination plant that treats 200,000 m^3 of seawater per day. The capitalised value of this contract was $150 million upon completion in 2018.

Tunisia - The company built a waste treatment plant that can recycle 300,000 m^3 of waste water in a major urban area. The construction took place during 2018 and 2019 and the amount capitalised was $240 million upon completion.

China - The company has built and completed two sewage treatment plants in two large cities in China. The first has a value of $70 million upon completion, and the second in a value of $75 million upon completion. Both projects were completed during the year 2020.

Waste recycling

Until 2018, all of Puroco's activities related to water desalination or purification. However, in 2019, the company decided to move into the waste recycling industry, and since 2020 has been constructing a waste to energy incinerator in Singapore that when completed will be capable of incinerating 3,600 tonnes of waste a day, using the heat to power a turbine and produce electricity. The incinerator will provide electricity to power the desalination plant, also operated by Puroco under a “Build, Operate and Transfer” agreement.

Mobile water equipment

Puroco manufactures mobile water purification equipment that can be used to purify water on a smaller scale, for example in areas where there is a scarcity of naturally available clean drinking water. The equipment involves purifying surface or ground water so that it is free from pollution, and harmful organisms. Puroco first started to sell such systems in the year 2019, and this has become a growing area of the company's operations.

Company structure and management

The board of directors is responsible for setting the strategy of the company and monitoring its performance. It is chaired by Mr Lim Wan Yong--a non-executive director, and includes Ms Melissa Wong--Chief Executive Officer, Mr Eugene Chung--Chief Operating Officer, Ms Liew Khoo--Chief Financial Officer, and four additional non-executive directors. All five non-executive directors are independent.

The management committee of Puroco is responsible for the day-to-day operations of Puroco and is made up of the following:

Chief Executive Officer	**Ms Melissa Wong** Ms Wong was the founder of Puroco and has led the company throughout its history.
Chief Operating Officer	**Mr Eugene Chung** Mr Eugene Chung has worked for Puroco as a project manager for over 10 years and became COO two years ago.
Chief Financial Officer	**Ms Liew Khoo** Ms Khoo joined Puroco as CFO five years ago, after a career in a large accounting firm where she reached the position of partner.
Business Development Director	**Mr Ben Hoong** Mr Hoong joined Puroco five years ago as a sales manager and was recently promoted to Business Development Director.
Human Resources Director	**Mr Lawrence Tan**. Mr Tan has worked for Puroco for over 10 years as HR director. Prior to this he worked for a bank as HR officer.
Research and Development Director	**Mrs Susan Li** Mrs Li has worked in the R&D department of Puroco since it was founded and was promoted to the role of R&D director three years ago. Before this she worked as a researcher for a major pharmaceutical company.

Head Office

The company's head office is located at the International Business Park in Jurong. The head office houses all the various departments that support Puroco, including Projects, Business Development, Finance, HR and IT.

Projects

The projects department manages the large construction projects that the company undertakes. There is a team of civil engineers who design the plants, and a project management team that manages the construction. Much of the work on projects is performed by contractors, and these are overseen and managed by the project management team.

During the year 2020, many potential clients delayed starting potential projects as a result of the Covid-19 pandemic, and work on many of the projects that had already started was disrupted, causing delays to completion of these.

Manufacturing

The manufacturing department is responsible for the manufacture of the mobile water purification systems. The manufacturing takes place in a factory, close to the head office in the International Business Park.

Research and development

Puroco's success is largely built on the technology that has been developed by its R&D department, which is based in Singapore. Puroco uses an advanced membrane-based wastewater treatment method that is simple, quick and cost-effective by combining the membrane filtration process with a low carbon footprint biological treatment. Its proprietary Klearer® ultrafiltration membranes are able to provide industries and communities facing water shortages and usage restrictions with reliable, high-quality supply. Developed, tested and manufactured in Singapore, they are found in over 400 installations worldwide ranging from municipal applications in water purification/wastewater recycling and industrial applications in power plants to pharmaceutical, textile and food and beverage water treatments. Since launching in 2016, the product has won awards within the industry; and Puroco has had several offers to acquire its Intellectual Property from local and international entities – including the Singaporean government.

