



PNG LNG Environmental and Social Report – Annual 2017

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About this Report

This Papua New Guinea Liquefied Natural Gas (PNG LNG) Environmental and Social Report – Annual 2017 provides information about ExxonMobil PNG Limited's safety, health, environment and social management progress during production.

It forms part of PNG LNG's commitment to ensuring the Government and citizens of Papua New Guinea, interested non-government organisations and other stakeholders are kept well informed of production activities.

This Report is available on the PNG LNG website, www.pnglng.com. Printed copies are also available.

Cover image: Operations Technician, Barbara Kipak, from the third intake of Operations and Maintenance trainees at the LNG Plant Marine Terminal.

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PNG LNG is operated by a subsidiary of ExxonMobil in co-venture with:



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Utilities Technician, Jonathan Bebege and Mechanical Technician, Junias Warpin at the LNG Plant Marine Terminal

Executive summary

“Our operations continue to perform at exceptional levels of reliability. We have had another great year because of the collective support and hard work of our workforce, co-venturers, suppliers, landowners and government.”

Andrew Barry, Managing Director,
ExxonMobil PNG Limited

ExxonMobil PNG Limited (EMPNG) has safely produced more than 27 million tonnes of Liquefied Natural Gas (LNG) and delivered 374 LNG cargoes since production began.

EMPNG’s facilities safely operated at 20 percent above the original design capacity in 2017, with more than 8.2 million tonnes of LNG produced, compared to the original capacity of 6.9 million tonnes per annum. A total of 110 LNG cargoes were delivered to customers in Asia during 2017.

374
LNG cargoes
delivered to
customers

A subsidiary of Exxon Mobil Corporation, EMPNG manages the operation of the Papua New Guinea (PNG) LNG production facilities on behalf of co-venture partners: Oil Search Limited, Kumul Petroleum Holdings Limited, Santos Limited, JX Nippon Oil and Gas Exploration Corporation, Mineral Resources Development Company Limited and their affiliates.

This Environmental and Social Report provides a progress update on EMPNG's social and environmental performance from 1 January – 31 December 2017.

Up Close: Papua New Guinea earthquake

On 26 February 2018, a 7.5 magnitude earthquake struck Papua New Guinea's Highlands Province.

EMPNG supported relief efforts for the many communities who lost loved ones and property in the earthquake. This included working with local communities and relief agencies to provide essential supplies and re-establish health facilities and food gardens impacted by the earthquake. The company also provided resources to help the Papua New Guinean Government address the significant task of restoring roads in the Highlands region. EMPNG's parent company, Exxon Mobil Corporation donated US\$1 million (nearly PGK3.5 million) to support the humanitarian relief effort.

EMPNG was able to quickly account for all the company's employees and contractors at Upstream facilities following the earthquake and confirmed that all workers on-site were safe.

EMPNG Managing Director, Andrew Barry, said the company withstood the earthquake extremely well because of the high quality design and construction of the facilities and the quick response by workers.



"The initial rapid response by our workforce enabled us to keep people safe, minimise damage to equipment and ensure there was no release of hydrocarbons.

We are now committed to supporting the long-term recovery of earthquake-impacted communities around the Hela, Southern Highlands and Western provinces and will continue working closely with relief agencies and the National Disaster Centre in efforts to rebuild these communities."

Andrew Barry
Managing Director,
EMPNG



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Production

EMPNG recorded an industry-leading production reliability with less than one percent unscheduled downtime during 2017.

Two production milestones were achieved in May, with delivery of the 300th LNG cargo and 1 trillion cubic feet of gas produced from the Hides Gas Conditioning Plant (HGCP) since production began.

EMPNG has started work on Phase 2 of PNG LNG, known as the Angore Gathering System. Located in the Upstream area within the Hela Province, the Angore Gathering System will consist of surface facilities and approximately 11 kilometres of pipelines that connect the two production wells installed at Angore Wellpad A to the HGCP. Pre-construction surveys commenced in June 2016 and construction began in early 2017. Production is expected to commence in 2019.

In November, EMPNG Managing Director, Andrew Barry, opened a new 'Building One – One Team' office at the LNG Plant site to enable greater collaboration among the Operations, Maintenance, Engineering, Warehouse, Laboratory and IT teams in a centralised work environment.

Safety and health

The LNG Plant has achieved a milestone of more than 10 million hours worked without a Lost Time Incident since the start of production. The LNG Plant also completed two significant maintenance campaigns for the refrigeration gas turbines, with more than 75,000 hours worked without a recordable injury.



Operations Technician, Janeth Gurame, at the HGCP

Upstream area teams achieved 263 consecutive days without a recordable injury in 2017.

Emergency equipment has been upgraded in worksite clinics with the purchase of six new portable multi-purpose defibrillators and monitors, and an upgraded SimMan® patient simulator mannequin specifically designed for medical training. A new Papua New Guinean doctor was appointed to the HGCP clinic during 2017.



Celebrating the 300th LNG cargo delivery at the LNG Plant

EMPNG continues to maintain the 'Partnership in Health' agreement with the Papua New Guinea Institute of Medical Research. A key component of the agreement is the integrated Health Demographic Surveillance System (iHDSS), which has been used to monitor the impact of PNG LNG on the health of communities within Hiri and Hides between 2007 and 2017. The Papua New Guinea Institute of Medical Research completed a review of the iHDSS during 2017 with support from EMPNG. The review found no significant change in underlying morbidity patterns as a result of PNG LNG.

It concluded that the iHDSS had provided comprehensive health data regarding illness and death patterns in Papua New Guinea that could be used by the National Department of Health to identify and target specific intervention programs to improve health outcomes in the country. It also found that educational attainment, particularly for women, improved in Hiri, while some positive economic consumption changes, such as the use of bank accounts and purchase of improved housing materials, were recorded in both Hiri and Hides.

EMPNG continued its partnership with the Texas Children's Hospital during 2017, with a focus on maternal and child health, improving healthcare education and strengthening the public health program in Papua New Guinea.

Environment

In partnership with ecosystem management specialist Biotropica Australia and the Papua New Guinea National Agricultural Quarantine and Inspection Authority, EMPNG launched *Exotic Plants of the Kikori River Basin* during 2017. The book aims to help identify invasive weed species in the Kikori River Basin. Along with 800 copies of the book, EMPNG has provided weed identification cards to the Authority to support invasive species awareness with their inspection teams.

In March, some 55 Papua New Guinean conservation representatives attended a Communicating Conservation Practice in Papua New Guinea workshop. The workshop covered topics such as the protection of endemic species, the trade of endemic and other endangered species and the management of crocodiles in the Sepik River.

As part of EMPNG's biodiversity offset program, the University of Papua New Guinea has finalised course programs for a Postgraduate Diploma and a Master's degree in Conservation Management in partnership with EMPNG and the Mama Graun Conservation Trust Fund. Two conservation certificate courses were delivered in 2017, with the first involving 25 participants from the Kokoda Initiative. The first four scholarships for the new Master's degree in Conservation Management were awarded in December.

EMPNG held a workshop at the LNG Plant during 2017 to examine the company's long-term Waste Management Strategy for sustained 30-year operation. The workshop included discussions on potential commercial opportunities and improvements to solid waste and wastewater disposal methods.

EMPNG also reached an agreement with Oil Search Limited for both companies to support each other with managing waste in the Upstream area. As part of the agreement, Oil Search Limited is helping process EMPNG waste from Moro B Camp.

Workforce development

By the end of 2017, 2580 employees and contractors were working in production-related roles with EMPNG. Over 2100 of these were Papua New Guinean citizens, who comprised 82 percent of the workforce. Third party contractors represent 70 percent of the production workforce, with nearly 90 percent of contract workers being Papua New Guinean.

2580
workers in
production roles

The fourth intake of 16 trainees began the Operations and Maintenance training program at the Kumul Petroleum Academy in January and completed junior technician requirements in December. They will begin work at EMPNG facilities in January 2018, with nine working in operations, three in instrumentation, three in mechanical and one as an electrical technician. This is the first intake of trainees to be sponsored by EMPNG to complete their training through the Kumul Petroleum Academy.

Previous Operations and Maintenance training program intakes were trained in Canada, Malaysia and Australia.