During the year 2019, Puroco also commenced the development of another ultrafiltration membrane, featuring reinforced fibres for greater strength, enhanced hydrophilicity and better performance at higher flux rates. Puroco's management team is still in the midst of deciding if a new IP application is needed, or if the product should fall under the existing Klearer® line. Currently the project has been dubbed "Klearer II" internally. Management is also interested to know if there are government grants available in Singapore to assist in the development of this technology. More information about the Klearer II project is provided in Exhibit 8.

Finance

The finance department's most important role at Puroco is to raise the funding required to finance the construction of the plants. In the case of the "Build, Operate and Transfer" projects, capital is tied up not only for the period of the construction, but also throughout the period of the concession, as the granting of the concession represents the consideration for constructing the plants. Thus, capital is tied up for close to 30 years.

During the year 2019, the company successfully increased its share capital from $400 million to $600 million through a rights issue. The company also uses a combination of long term bank loans and corporate bonds as debt finance.

Recently, the company has introduced a strategy of capital recycling, which involves aiming to sell the concession rights of completed plants, rather than continuing to operate the plants. This frees up capital to invest in the construction of new plants. The first example of this policy in action occurred during the financial year ended 31 December 2020, when the company sold the rights to its concession in Tunisia to the global utility company "Eau de France" for a consideration of $265.4 million, leading to a profit on disposal of $35 million.

END OF EXHIBIT 4

EXHIBIT 5

Puroco - Management accounts for the three years to 31 December 2020

Statement of Profit and Loss	**Notes**	**Year ended 31 December**		
		2020	***2019***	***2018***
		$000	*$000*	*$000*
Revenue				
Construction	1,2	80,000	250,000	245,000
Operating and maintenance revenue		252,439	231,707	184,146
Sale of mobile water equipment		12,000	6,000	–
Total revenue		344,439	487,707	429,146
Cost of sales:				
Contract costs		(60,000)	(175,000)	(171,500)
Operations and maintenance costs		(146,939)	(136,707)	(108,646)
Amortisation of service concession agreements	5	(40,000)	(42,800)	(33,200)
Manufacturing of mobile water equipment		(9,000)	(8,000)	–
Total cost of sales		(255,939)	(362,507)	(313,346)
Gross profit		88,500	125,200	115,800
Research and development costs	6	(4,652)	(7,457)	(5,764)
Other income	3	35,000	–	–
Head office costs		(31,500)	(45,000)	(42,750)
Profit before interest and tax		87,348	72,743	67,286
Investment income		1,667	–	–
Finance costs		(28,000)	(35,000)	(31,500)
Profit before tax		61,015	37,743	35,786
Tax expense		(7,322)	(5,284)	(3,936)
Profit for the year		53,693	32,459	31,850
Dividends		(10,739)	(6,492)	(6,370)
Retained profits		42,954	25,967	25,480

Statement of financial position as at 31 December

	Notes	2020	2019	2018
		$000	*$000*	*$000*
Non-current assets				
Property, plant and equipment	4	28,813	35,501	28,684
Service concession agreements	5	811,200	911,600	714,400
Development costs	6	26,000	31,000	36,000
Total non-current assets		866,013	978,101	779,084
Current assets				
Construction contract balances	7	40,000	130,000	120,000
Inventories		21,418	31,422	26,228
Trade and other receivables		44,194	40,378	30,271
Short term investments		200,000	–	–
Cash and cash equivalents		7,759	63,481	10,000
Total current assets		313,371	265,281	186,499
Total assets		1,179,384	1,243,382	965,583
Equity				
Share capital		600,000	600,000	400,000
Retained earnings		150,644	107,690	81,723
Total equity		750,644	707,690	481,723
Long term liabilities				
Loans and borrowings		400,000	400,000	400,000
Current liabilities				
Trade and other payables		21,418	30,408	26,228
Loans and borrowings		–	100,000	50,000
Tax payable		7,322	5,284	7,632
Total current liabilities		28,740	135,692	83,860
Total equity and liabilities		1,179,384	1,243,382	965,583

1. Accounting for Build Operate Transfer agreements

The majority of the company's construction projects are Build Operate Transfer (BOT) agreements. Under such agreements, Puroco develops a water treatment plant at its own cost on behalf of the grantor, in exchange for the concession to operate it for a specified period of time, typically 25 years. During this concession period, Puroco has the right to supply purified water to users within the vicinity of the plant, and to charge the users for this. At the end of the concession period the plant is transferred to the grantor usually for a small sum or zero payment.