During 2017, the equivalent of 80,200 hours of training were delivered to some 7890 employee and contractor participants through 2154 courses.

More than 90 percent of all training hours were delivered to Papua New Guinean citizens. Contractors achieved a milestone with the equivalent of 100,000 hours of training delivered since the start of production.

80,200
training hours
delivered

Supporting Papua New Guinean businesses

Twelve landowner companies (Lancos) and some 200 non-Lanco Papua New Guinean businesses are engaged by EMPNG for production-related activities.

Lancos provide services such as labour hire, transportation, maintenance and vegetable supplies, while non-Lanco businesses provide security, freight and logistics, maintenance supplies, medical and other services.

During 2017, EMPNG's total in-country spend with Papua New Guinean businesses was more than PGK477.5 million (US\$147.8 million). Of this, almost PGK129.3 million (US\$40 million) was spent on Lanco services.

Since the start of production, EMPNG has spent almost PGK2.3 billion (US\$705 million) on Papua New Guinean services, with PGK581.6 million (almost US\$180 million) spent with Lancos.

Ninety small and medium-sized enterprises (SMEs) participated in the Enterprise Centre's third biennial SME Leadership Awards in October.

The Awards recognise Papua New Guinea's best performing SMEs in categories such as governance, business management, quality control, assets management, corporate image and safety, health and environment.

A new award category, 'Best Woman Owned SME', was introduced in 2017 to recognise women in business.

The inaugural Best Woman Owned SME Award went to Maryelz Orchid Inbloom Limited, while Nares Engineers Limited was named the 2017 Overall Top Performing SME. Businesses participating in the SME Leadership Awards had completed business assessments through the Enterprise Centre during 2016 and 2017.

The Enterprise Centre delivered the equivalent of 6718 training days during 2017 to Lancos, women-owned business and other Papua New Guinean businesses, with funding support from EMPNG. They also conducted 56 business assessments during 2017, including 30 Lanco assessments and seven for women-owned businesses.

More than 860 Papua New Guinean entrepreneurs sought assistance through the Enterprise Centre in 2017, with almost 19,000 entrepreneurs supported since the Centre opened in 2010. The equivalent of 32,000 training days and 489 business assessments have been conducted at the Centre to date.

2.3
billion Kina
spent on Papua
New Guinean
services



Radio Operator, Doko Auda from Lanco Laba Security Services Limited, at the LNG Plant operations centre



Members of the Papua New Guinean national parliament and Chamber of Mines and Petroleum representatives at the LNG Plant

Social development

During 2017, EMPNG spent PGK44.8 million (US\$13.9 million) on community investment programs that encompassed education, health, community infrastructure and environmental projects.

44.8
million Kina
invested in
communities

During the year, infrastructure was provided to three LNG Plant site villages, with the handover of the Lea Lea Community Centre, a new double classroom for Papa Preschool and a new Women's Resource Centre in Boera Village.

In the Upstream area, a fully refurbished health centre was provided in Baguale Village, five classrooms were refurbished at Juni Primary School and a new double classroom was handed over to Kikori Primary School.

Furniture, consisting of school desks, chairs and teacher's tables, were donated to nine schools in the LNG Plant site villages during the year. The furniture donations will improve the learning environment for students.

EMPNG has also signed a funding agreement with the Central Provincial Government to implement the School Board of Management training program in Central Province schools.



EMPNG Managing Director, Andrew Barry and Central Provincial Administrator, Gei Guni Raga signing the School Board of Management funding agreement

The training program is based on the *School Board of Management Training Manual*, which was funded by EMPNG in partnership with the Central Provincial Government in 2016. It aims to improve board governance and leadership capabilities in schools.

The current EMPNG donation will enable the training to be delivered to school boards of management over the next two years and will include a train-the-trainer component, along with monitoring and evaluation of lessons learned from the Manual.

Additionally, the company is supporting the expansion of the School Board of Management training program to Hela Province schools.

EMPNG continues to support projects that help the livelihoods of local communities. For example, approximately 250 households involved in EMPNG's community livelihood improvement project produced almost 30 tonnes of fresh fruit and vegetables, which earned them more than PGK55,000 (US\$17,022) at market days during 2017.

In October, more than 2000 people attended International Youth Day celebrations in Pimaga in the Southern Highlands Province. The 2017 International Youth Day theme was 'Youths for Peace'.

During the celebrations, the Kuige Youth Training and Development Centre was officially opened. The Centre provides technical training for youths in carpentry, electrical and mechanical skills. It also aims to provide access to distance education for Grades 7 to 10 under the Papua New Guinean Government's Flexible Open and Distance Education Program.

Stakeholder and community engagement

Following Papua New Guinea's national election, 34 members of the new parliament received a guided tour of the LNG Plant site in August as part of the Members of Parliament orientation week.

In September, the first royalty payments of over PGK15 million (US\$4.6 million) were paid to 90 landowner clan accounts in the LNG Plant site area as part of the Umbrella Sharing Agreement between the State and landowners, which provides for the sharing of benefits from LNG production.

EMPNG continues to engage with communities to keep them informed about production activities and to collaborate on community support programs.

Since the start of production, EMPNG has conducted almost 30,000 engagements with stakeholders in some 230 communities, including more than 23,000 informal engagements and almost 7000 formal engagements.

30,000
engagements in
230 communities



Papa Primary School students with their road safety awareness brochures presented during a community engagement

During 2017, the company conducted 2229 formal engagements and 4836 informal engagements in 205 communities. These engagements involved more than 53,450 attendees. Topics covered included community development support programs, the Angore Gathering System and road and marine safety.

EMPNG remains focused on building a strong foundation that will help increase jobs for Papua New Guineans, improve local business opportunities, expand community development and contribute to increased government revenues for the long term.



“We have a big job ahead of us to capture the next round of opportunities. With the support of all our partners and stakeholders we are confident we can achieve our shared vision for the future.”

Andrew Barry
Managing Director,
EMPNG



The LNG Plant Marine Terminal in Caution Bay is used for loading an average of nine LNG cargoes each month

1 Overview

This PNG LNG Environmental and Social Report – Annual 2017 provides an update on the progress of production activities from 1 January to 31 December 2017.

ExxonMobil PNG Limited (EMPNG) operates the US\$19 billion Papua New Guinea Liquefied Natural Gas (PNG LNG) gas production and processing facilities, which began production on 23 April 2014. The facilities are located in the Southern Highlands, Hela, Western, Gulf and Central provinces of Papua New Guinea.

More than 700 kilometres of pipeline connect the PNG LNG facilities that include a gas conditioning plant in Hides and liquefaction and storage facilities near Port Moresby. These facilities have the capacity to produce around 8.2 million tonnes of LNG per year, which is approximately 20 percent above the original design capacity of 6.9 million tonnes per annum.

The location of PNG LNG facilities are shown in Figure 1.1.

Approximately 325 billion cubic metres of LNG are anticipated to be produced over the 30 year life of the facilities to provide a long-term supply to Asia Pacific region customers including: China Petroleum and Chemical Corporation (Sinopec); Osaka Gas Company Limited; JERA Company Inc.; and CPC Corporation, Taiwan.

This Report, along with previous Environmental and Social Reports can be found on the PNG LNG website.



Visit the website at www.pnglng.com

Printed copies and translated summaries are made available to Papua New Guinean citizens who may have limited access to the internet.

1.1 Production update

EMPNG has safely produced more than 27 million tonnes of LNG and delivered 374 LNG cargoes since production began. More than 8.2 million tonnes of LNG was produced and 110 cargoes delivered during 2017. This is approximately 20 percent above the original design capacity of 6.9 million tonnes per annum. EMPNG recorded an industry-leading production reliability with less than one percent unscheduled downtime in 2017.

Work also continued on the Angore Gathering System as outlined in *Case study: Angore Gathering System project*.

Hides Gas Conditioning Plant

In May, the Hides Gas Conditioning Plant (HGCP) achieved a milestone with 1 trillion cubic feet of gas produced since production began. The HGCP continues to meet the gas supply needs of the LNG Plant and is providing condensate to Oil Search Limited. Condensate production remained steady throughout 2017.