During the construction period, cost incurred are recognised in the statement of profit and loss as contract costs. Cost includes all expenditure related directly to the project and an allocation of fixed and variable overheads incurred in the company's contract activities based on normal operating capacity.

The amount of revenue recognised on contracts during the financial year is based on an estimate of the degree of completion of each project based on an engineer's report. Revenue recognised during a period is shown as "construction" in the statement of profit and loss. As revenue is recognised, a corresponding amount is recognised as construction contract balances in the statement of financial position.

The transaction price for the purposes of revenue recognition is the fair value of the concession agreement, which is the discounted future net cash flows that the concessions will generate. The future cash flows are forecast by management and are based on conservative estimates so that it is highly probable that management will not be required to reverse these when the plants are complete, and the actual cash flows are known with certainty.

On completion of a project, all amounts included in the construction contract balances in respect of the project are transferred to "Service Concession Agreements", an intangible asset in the statement of financial position. This is amortised over the life of the concession on a straight line basis and is tested annually for impairment.

The plants are not recognised under Property, plant and equipment as they are controlled by the Grantor, not by Puroco.

2. Construction revenue

	2020 $000	2019 $000	2018 $000
Qatar water desalination plant	–	–	125,000
China - water recycling plants	40,000	80,000	25,000
Tunisia - waste water plant	–	170,000	70,000
Singapore - Power plant	20,000	–	–
Other projects	20,000	–	25,000
	80,000	250,000	245,000

3. Other income

	2020 $000	2019 $000	2018 $000
Consideration in respect of sale of assets	265,400	–	–
Carrying value of assets disposed	(230,400)	–	–
Other income	35,000	–	–

During the year ended 31 Dec 2020, the company sold the rights to the concession in Tunisia to Eau de France, a multinational water company.

4. Property, plant and equipment

	As at 31 December		
	2020 $000	2019 $000	2018 $000
Carrying amount:			
Buildings	20,807	26,328	21,430
Plant & machinery	6,606	7,423	5,609
Equipment	1,400	1,750	1,645
Total	28,813	35,501	28,684

5. Service concession agreements

	2020	***2019***	***2018***
	$000	*$000*	*$000*
Cost/ value			
At 1 January	1,070,000	830,000	680,000
Add transferred from Construction contracts	170,000	240,000	150,000
Less sold	(240,000)	–	–
At 31 December	1,000,000	1,070,000	830,000
Amortisation of service concession contracts			
At 1 January	(158,400)	(115,600)	(82,400)
Amortisation for the year	(40,000)	(42,800)	(33,200)
Less amortisation of sold assets	9,600	–	–
At 31 December	(188,800)	(158,400)	(115,600)
Carrying value at 31 December	811,200	911,600	714,400

6. Development costs

	As at 31 December		
	2020	***2019***	***2018***
	$000	*$000*	*$000*
Costs	48,000	48,000	48,000
Accumulated amortisation	(22,000)	(17,000)	(12,000)
Carrying amount	26,000	31,000	36,000

Development costs relate to the costs incurred in developing the Klearer ultrafiltration membranes. Amortisation of development costs is included within Operations and maintenance costs.

Costs incurred in research related to Klearer II have all been included within Research and Development costs in the Statement of Profit and Loss.

7. Construction contract balances

	As at 31 December		
	2020	***2019***	***2018***
	$000	*$000*	*$000*
Balance b/f	130,000	120,000	25,000
Add revenue	80,000	250,000	245,000
Less transferred to Service concession agreements	(170,000)	(240,000)	(150,000)
Bal c/f	40,000	130,000	120,000

END OF EXHIBIT 5

EXHIBIT 6

Report to the board about the proposed cooperation with Singen

To: The board, Puroco
From: Mr Eugene Chung, COO
Subject: CONFIDENTIAL: Proposed Joint Venture with Singen Corporation
Date: 3 March 2022

Introduction

The Phoenix project (the waste-to-energy plant located in Tuas South) completion date has been rescheduled for November 2025, and this date is still optimistic. This would represent a 2 year delay due to operational and financial difficulties at least in part accelerated by the COVID-19 pandemic.

Singen Corporation is a lead player in sustainable energy creation in Singapore and internationally. A joint venture with Singen Corporation could source the additional funds and skills required to ensure faster completion.

Project background

Puroco is in the midst of building Singapore's largest waste-to-energy plant in Tuas South, known internally as Project Phoenix, which will also be Asia's first integrated water and power project. Designed to process 3,600 tonnes of waste per day and generate 120MW of clean and renewable energy, the plant will have one of the best land utilisation factors in terms of incineration capacity per unit floor area and be one of the most efficient globally in terms of energy recovery per unit of waste incinerated globally. There are synergies to the two plants working together - for example, the food waste from waste plant is combined with used water sludge from the water purification plant, which increases the yield of biogas from the water sludge. This is then used as a source of power in the energy plant.

Following financial and operational difficulties, the project has stalled. Many operational delays have been experienced due to the COVID-19 pandemic, but in addition the power generation side of the project is proving more challenging than was initially anticipated. Puroco's skillset is limited in this area, and our ability to manage contracted

resource has proved problematic due to a lack of understanding on our part of the technical aspects of the power generation side of the plant.

Singen Corporation

Reporting a turnover of S$6.6 billion in 2020, SGX-listed Singen Corporation focuses on four key areas comprising energy and environment, urban development, connectivity and asset management. Its key subsidiaries are:

(i) Singen Offshore & Marine, a world-leading solutions provider in the offshore, marine and energy industries through design, engineering, new builds, conversions, repairs and support services;

(ii) Singen Infrastructure, which invests in, owns and operates competitive environmental and energy efficiency businesses; and

(iii) Singen Renewable Energy, a developer and operator of renewable energy infrastructure through utility-scale wind and solar projects by integrating state-of-the-art technology, energy storage systems and digital asset management.

Proposal

Approximately $120m had been spent to date by 31 December 2021, with a total projected cost of $500m.

The broad terms of a joint venture with Singen would be to invest in a jointly owned new company, as follows:

Build phase:

Puroco – 50% owner: $120m work to date transferred into the Joint Venture, plus $130m cash evenly injected to fund construction costs over the next 18 months. Continued provision of expertise on waste extraction and water processing.

Singen – 50% owner: $250m cash injected into the joint venture on day 1. Expertise on power generation during build phase.

Operational phase:

Shared responsibility between Singen and Puroco, costs reimbursed through the joint venture on a ‘nil margin’ basis, all profits split 50:50. Open book accounting is to be used to verify respective inputs to the JV.

Next steps

Confidential ‘no obligations’ discussions have been held with Singen and they are in basic agreement with the outline terms. Board approval will be required before discussions can begin to be formalised.

I look forward to the Board’s comments.

E Chung, COO

END OF EXHIBIT 6

EXHIBIT 7

Article from "The Straits Business Review" about the water industry in Singapore

Singapore's Water Industry ready to help the world!

Singapore's water industry is well prepared for the challenges that the future brings and is now helping to solve global problems.

Decades of research, aimed at solving Singapore's own demands for water have led to state-of-the-art innovations in treating used water and desalinating seawater. Singapore is now a global leader and is using its position to help solve some of the world's most pressing problems.

The United Nations Sustainable Development Goals includes goal number 6, Clean Water and Sanitation. Throughout the world, one in three people do not have access to safe drinking water according to the UN, and two out of five people do not have a basic hand washing facility. As the global population grows, demand for water will continue to rise.

Problems also exist in the water industry in countries where the supply of water should be plentiful. Climate change brings about intense rainfall, leading to sewer overflows, resulting in pollution of rivers and sea. Other countries are threatened with dwindling water supplies. New contaminants are being detected in water supplies. Water and sewage systems are also old and in need of replacement in many developed countries.

Singapore companies are using their expertise to help in countries where water is scarce. Puroco, for example, has developed mobile water treatment equipment that can be used to purify surface or ground water in areas where a clean supply of fresh water is not available. That company has also been building waste treatment plants and seawater desalination plants throughout Asia, the Middle East and North Africa.