In May, maintenance was conducted on the HGCP compressors and pigging was undertaken on the Hides Spine in September.



Plate 1.1 – Aerial view of the HGCP gas processing units and pipeline compressor units

Drilling

No drilling activities were conducted during 2017.

LNG Plant

The LNG Plant continues to safely operate above design capacity because of equipment reliability, engineering optimisation and operator surveillance. The LNG Plant also continues to provide a reliable electricity supply to PNG Power Limited.

In May and October, significant maintenance campaigns were conducted on the LNG Plant's 10 refrigeration gas turbines. Operations and Maintenance technicians were involved in both campaigns, which included the opportunity for the first onsite upgrade of the turbines.

Engineering optimisation of naphtha production resulted in 11 naphtha cargoes sold to customers in Asia during 2017.

In November, EMPNG Managing Director, Andrew Barry, opened a new 'Building One – One Team' office at the LNG Plant site.



Plate 1.2 – Workers participating in the official opening of the 'Building One – One Team' office at the LNG Plant

The office creates a unique workplace, which enables greater collaboration among the Operations, Maintenance, Engineering, Warehouse, Laboratory and IT teams in a centralised work environment. It includes a conference room and three huddle rooms for work teams. The building is located close to the maintenance and warehouse buildings, laboratory and central control room to enable easy access for all team members.

Marine facilities

In May, EMPNG celebrated the delivery of the 300th LNG cargo since production began. By the end of December, 374 cargoes had been delivered to customers in Asia.

As a result of higher production rates at the LNG Plant, additional charter vessels continue to be engaged to transport extra LNG cargoes. EMPNG currently has five LNG carriers in service, which includes the *Papua*, *Kumul*, *Spirit of Hela* and *Gigira Laitebo*. The fifth vessel, *Velikiy Novgorod*, has been engaged on a short-term charter to support the delivery of extra LNG cargoes.



Community engagement for the Angore Gathering System project

Case study

Angore Gathering System project

EMPNG has started work on Phase 2 of PNG LNG, known as the Angore Gathering System.

Located in the Upstream area within the Hela Province, the Angore Gathering System will consist of surface facilities and approximately 11 kilometres of pipelines that connect the two production wells installed at Angore Wellpad A to the HGCP, as shown in Figure 1.1.

The Angore pipelines will predominately be installed within the existing PNG LNG pipeline Right of Way (ROW) easement located between Angore and the HGCP. Only 1.3 kilometres of the Angore pipeline will be constructed through secondary regrowth forest. Surface facilities to be installed at Angore Wellpad A are similar to those installed at the Hides Wellpads and will include a wellhead tree, piping and valves, a hydraulic power system, a wellpad vent system and an equipment room.

During development, the Angore Gathering System has been employing a small construction workforce. National workers have been recruited from nearby locations.

Pre-construction surveys for the Angore Gathering System commenced in June 2016.

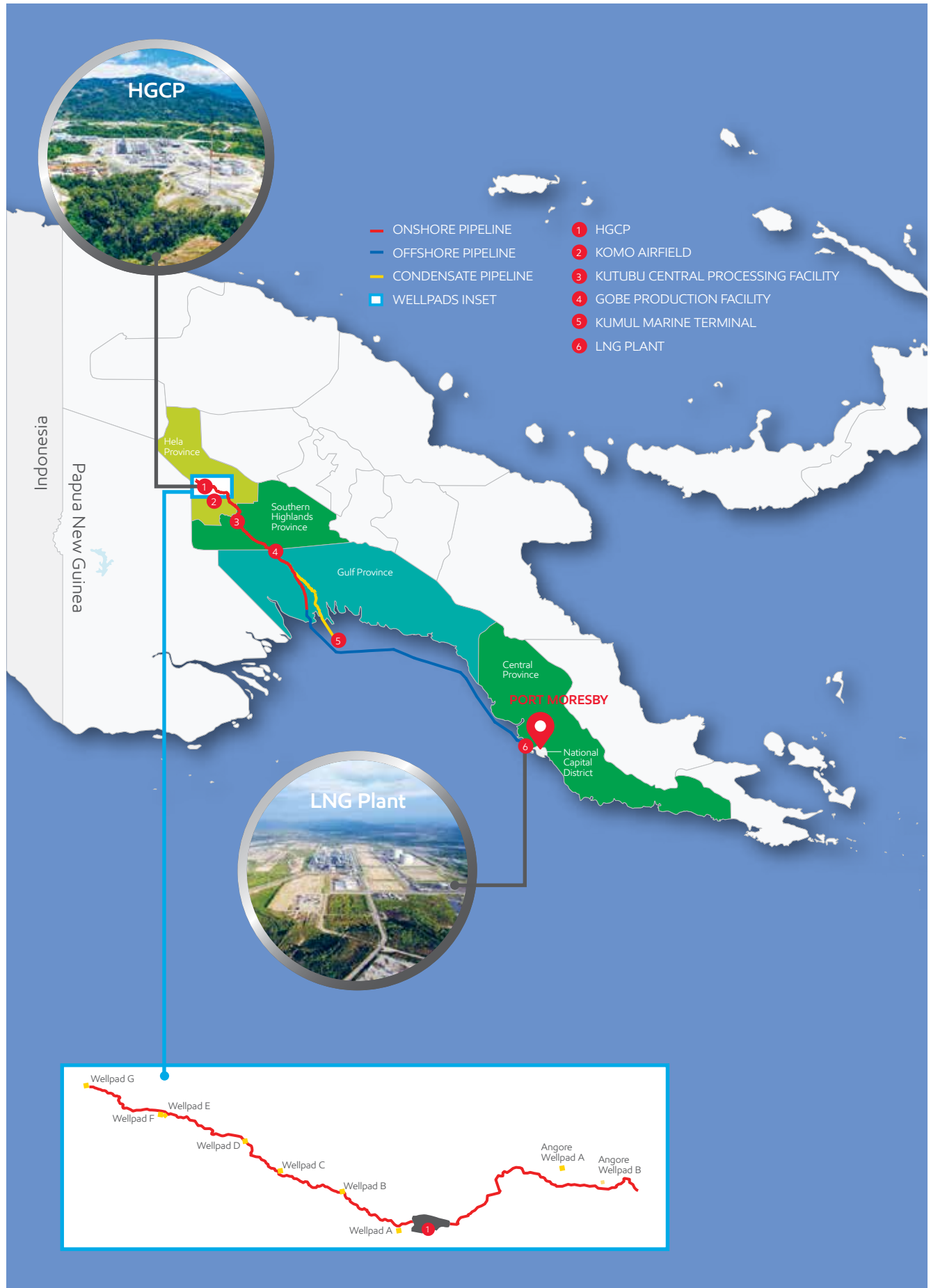
Construction works began in early 2017 and production is expected to commence in 2019. EMPNG is taking all appropriate measures, in accordance with the relevant Environmental and Social Management Plans, to reduce potential adverse environmental and social impacts resulting from the construction and commissioning of the project.

Consultation with affected communities and households in the Angore area began in 2012 during Phase 1 construction activities and continued during the drilling program and throughout readiness for Phase 2. Specific consultations regarding Phase 2 began in March 2016 so that communities could ask questions and receive responses to their enquiries about the construction program.

Seven households directly affected by land acquisition for the Angore Gathering System have received compensation. This includes one household for physical and economic displacement, with the other six households compensated for economic displacement.

PNG LNG facilities

Figure 1.1





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Papua New Guinea's southern crowned pigeon (Goura scheepmakeri), is the world's largest pigeon and is listed as vulnerable by the International Union for Conservation of Nature

2 Environmental and social framework

EMPNG operates in accordance with requirements of the Production Environmental and Social Management Plan (ESMP) to protect the wellbeing of workers, communities and the environment in and around production facilities.

2.1 Approach

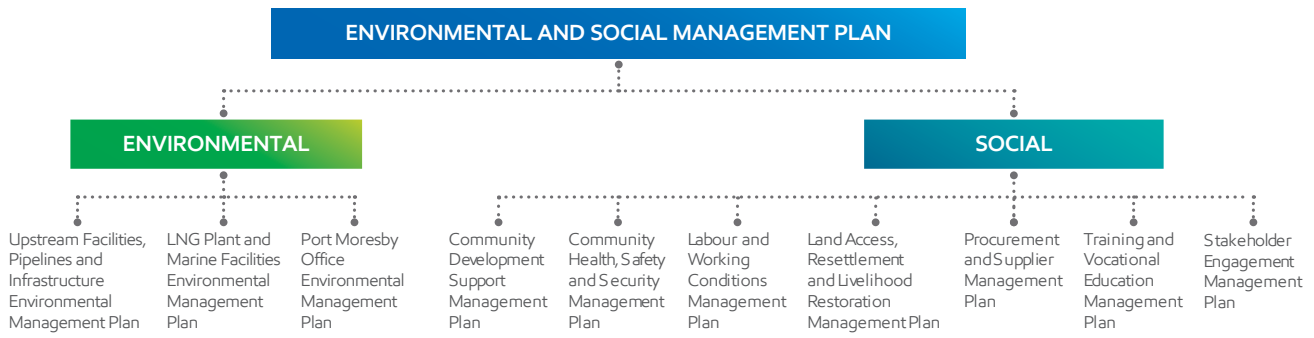
The Production ESMP incorporates lessons learned from the construction phase, requirements of ExxonMobil's Operations Integrity Management System and the International Finance Corporation Performance Standards.

The ESMP consists of three Environmental Management Plans and seven Social Management Plans, as shown in Figure 2.1. The Environmental Management Plans align geographically to production facilities, while the Social Management Plans are based on key social themes.

The ESMP's requirements, and those of its supporting management plans, apply during normal operating conditions and in reasonably foreseeable abnormal operating conditions or emergency situations.

Production Environmental and Social Management Plan structure

Figure 2.1



The ESMP can be viewed on the PNG LNG website.



Visit the website at www.pnglng.com

EMPNG periodically updates the ESMP in consultation with key stakeholders to meet ongoing operational, environmental and social needs.

2.2 Management of Change

EMPNG's Management of Change process operates in accordance with Exxon Mobil Corporation's Operations Integrity Management System framework. The Management of Change process is used to manage temporary or permanent modifications to facilities and changes to previously approved documents.

Prior to any proposed change, requirements such as health, safety, security, environmental and social management, operability and maintenance, regulatory compliance, cost and scheduling must be considered.

Changes are classified according to how they need to be managed. Class I changes require Lender Group review before implementation, while Class II changes involve Lender Group notification in the PNG LNG Environmental and Social Report.

In July, approval was obtained for a Class I change to allow the Hides Waste Management Facility to also provide waste management services to Oil Search Limited in the Hides area.



Enterprise Centre Executive Director, Johnson Pundari reviews a marketing plan with EMPNG General Manager – National Content, Susil Nelson-Kongoi

3 Procurement and supply

Local suppliers are used wherever possible for the procurement of goods and services for production activities. The Enterprise Centre is supporting the development of Papua New Guinean businesses.

3.1 Supplier development

Twelve landowner companies (Lancos) and some 200 non-Lanco Papua New Guinean businesses are engaged by EMPNG for production-related activities.

Lancos provide services including labour hire, transportation, maintenance, container freighting, fuel distribution and vegetable supplies. Non-Lanco businesses provide services such as security, transportation of personnel, freight and logistics, customs clearance, food supply, maintenance supplies, surveying, construction material testing and medical services.

During 2017, EMPNG's total in-country spend with Papua New Guinean businesses was more than PGK477.5 million (US\$147.8 million). Of this, almost PGK129.3 million (US\$40 million) was spent on Lanco services.

Since the start of production, EMPNG has spent almost PGK2.3 billion (US\$705 million) on Papua New Guinean services, with PGK581.6 million (almost US\$180 million) spent with Lancos. The production-to-date spend reported in 2017 increased by PGK615.4 million (US\$190.5 million) compared to information previously reported. This is due to the addition of data regarding in-country spending by foreign owned companies.



Plate 3.1 – EMPNG Warehouse Supervisor, Kris Busina with Warehouse Operator, Aeari Pune from Lanco Laba Holdings Limited, at the LNG Plant warehouse

3.2 Enterprise Centre

Ninety small and medium-sized enterprises (SMEs) participated in the Enterprise Centre’s third biennial SME Leadership Awards in October. The Awards recognise Papua New Guinea’s best performing SMEs in categories such as governance, business management, quality control, asset management, reputation and image, and safety, health and environment. A new award category, ‘Best Woman Owned SME’, was introduced in 2017 to recognise women in business.



Plate 3.2 – Enterprise Centre IT Coordinator, Matthew Hapaeakola with Enterprise Centre Manager, Alfred Pungump

The inaugural Best Woman Owned SME Award went to Maryelzs Orchid Inbloom Limited, while Nares Engineers Limited was named the 2017 Overall Top Performing SME, as described in further detail in *Case study: Building local businesses*.

Businesses participating in the SME Leadership Awards had completed business assessments through the Enterprise Centre during 2016 and 2017.

The Enterprise Centre also released the fifth edition of *Business Assessment Magazine*, which features profiles of companies assessed in 2016 and 2017.

Fifty-eight small business owners participated in a motivational seminar held at the Enterprise Centre in November. Renowned local economist, author and motivational speaker, Tiri Kuimbukal, facilitated the seminar, which aimed to help business owners achieve greater focus to make better strategic decisions for successful business outcomes.

The Enterprise Centre conducted 56 business assessments during 2017, including 30 Lanco assessments and seven for women-owned businesses. This brings the total assessments to 489 since the Centre was established in 2010. Business assessments help local companies identify gaps in their business processes and develop business improvement plans to strengthen their management and operational capabilities.



Plate 3.3 – The fifth *Business Assessment Magazine* released by the Enterprise Centre

The equivalent of 6718 training days were delivered during 2017 to Lancos, women-owned business and other Papua New Guinean businesses, with funding support from EMPNG. By December, the Enterprise Centre had delivered the equivalent of 32,000 training days since it opened in 2010. The Enterprise Centre also supported more than 860 Papua New Guinean entrepreneurs in 2017, with almost 19,000 entrepreneurs supported to date.



EMPNG Executive Director – Production, Dinesh Sivasambo presenting at the Enterprise Centre SME Leadership Awards

Case study

Building local businesses

Some 500 Papua New Guinean businesses are using the Enterprise Centre’s business advisory and mentoring services, along with support from EMPNG, to grow their capacity.

Among companies that have benefited from the Enterprise Centre’s services are Nares Engineers Limited and Maryelz Orchid Inbloom, which were both recognised at the biennial SME Leadership Awards during 2017.



Nares Engineers Limited Managing Director, Francis Kunuma receives the 2017 SME Leadership Award for Overall Top Performing SME from EMPNG Executive Director – Production, Dinesh Sivasambo

Nares Engineers Limited is an inspection company that provides non-destructive testing that includes x-ray, ultrasonic, magnetic particle, dye penetrant and macro testing, as well as statutory inspection services, to the mining, petrochemical, food processing and construction industries.

The company, which was incorporated in 2008, won the 2017 SME Leadership Award for Overall Top Performing SME for being the best performing business among 10 finalists.

Nares Engineers Limited management has been working with the Enterprise Centre and EMPNG to build capacity in areas such as financial management. Their dedication to success has enabled the company to grow a customer base that includes EMPNG, Woodgroup PSN, Talisman Energy and Ok Tedi Mining Limited.

For example, Nares Engineers Limited is providing confined space safety monitoring services for EMPNG’s facilities including LNG vessels and the onshore pipeline.

Case study

Building local businesses

Managing Director, Francis Kunuma, said the business assessment and training support provided by the Enterprise Centre, as well as guidance provided through EMPNG, had enabled his company to streamline and improve its operations through better business management.

Francis said Nares Engineers Limited was a fairly young business, so competing with major inspection and non-destructive testing service providers from overseas that had already established themselves in Papua New Guinea was a challenge.



“Our biggest challenge is the training and up-skill of our staff to keep up with changes in inspection and non-destructive testing technology. We have to send them overseas because training in this field is not provided locally.

With guidance from the Enterprise Centre, we developed a business management system that meets the required international standard, which enables us to provide services to large international companies.”