Many academics are talking about the fourth industrial revolution, where data analytics, the internet of things and automation will combine to transform production processes and enable automatic control of processes, identifying problems at an early stage so remedial action can be taken. The Singapore's water industry has not been slow to embrace these technologies. The Integrated Validation Plant at Ulu Pandan has been testing advanced technologies including full automation and data analytics to reduce manpower requirements. The technologies are also more energy efficient, leading to a lower carbon footprint.

Building water plants is a capital intensive programme and recent changes in interest rates mean that water companies need to ensure they have sufficient levels of liquidity and can pay their interest bills. This will be a new challenge going forward.

END OF EXHIBIT 7

EXHIBIT 8

Memo from the Klearer II project manager to the finance department relating to Klearer II project costings up to 31 December 2021

Memo

From: **Klearer II project manager**

To: **Finance department**

Subject: **Klearer II project costings**

Date: **9 January 2022**

As requested, details of the Klearer II project costings, and milestones are given below. In answer to your specific questions:

- The sales and marketing department confirmed on 1 April 2021 that, assuming completion of the project, there is a market for the Klearer II product and the expected price point would be significantly in excess of expected costs.
- The R&D team determined that the project has been successfully completed from a technical perspective on 1 June 2021, and ready to exploit commercially from that date.
- The Board confirmed the availability of resources to complete the project on the same date.

Project timeline and milestones

Timeline	Milestones
1 December 2019	Project confirmed
1 December 2019 – 31 January 2020	Phase 1: research activities to develop ultrafiltration knowledge
1 February 2020 – 31 August 2020	Phase 1: Evaluation of research findings

Timeline	Milestones
31 August 2020	**Milestone 1:** Phase 1 completed - research report / presentation delivery
1 September 2020 – 28 February 2021	Phase 2: Consideration of alternative pressure-driven membrane transport processes
28 February 2021	**Milestone 2:** Phase 2 completed - final process selection
1 March 2021 – 30 September 2021	Phase 3: Design and construction of prototype Klearer II process technology
30 September 2021	**Milestone 3:** Phase 3 completed – initial prototype complete
1 October – ongoing	Phase 4: Refining of prototype technology

Project costings

($'000)	Project staff costs	Administrative costs	Cost of materials	Total
Phase 1	720	110	-	830
Phase 2	680	75	340	1,095
Phase 3	889	85	1,575	2,549
Phase 4	410	25	640	1,075

Notes

- Administrative costs consist primarily of an allocation of support staff costs.
- Costs accrue evenly throughout each Phase of the project.

END OF EXHIBIT 8

EXHIBIT 9

Minutes of Management Committee meeting- March 2022 at which possible cooperation with Singen, and acquisition of EVO is discussed

Extract:

Present: Ms Melissa Wong (MW). Mr Eugene Chung (EC), Ms Liew Khoo (LK), Mr Ben Hoong (BH), Mr Lawrence Tan (LT), Mrs Susan Li (SL)
Apologies: None

Singen Joint Venture

EC summarised the contents of his report outlining the proposed Joint Venture with Singen. SL expressed concern that Singen were essentially competitors as Puroco moves into power generation via this project and sharing business opportunities and IP with competitors was questionable. EC responded by pointing out, with respect, Puroco does not have the required IP in power generation, and this may be an opportunity for Puroco to learn from Singen for future work.

LT noted that the injection of funds in the current circumstances surely overrode most other concerns, and the JV should be pursued on that basis alone. LK disagreed and said despite the circumstances, a long term solution to funding was required that fitted with a logical strategic plan.

MW said she was concerned how sharing the development and operations would work practically given the need to create synergies through the project, and that operating water and power independently would threaten some of these synergies. EC assured MW that this could be managed through the new partnership, but committed to fleshing out details for presentation at the April Management Committee meeting where a decision would need to be made.

EVO

SL tabled the proposed joint research project with EVO, the bottled water supplier, to optimise oxygen levels in EVO drinking water and maximise health benefits. The water could also be potentially used to develop beauty products. In recent years, EVO has been investing heavily in digital transformation by upgrading its customer relationship, human resource and production management systems to prepare for regional expansion and listing on the SGX. It currently has primitive data analytics software to forecast demand.