Francis Kunuma
Managing Director,
Nares Engineers Limited

Maryelz Orchid Inbloom was named the inaugural winner of the Best Woman Owned SME at the Enterprise Centre’s SME Leadership Awards.



Maryelz Orchid Inbloom Limited Managing Director, Mary Saun, accepts the inaugural SME Leadership Award for Best Woman Owned SME from Bank of Papua New Guinea Assistant Governor – Corporate and Governance, Elizabeth Genia

This small private company was established in 2006 by Mary Elizabeth Saun and her husband Pius Giles Saun. With four staff it provides flower arrangements and pot plants to clients including the Grand Papua Hotel, the World Bank and the Institute of Business Studies.

The company also provides flower arrangement training to Papua New Guinea’s Cut Flower Association and private groups.



Maryelz Orchid Inbloom Managing Director, Mary Saun

All recipients of the Enterprise Centre’s 2017 SME Leadership Awards are listed in Table 1.

Table 1 – Enterprise Centre 2017 SME Leadership Award winners

Business	Award
Hahebou Construction Limited	Governance and Organisation
Nares Engineers Limited	Overall Top Performing SME and Business Management
Pearl Customs Agency	Financial Management
JBK Construction Limited	Human Resource Management
KJT Construction	Assets and Inventory Control
Mako Pest Control	Safety, Health and Environment
IM Associates Limited	Quality Control
Radho Piggery Limited	Reputation and Image
Ttanata Atwork Services Limited	Most Improved SME
Maryelz Orchid Inbloom Limited	Best Woman Owned SME



Students of Boera Primary School, in one of the LNG Plant site villages

4 Communities

EMPNG, works together with communities, non-government organisations and government agencies on programs that aim to build the capacity of local communities and community-based organisations.

4.1 Community investment

EMPNG's Community Development Support Management Plan and community investment programs aim to support economic empowerment and sustainable community development in Papua New Guinea.

The Plan encompasses education, health, women's economic opportunities, environmental and agricultural initiatives.

Activities are conducted in accordance with their relevant geographical areas, with local area programs conducted in communities near production facilities and national programs involving EMPNG's support for initiatives in Port Moresby and more broadly throughout Papua New Guinea.

EMPNG works together with relevant partner organisations to deliver social development programs.

During 2017, EMPNG spent PGK44.8 million (US\$13.9 million) on community investment programs involving education, health, community infrastructure and environmental projects.

4.1.1 Local area programs

Local area programs are intended to build sustainable capacity for communities surrounding production facilities.

During 2017, these programs supported the development of infrastructure and education initiatives in schools, as well as health care infrastructure for local communities.

Upstream area and pipeline Right of Way

Approximately 250 households involved in EMPNG's community livelihood improvement project produced almost 30 tonnes of fresh fruit and vegetables, which earned them more than PGK55,000 (US\$17,022) at market days during 2017.

The community livelihood improvement project was launched in August 2015 to educate and encourage community groups to improve the livelihoods and standards of living of their members and to generate household and group income from small enterprise development.



Plate 4.1 – Women from Hides planting crops as part of the community livelihood improvement project

To date, more than 500 women and almost 130 men have benefited from the project, which has encompassed: the production of planting materials and seeds; improved land management techniques; good crop management practices; poultry distribution; and improved food health and hygiene.

During 2017, EMPNG provided education and healthcare infrastructure in the Upstream area, including a fully refurbished health centre in Baguale Village, five refurbished classrooms at Juni Primary School and a new double classroom for Kikori Primary School.

The company also focused on providing potable water to Upstream area communities. This involved the donation of an 80,000-litre water tank to Pimaga Rural Hospital and a 300,000-litre water tank to Nipa Rural Hospital, in the Southern Highlands Province, to provide fresh drinking water for hospital patients.

Up Close: Men show support for community livelihood project

A group of Huli men has dressed in traditional costume to show support for EMPNG's community livelihood improvement project in the Upstream area.

The men are husbands of women from the Three Ways women's group, which is involved in agriculture and livelihood training through EMPNG.

They dressed in traditional attire in February to show their appreciation for the positive work that EMPNG was doing to transform their families and communities.

The men also wanted to show their partners and EMPNG they were committed to working together to support the community livelihood improvement project, which aims to promote the importance of food security for Upstream area communities.

There are currently 20 community groups participating in the project.



Huli men dress in traditional costume to show support for the community livelihood improvement project



Plate 4.2 – Women from the Three Ways women's group with harvested fruits and vegetables from their new garden with EMPNG Community Livelihood Improvement Project Officer, Shirley Tombenna during a market day

Another 22,000-litre water tank was provided to the Damayu and Fiwaga communities, which host the annual Kutubu Kundu and Digaso Festival. Waro Elementary School also received a water tank during the year in response to a request from the school for a clean water supply.

Another key health support initiative was the completion of refurbishment works at Baguale Health Centre. This included the installation of a new solar energy system for the Centre. Sport in schools is becoming a major strategy for improving retention rates of students. EMPNG has been working closely with local schools and the Papua New Guinea Olympic Committee on supporting initiatives to help address some of the social changes young people face.

For example, in February, EMPNG handed over a refurbished basketball court for students at Juni Primary School, while a newly constructed basketball court was provided to Para Primary School in August.



Plate 4.3 – HGCP Senior Field Superintendent, Ken Rhyason (second from left) and Head Teacher, Thomas Belo (second from right) officially open the Para Primary School basketball court

These basketball courts will help to support ongoing programs at the schools. EMPNG, in partnership with the Evangelical Church of Papua New Guinea, has also handed over a refurbished double classroom for Grade 5 and 6 students at Homa Paua Primary School in the Hela Province. In addition to the classroom, 40 new school desks were donated for the students.

EMPNG contributed PGK66,000 (US\$20,427) toward the seventh Kutubu Kundu and Digaso Festival held in September. The Festival is a community-driven initiative that promotes collaboration and sharing of traditional practices among 40 local communities from the Lake Kutubu region. Twenty-eight regional singing groups participated and more 4000 visitors, including scientists, conservationists, tourists and international cultural specialists attended.

EMPNG has supported the Festival since 2011 and provided total funding of more than PGK165,000 (US\$51,067). The 2017 theme was ‘My Song, My Dance, My Story, saving my home for tomorrow’.



Plate 4.4 – EMPNG Managing Director, Andrew Barry with Kutubu Kundu and Digaso Festival Deputy Chairman, Andrew Iгимabo (second from right) and members of the Festival Committee

More than 2000 people attended International Youth Day celebrations in Pimaga in the Southern Highlands Province on 7 October. The 2017 International Youth Day theme was ‘Youths for Peace’ and EMPNG contributed PGK38,870 (US\$12,030) to support activities on the day. During the celebrations, the Kuige Youth Training and Development Centre was officially opened.



Plate 4.5 - International Youth Day celebrations in Pimaga

The Centre provides technical training for youths in carpentry, electrical and mechanical skills. It also aims to provide access to distance education for Grades 7 to 10 under the Flexible Open and Distance Education Program.

EMPNG funded sewing machine care and maintenance training, as well as a train-the-trainer program for women’s groups along the pipeline ROW during 2017 so they could transfer their new skills to their communities. The two-week training program, costing more than PGK115,000 (US\$35,593), was conducted in September and was delivered by the Advancing PNG: Women Leaders Network Inc. in partnership with the Kutubu Women’s Association.

LNG Plant site

During 2017, EMPNG donated infrastructure to three LNG Plant site villages with the handover of the Lea Lea Community Centre, a new double classroom for Papa Preschool and a new Women’s Resource Centre in Boera.

Furniture, consisting of school desks, chairs and teacher's tables, was donated to nine schools in the LNG Plant site villages during the year. The furniture donations will improve the learning environment for students.

To support students during the dry season, EMPNG led a three-month water cartage initiative to deliver potable water to 12 schools in the LNG Plant site villages. The initiative began in September when the Operations team was able to redirect some of the LNG Plant site's potable water supply to the schools. A delivery roster was established with the schools to provide potable water on a regular basis. A total of 300,000 litres of water was delivered to schools including: Redscar High, Porebada Primary and Elementary, Maiari Preschool, Lea Lea Primary and Elementary, Bogi Literacy, Boera Primary and Elementary and Papa Primary, Elementary and Preschool.