LT expressed concern about EVO's use of single-use plastic bottles, and the impact this has on the environment, let alone the impact on the Puroco brand. LT asked if single-use plastics packaging could be reconsidered by EVO. SL said the partnership related to water oxygenation only, so Puroco was not in a position to discuss EVOs own packaging policies.

MW suggested the potential purchase of EVO. Given they are looking to list anyway, this could be an alternative way for the current owners to realise their investment. It would represent downstream integration and then Puroco would also be in a position to address the sustainability concerns raised by LT. There was broad agreement to investigate further.

LK agreed to prepare a paper to evaluate the acquisition, and to suggest a suitable valuation, for the next Management Committee meeting.

END OF EXHIBIT 9

EXHIBIT 10

Report prepared by a business strategist, providing information about EVO and why it may be a good acquisition target

To: Mr Eugene Chung, COO, Puroco
From: Cheng Huang, Business Advisor
Subject: CONFIDENTIAL: EVO acquisition
Date: 5 April 2022

Introduction

This report highlights the strategic benefits of Puroco acquiring EVO – a privately owned bottled water company. Valuations are not included at this stage.

Background on EVO

EVO is a successful family owned business, started in 2009. It sells fresh spring water in plastic bottles, and advertises the superior taste and health benefits of mineral rich, pure spring water from several locations around the world. Its main markets are in Singapore and Malaysia. The majority owners (2 brothers each owning 40%) are approaching retirement age, and have been happy with the achieved size and performance of business. However, the other 20% is owned by one brother's daughter, Jie Goh, who is looking to expand by:

- Launching a range of oxygen optimised water at a premium price – this is good for health as it can be quickly absorbed by the body, restore its natural balance and enhance well-being.
- Supplying oxygen balanced water to the beauty treatment industry. For example, the water could help produce a superior emulsion for creams that will be absorbed quickly by the skin.

Jie has been looking for a research partner for the oxygenation process, hence their existing relationship with Puroco. To fund future expansion, Jie would like to consider

listing on the Singapore Exchange and sees this as also providing an exit route for her father and uncle.

Research partnership

A research alliance is a possibility, but it is questionable who would control the developed intellectual property. In addition, EVO has historically packaged their water with single-use plastic bottles. Puroco may not wish to associate with anything that contributes to continuing environmental pollution and damage in this way.

Acquisition

As an alternative, Puroco could acquire the entire share capital of EVO. This has many advantages:

- Unquestioned ownership of the oxygenation intellectual property.
- Follow-on options for Puroco e.g. using recycled/ NEWater as an environmentally conscious alternative to fresh water and use of the EVO brand for other retail products.
- Increased control, for example alternatives to single-use plastics could be found for product distribution.
- Downstream integration: allows some related diversification for Puroco from current operations, reducing risk in the product portfolio.
- Price: Given the majority shareholders are looking to retire, acquisition provides a problem-free exit route for them, so a reasonable price may be obtained by Puroco.

Recommendation

Given the above, I recommend pursuing the option to acquire EVO, subject to a valuation exercise and a satisfactory price being agreed.

Please do not hesitate to contact me if I can be of any further help.

Regards
C Huang
Business Advisor

END OF EXHIBIT 10

EXHIBIT 11

Risk register prepared by the Risk Committee

Extract:

Key risks

Contamination: As a company with water-intensive operations in water-stressed Singapore, Puroco's access to adequate and reliable water supply will always be a concern. Its individual plants are also at risk of deliberate or accidental water contamination, with potentially huge consequences for public health.

Regulatory: Water regulatory requirements often tighten due to water scarcity, conflicts among various needs (e.g. ecological, urban, industrial) or when the public perceives a company's water use or discharges as wasteful, harmful or inequitable. In addition to the various PUB water policies and government plans already in place, Puroco will have to adhere to stricter sustainability-related reporting laws by global institutions like the Sustainability Accounting Standards Board (SASB), the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD) to ensure full accountability to stakeholders. For its latest ultrafiltration membrane, it also has to look into the legal rights, restrictions and inherent risks associated with applying for another IP.