Plate 4.6 – Papa Elementary School received a water donation from EMPNG during the 2017 dry season

As part of promoting science, technology, engineering and mathematics in target schools, science kits were donated to Papa, Lea Lea, Boera and Porebada primary schools in 2017. The science kits included microscopes, bell jars, filter papers, test tubes and magnets. These kits are making learning more fun by enabling science experiments to be conducted in the classroom.



Plate 4.7 – Lea Lea Primary School staff and students receive their science kit from EMPNG

EMPNG also donated medical supplies, such as syringes, urine bags and triangular bandages, to community clinics in Papa, Boera and Porebada villages to support patient care.

Players from the PNG Kumuls rugby league team conducted a coaching clinic in Boera Village during October, while PNG Hunters players conducted coaching clinics in the Central Province in February and Boera Village in October, with support from EMPNG. The clinics were provided to local rugby league associations and communities. During the coaching clinics, players delivered important messages to community members about reducing drug and alcohol abuse.



Plate 4.8 – PNG Kumuls players conduct a coaching clinic at Boera Village

EMPNG also assisted the Porebada Bulldogs, Boera Sailors, Papa Koita Cowboys and Lea Lea Buria Reds football teams with uniforms and sporting equipment to enable them to participate in regional tournaments during 2017.



Plate 4.9 – The Buria Reds rugby league team from Lea Lea Village receives sports equipment EMPNG donated

The Trukai Fun Run was supported for the third consecutive year with a donation of t-shirts to some 500 students from Papa, Lea Lea, Boera and Porebada primary schools and Redscar High School who participated in the run in June. Proceeds from EMPNG's purchase of the t-shirts supported the Papua New Guinea Sports Federation.

Twenty women from Boera Village attended the first Young Women's Christian Association (YWCA) forum during 2017.

The women had previously participated in the Rise Up program, supported by EMPNG in 2016.

Another 40 women from Lea Lea and Porebada villages participated in the 2017 Rise Up program. These programs aim to educate and empower young women to lead change in their society.



Plate 4.10 – Attendees of the first YWCA forum

EMPNG has supported the annual Hiri Moale Festival for the third consecutive year with a PGK50,000 (US\$15,475) donation. The Festival, held in September each year to celebrate the Motu Koitabuan cultures, also enables young Motu Koita girls to become cultural ambassadors for their villages.



Plate 4.11 – Hiri Moale Festival Chairman, Opao Fo'ó Udia and 2016 Miss Hiri Hanenamo Queen, Olive Tau, with EMPNG Managing Director, Andrew Barry, at the sponsorship acknowledgement ceremony

4.1.2 National programs

The Port Moresby Nature Park has opened a new learning centre to support its rapidly growing educational programs with schools. EMPNG provided funding for construction of the centre, which will deliver programs to more than 19,000 students each year.

The Nature Park also opened a new commercial kitchen to meet the growing demands of catering in the Park. The kitchen facility was a former camp office, which EMPNG donated.

Up Close: 'Making a Living' in LNG Plant site villages

EMPNG has donated planting equipment and seeds to support 'Making a Living' lessons at three primary schools in LNG Plant site villages.

The 'Making a Living' initiative is benefiting around 400 students in Grades 6, 7 and 8 attending Papa, Lea Lea and Boera primary schools.

The lessons aim to teach students how to be self-reliant in their communities by enabling the students to commercialise their produce on a small scale and earn an income.

The 'Making a Living' initiative showed early success during 2017 with Grade 8 students from Boera Primary School selling their first vegetable harvest and using the money for an end-of-year class celebration. The students successfully grew a nursery that resulted in a rich harvest of Chinese cabbages, corn and other vegetables.



Grade 8 student, Kevau Lohia, waters a Chinese cabbage plot at Boera Primary School

Since 2014, EMPNG has provided more than US\$1 million (PGK3.2 million) in funding to support the Park's educational and research activities.



Plate 4.12 – General Manager Port Moresby Nature Park, Michelle McGeorge; Red Sea Housing Chief Executive Officer, William Mills; EMPNG Executive Director – Production, Dinesh Sivasambo; and ECM Electrical representative, Phylistus Williams, open the Park’s new learning centre

EMPNG Managing Director, Andrew Barry, presented to over 600 participants at the PNG Women’s Forum held in Goroka in February. The theme for this year’s forum was ‘Strengthening our Voices Together’. The Forum provided a platform for discussions on the national election and economic empowerment for women. EMPNG has supported the Forum since its inception in 2014.



Plate 4.13 – PNG Women’s Forum participants

In March, EMPNG commemorated International Women’s Day with a series of panel discussions at the Port Moresby office, LNG Plant and HGCP organised by the Women in Energy Network.



Plate 4.14 – International Women’s Day panellists at the LNG Plant: Koisen Lawyers Principal, Avia Tupou; Kumul Petroleum Holdings Board Secretary, Norah Gau Lavett; EMPNG Measurement Engineer, Stephanie Maedel; former ANZ District Manager Southern Region, Ranu Seneka; and EMPNG Manager – National Content, Susil Nelson-Kongoi

An International Women’s Day breakfast organised by the Business Professional Women’s Association raised more than PGK150,000 (US\$46,425) to fund educational scholarships for 130 girls. EMPNG also contributed PGK82,500 (US\$25,500) toward the scholarship program.

In April, EMPNG Village Liaison Officer, James Tandupi, received the Community Leadership Award at the Papua New Guinea Men of Honour 2016 Awards for his exemplary leadership to help ensure peace in the Komo community.

The Men of Honour Awards recognise positive contributions of men in society. They cover five categories of education, leadership, ingenuity, sports and entrepreneurship.



Plate 4.15 – EMPNG Village Liaison Officer, James Tandupi receiving the Community Leadership Award at the Papua New Guinea Men of Honour 2016 Awards

EMPNG partnered with the Salvation Army to assist relief efforts with a donation of PGK20,000 (US\$6190) for families impacted by the Hanuabada fire in August. The donation was used to fund two 9000-litre water tanks and water carts to supply clean drinking water for the affected families. EMPNG also donated a shipping container to help with storage needs for impacted families. At least 150 villagers were left homeless after the fire engulfed 15 homes in Hanuabada Village near Port Moresby.



Plate 4.16 – Representatives from the LNG Plant, Salvation Army and the Hanuabada Fire Disaster Committee with the storage container donated for Hanuabada fire victims

In September, EMPNG joined Papua New Guinea’s 42nd Independence Day celebrations with a week of lunch-and-learn sessions focusing on Papua New Guinea’s growth and development.

During the week, EMPNG hosted Papua New Guinea's founding father, Grand Chief Sir Michael Somare, who spoke about the history of the country's independence. In Hides, workers continued their annual tradition of 'adopting an expat', where expatriate employees dressed in the traditional costumes of their Papua New Guinean sponsors and learned about their cultures. EMPNG also supported celebrations with the local community at Para Primary School.



Plate 4.17 – From front to back: Papua New Guinea's founding father, Grand Chief Sir Michael Somare, shares his country's history with EMPNG Managing Director, Andrew Barry and EMPNG Executive Director – External Affairs, Robert Aisi during Independence Day

In October, the Women in Energy Network commemorated Pinktober with activities focused on raising breast cancer awareness based on the theme, 'Rising Above Cancer'. Activities included a lunch-and-learn session at the HGCP, which involved a presentation about breast cancer, its causes, how it affects women and the support available.



Plate 4.18 – HGCP Women in Energy Network members celebrating Pinktober

EMPNG provided PGK20,000 (US\$6190) for the inaugural SME Corporation expo held in Port Moresby in November. More than 40 entrepreneurs showcased businesses ranging from catering and agriculture to fashion, retailing and events. The expo also provided an opportunity for business owners to network with each other.

To help build the capacity of communities, entrepreneurship training was delivered by the University of Sunshine Coast, Australia and agribusiness training was provided by the University of New England, Australia in 2017.

Forty community members participated in the training, with more than half of the participants being women.

EMPNG joined the Papua New Guinea Olympic Committee and local youth organisations in a Grassroot Soccer workshop held in November to organise soccer-based programs aimed at educating and inspiring at-risk youths to overcome health challenges.



Plate 4.19 – From left: Grassroot Soccer workshop attendee Hubert Warupi, Grassroot Soccer Global Partnership Director, Sarah Mills, Grassroot Soccer Training and Partnership Coordinator, Nicole Banister, EMPNG Community Development Support Manager Sisa Kini, YWCA Gender Trainer, Jacklyn Ravu and Papua New Guinea Olympic Committee General Manager, Andrew Lepani at the Grassroot Soccer workshop

The company continues to support Transparency International Papua New Guinea's anti-corruption initiatives with a PGK164,000 (US\$50,758) donation in 2017. The donation contributed to the Mike Manning Youth Democracy Camp and the school-based Civic Education Project.

The Mike Manning Youth Democracy Camp teaches high school students and out-of-school youths the basic principles of good governance and democracy. Forty-one participants, including 20 girls, attended the 2017 Camp, which was held in Port Moresby from July to September. During the Camp, participants attended 14 excursions, which included a visit to the National Parliament and National Library.

The Civic Education Project provides educational materials for school students about topics such as human rights, democracy, rule of law and advocacy.

EMPNG also provided a PGK82,000 (US\$25,379) donation to the YWCA for refurbishment of their national office in Port Moresby. EMPNG has supported the YWCA since 2015.

During 2017, EMPNG worked with the Papua New Guinea Tribal Foundation to reach some 10,000 people in six provinces with screenings of the film, *Senisim Pasin* or 'Change our Ways'. The film was developed to raise awareness about violent behaviour, with the aim of reducing violence in Papua New Guinea.

Education and training

EMPNG has signed a PGK30,000 (US\$9285) funding agreement with the Central Provincial Government to implement the School Board of Management training program in Central Province schools.

Up Close: GWIM alumni welcomes new recruits

Bala Kerapa from Kiunga in the Western Province and Julie Alo from Koroba District in the Hela Province have joined Papua New Guinea's Global Women in Management (GWIM) alumni after completing GWIM training in Washington DC during 2017.

The Centre for Development and Population Activities GWIM program, coordinated by Plan International USA, brings together women from diverse cultures to network, learn, share and adapt best practices from around the world for expanding women's economic opportunities.

For the first time, four past GWIM participants, Doreka Dai, Anna Hewago, Maureen Santana and Ruth Kissam, returned to Washington DC during 2017 for follow-up training to build their skills and capacity to design and facilitate similar programs in Papua New Guinea. They were among 13 GWIM alumni selected from almost 900 alumni worldwide to attend the training.

Sixty-four women from Papua New Guinea have benefited from the GWIM program since 2006. These women have become members of the Advancing PNG: Women Leaders Network Inc., which supports programs for women in Papua New Guinea. During 2017, EMPNG donated PGK500,000 (US\$154,750) to support the Network's activities.



GWIM participants Bala Kerapa (left) and Julie Alo (right) with EMPNG's Executive Director of External Affairs, Robert Aisi

The training program is based on the *School Board of Management Training Manual* developed by Esmie Sinapa Development Consultants, which was funded by EMPNG in partnership with the Central Provincial Government in 2016. It aims to improve board governance and leadership capabilities in schools.

The current EMPNG donation will enable the training to be delivered to school boards of management over the next two years and will include a train-the-trainer component, along with monitoring and evaluation of lessons learned from the Manual.

EMPNG is also helping to expand the School Board of Management training program to the Hela Province. In April, approximately 30 representatives from the Hela Provincial Government completed introductory training in Tari, with 10 schools in Komo, Angore and Hides trialling the training program in late 2017.

The second intake of 15 PNG LNG scholarship recipients began studies in 2017 to become community health workers in Papua New Guinea with support from EMPNG. The PNG LNG Scholarship program, funded by EMPNG in partnership with the Australian Government, is helping to address rural workforce gaps in health service delivery in Papua New Guinea. The first intake of seven scholarship recipients completed their studies during the year.



Plate 4.20 – EMPNG Community Development Support Manager, Sisa Kini (left), Facility Director, Australia Awards, Dr Kaye Eldridge (front right) and Education Counsellor, Australian High Commission, Suzanne Edgecombe (back right) with PNG LNG Scholarship recipients

EMPNG has donated PGK331,000 (US\$102,444) to The Voice Inc. to support the organisation's Centre for Leadership, which is providing leadership programs for students from the University of Goroka, Papua New Guinea University of Technology and University of Papua New Guinea.

In the past three years, EMPNG has contributed PGK774,000 (US\$239,553) to The Voice Inc. and has provided mentoring support for its leadership development programs.

Another PGK82,000 (US\$25,379) was provided to upgrade the University of Papua New Guinea's, School of Earth Science computer laboratory. Seventy geotechnical textbooks were also donated to the School.

EMPNG has donated PGK32,000 (US\$9904) to Life PNG Care's *Strongim Pikinini* or 'Strengthening Children' education program. The pilot program, which started in February, involves a mobile education unit that provides short-term education to vulnerable children on the streets and those living in marginalised communities. Almost 300 children have participated in the program.

During 2017, seven early childhood teachers completed literacy refresher training through the Buk bilong Komuniti Program with funding support from EMPNG.



Plate 4.21 – Students receiving education through Life PNG Care's *Strongim Pikinini* education program

The 12-month Program helped strengthen the teaching capacity of teachers from Maiari Preschool at Porebada and Papa Community Preschool.

EMPNG provided PGK232,000 (US\$71,804) to support the Kokoda Track Foundation and Central Provincial Government with delivering elementary qualification training to teachers in the Central Province during 2017. More than 110 volunteer teachers participated in the intensive six-week training program, which gave them the prerequisite qualifications to achieve paid positions as elementary teachers.

During 2017, EMPNG donated more than 2300 lap desks to students at elementary and primary schools in Moro, Hides, Kikori and LNG Plant site communities.

Lap desks are lightweight, portable writing surfaces that rest on a child's lap. The desks were provided to support learning and the development of writing skills for students in these communities.



Plate 4.22 – Porebada Elementary School students using their new lap desks

For the second consecutive year, EMPNG has been the major sponsor of Papua New Guinea's Olympic Values Education Program.

In 2017, EMPNG donated PGK231,700 (US\$71,711) to the Program, which integrates sporting values and physical activity into a cultural and educational framework to help promote the three Olympic values of respect, friendship and excellence.



Plate 4.23 – Porebada Elementary School students thank EMPNG for their lap desk donation



Plate 4.24 – Karate athlete, Nigel Bana, delivers an Olympic Values Education Program lesson at Malaguna Technical Secondary School in Kokopo in East New Britain

Up Close: Young PNG leader gets United Nations attention

Lydia Dimokari is joining worldwide youth leaders in the seventh annual Economic and Social Council Youth Forum at the United Nations headquarters, New York in January 2018 to share her work with Mission Vibe in Papua New Guinea.

Lydia was part of the Leadership Development Program with The Voice Inc. at the University of Papua New Guinea. While doing the Program in 2015, Lydia started Mission Vibe to share what she had learned with other young people who were not at work or school. She hosted educational sessions from the backyard of her house and the house of a friend who was also part of the Leadership Development Program. During these sessions she would provide refreshments and take young people through topics such as the importance of goal setting, finding purpose in life and knowing your worth and value.

Mission Vibe sessions have since been conducted at numerous primary and high schools in Papua New Guinea and Lydia is seen as a role model in her community for her work with young people.



Mission Vibe founder, Lydia Dimokari

During 2017, the Program reached almost 15,000 students in the Western Highlands, Southern Highlands, Central, Milne Bay, Hela, West New Britain and East New Britain provinces.

Science Ambassador Program

More than 1000 students from 16 schools participated in the ExxonMobil Science Ambassador Program during 2017. The Program uses an interactive approach to encourage students to consider careers in science, technology, engineering and mathematics. It involves practical experiments and lessons on topics such as rocks and geology and the origins of oil and gas.



Plate 4.25 – EMPNG Facilities Surveillance Engineer, Christine Sahuburua, explains the different types of rocks to Boera Primary School students

In 2017, participating schools were: Redscar High School; Porebada, Boera, Papa and Lea Lea primary schools, near the LNG Plant site; and Para, Juni, Tukupawi, Edauwi, Komo Seventh Day Adventist, Mananda and St. Paul's Komo Catholic primary schools, near the HGCP.