Reputational: Reputational risks stem from diminished stakeholder perceptions caused by inefficient or harmful production activities (or products) that have (or are perceived to have) negative water-related impacts, leading to decreased brand value and consumer loyalty. For example, the public relations (PR) implications of Puroco's potential involvement with EVO will have to be considered carefully, due to the growing global aversion to single-use plastic water bottles.

END OF EXHIBIT 11

EXHIBIT 12

Suggestions for further research

Further research

The following resources may be useful when beginning your research into the case study company. As always, the caveat is to read everything with a healthy dose of scepticism and apply professional judgment. Just because an article is on this list, does not give it legitimacy or relevance. All links were active as at 13 December 2021.

Exhibit 2

Global-is-Asian, The Lee Kuan Yew School of Public Policy online digital platform
https://lkyspp.nus.edu.sg/gia
[Accessed 1 February 2022]

PUB (2021) *Singapore Water Story.* [Online]. Available from:
https://www.pub.gov.sg/watersupply/singaporewaterstory
[Accessed 13 December 2021]

IWA (2021) *Turning Isolation into Opportunity.* [Online]. Available from:
https://iwa-network.org/city/Singapore
[Accessed 13 December 2021]

PUB (n.d.) *Living Water* [Online]. Available from:
https://www.pub.gov.sg/globalhydrohub/funding/livinglab
[Accessed 13 December 2021]

PUB (n.d.) *Funding* [Online]. Available from:
https://www.pub.gov.sg/research/industrialwatersolutions/funding
[Accessed 13 December 2021]

Enterprise Singapore (2021) *Enterprise Development Grant.* [Online]. Available from:
https://www.enterprisesg.gov.sg/financial-assistance/grants/for-local-companies/enterprise-development-grant/overview
[Accessed 13 December 2021]

Exhibit 3

Audrey Tan (2021) Budget debate: *Per capital daily use of water shot up in 2020 as more people stayed at home* [The Straits Times] Available from:
https://www.straitstimes.com/singapore/budget-debate-as-more-people-stayed-at-home-per-capita-daily-use-of-water-shot-up-in-2020
[Accessed 13 December 2021]

Smartwatermagazine (n.d.) *Trends for 2021 that will redefine the future of the water industry* [Online] Available from https://smartwatermagazine.com/news/idrica/trends-2021-will-redefine-future-water-industry [Accessed 13 December 2021]

IWA (n.d.) *5 major trends impacting the Water industry in the next decade* [Online] Available from: https://iwa-network.org/five-major-challenges-and-emerging-trends-impacting-the-water-industry-in-the-next-decade/ [Accessed 13 December 2021]

Exhibit 4

IAS plus (n.d.) IFRIC 12 - Service Concession Arrangements [Online] Available from *https://www.iasplus.com/en/standards/ifric/ifric12* [Accessed 13 December 2021]

Exhibit 5

IRAS e-Tax Guide *Research and Development Tax Measures (sixth edition).* [Online].Available from https://www.iras.gov.sg/media/docs/default-source/e-tax/research-and-development-tax-measures-etax-guide_6th-edition.pdf?sfvrsn=1f38a2e8_15.%20Final%20column%20=%202.5%20times%20the%20total%20qualifying%20cost [Accessed 13 December 2021]

Exhibit 7

United Nations (n.d) *Sustainable Development Goals - 6 Clean Water and Sanitation* [Online] Available from: https://www.un.org/sustainabledevelopment/water-and-sanitation [Accessed 13 December 2021]

3blmedia (2019) *Singapore's Advanced Wastewater Treatment Process, Digital Capabilities Win Engineering Award* [Online] Available from: https://www.3blmedia.com/News/Singapores-Advanced-Wastewater-Treatment-Process-Digital-Capabilities-Win-Engineering-Award [Accessed 13 December 2021]

Doug Hatler (2020) *Industry 4.0 & the Water Sector* [Online]. Available from: https://waterfm.com/industry-4-0-the-water-sector [Accessed 13 December 2021]

Diligent Insights (n.d.) What is Environmental, Social and Corporate Governance (ESG)? [Online]. Available from https://insights.diligent.com/esg/ [Accessed 13 December 2021]

END OF EXHIBIT 12

END OF ADVANCE INFORMATION