The Science Ambassador Program was introduced to Papua New Guinea in 2013 and more than 3700 students from 36 schools have participated to date.

Community health

EMPNG continued its partnership with the Texas Children's Hospital during 2017, with a focus on maternal and child health, improving healthcare education and strengthening the public health program in Papua New Guinea.

During the year, Texas Children's Hospital doctors supported the development of a monitoring and evaluation framework for the National Department of Health human papillomavirus vaccination program for children aged between nine and 13 years in the National Capital District. The doctors also supported the development of tuberculosis education materials for children.

As part of the Texas Children's Hospital partnership with EMPNG, the doctors delivered lectures to more than 250 University of Papua New Guinea paediatric and public health care postgraduate students during 2017. Another 582 hours of lectures were delivered to 1370 undergraduate students in the University's Paediatric and Public Health Care program. Seventy-six students were mentored for reports and projects.

The doctors also continued to provide mentoring to 36 health professionals at the Port Moresby General Hospital. During 2017, the doctors treated almost 2000 paediatric acute malnutrition patients.

EMPNG contributed PGK165,000 (US\$51,067) towards the 2017 Papua New Guinea Cancer Foundation's Healthy Teens School Program.



Plate 4.26 – The Papua New Guinea Cancer Foundation's Healthy Teens School Program is encouraging teenagers to make healthy lifestyle choices

The Program targets primary school students from Grades 6 to 8 and aims to encourage teenagers to make healthy lifestyle choices as a way to reduce their risk of developing cancer. Participating schools include Papa, Lea Lea, Hanuabada, Baruni, Boera, Tatana, Porebada and Port Moresby primary and elementary schools. The Healthy Teens School Program reached more than 500 students in 2017.

Since 2014, EMPNG has provided PGK269,700 (US\$83,472) for the Papua New Guinea Cancer Foundation's programs. EMPNG also provided PGK82,500 (US\$25,500) to the annual Medical Society of Papua New Guinea symposium during 2017.

The symposium involved more than 1000 medical professionals from Papua New Guinea and overseas.

Volunteers

More than 1800 volunteer hours were recorded with 404 EMPNG employees engaged in 13 volunteer activities during 2017. Supporting literacy in Papua New Guinea was a key volunteer activity, with more than 40 EMPNG employees delivering and reading books to school students for National Book Week and National Literacy Week in August.

In partnership with Buk bilong Pikinini children's libraries, EMPNG volunteers also sorted and packed more than 9400 books for donation to schools in Kikori, Hides, Moro and the LNG Plant site villages.

Twenty-five EMPNG volunteers brought Christmas cheer when they dressed as Santa Claus and delivered presents to children at the Friends Foundation Centre at Port Moresby General Hospital and the Children's Ward at the 6-Mile Clinic in December. More than 200 Christmas gifts were donated.



Plate 4.27 – Manager – LNG, Jagir Baxi (centre), Karen Baxi (left) and EMPNG Community Affairs Officer, Christine Yango read to Boera Elementary School students



Plate 4.28 – Lynda Babao-O'Neill, wife of the Prime Minister, participates in National Literacy Week activities at the University of Papua New Guinea



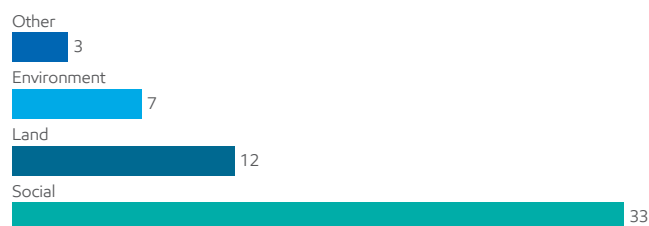
Plate 4.29 – EMPNG volunteers Shannen Sok-Mun Pun, Anna Kan and Karen Godua sort books for donation to schools in Kikori, Hides, Moro and the LNG Plant site villages

4.2 Community grievance management

Fifty-five grievances were registered and categorised during 2017, compared to 36 recorded in 2016. The increase in grievances was due to the start of construction activities for the Angore Gathering System. The number of grievances registered in 2017 is shown by category in Figure 4.1.

Grievances

Figure 4.1 – Number of active grievances by category for 2017



Thirty-three of the grievances registered in 2017 related to social concerns. Twenty-eight of these regarded compensation claims for minor impacts to crops and thatched roofing from helicopter down drafts during haulage operations along the Angore pipeline ROW. Seventeen of the Angore-related grievances were closed and compensation paid to impacted landowners. Eleven remained open due to security restrictions in the Upstream area during 2017. These will be addressed and closed as soon as EMPNG field teams are able to enter the region.

Land grievances, mainly related to compensation claims, accounted for twelve of the grievances received during 2017.

Seven environmental grievances were recorded during 2017. Two of these regarded heavy rain causing water to overflow and impact gardens, while another regarded an overflow of water from a holding tank because of vandalism to valves on the tank. Compensation was paid to the first two claimants but not to the claim that involved vandalism to the water tank. One claim from a community located behind the Port Moresby office related to an impact of debris from heavy rain that caused water to cascade out of a remodelled creek outlet. This was managed with the employment of local workers to conduct reinstatement works.

Other grievances received during 2017 included two compensation claims about vehicles injuring a dog and a domesticated pig.

By the end of December, most grievances registered were addressed and closed, except for 11 concerning Angore Gathering System works, which were carried over to 2018.

4.3 Resettlement

Wherever possible, EMPNG aims to avoid resettlement resulting from construction activities. In situations where resettlement is unavoidable, the company aims to improve, or at least restore, the standard of living and livelihoods of displaced persons.

During pre-construction surveys, seven households were identified as being economically displaced by land acquisition for the Angore Gathering System, with one of these households being physically displaced. EMPNG began the resettlement process for these households in 2016 with compensation completed by early 2017.

After engineers identified a potential landslip risk outside the operational areas of the Angore Gathering System, EMPNG led a community safety initiative to inform the owners of speculative structures in the vicinity about the risk. As a result, numerous speculative structures were removed.

4.4 Compensation

During 2017, seven Clan Agency Agreements were signed and compensation was paid to landowning clans for access to Pangoyana Quarry, located between Tubage Junction and Homa, as well as an area covering 6 kilometres of land between Maruba River to Dajia River, Homa and Kebute Mountain to Juli Hill.

At the end of the year, 258 annual deprivation payments were completed using the electronic payment method, with seven remaining outstanding due to internal clan disputes. These funds will be paid once the clan disputes are resolved.



Operations Technician trainees, Naomi Iowa and Jacqueline Kuambu from intake four of the Operations and Maintenance training program assemble a valve during training at the Kumul Petroleum Academy

5 Workforce

EMPNG offers ongoing training and accreditation opportunities to develop the skills and technical capacity of Papua New Guinean production workers.

5.1 Workforce composition

By the end of 2017, 2580 employees and contractors were working in production-related roles with EMPNG. Over 2100 of these were Papua New Guinean citizens, who comprised 82 percent of the workforce.

Third party contractors represent 70 percent of the production workforce. Nearly 90 percent of contractor workers are Papua New Guinean.

Thirty-nine percent of the EMPNG workforce is based in the Upstream area, with another 36 percent based at the LNG Plant site. The remainder of the workforce is based in other locations, such as the Port Moresby office.

Employment of workers from areas surrounding EMPNG facilities is a priority for the company. Of the total Papua New Guinean workforce, 40 percent are employed at worksites in their local area.

Another 31 percent are employed from the broader regional areas in which the company operates. Other Papua New Guinean workers are employed from elsewhere in the country.

5.2 Workforce training

In-house training and externally delivered courses are provided to develop the skills of EMPNG workers and contractors. Specific training is provided for the EMPNG workforce, while contractors deliver training that is relevant to their scopes of work.

In 2017, the equivalent of 80,200 hours of training were delivered through 2154 courses to some 7890 employee and contractor training participants.

More than 90 percent of all training hours were delivered to Papua New Guinean citizens.

Contractors achieved a milestone with the equivalent of 100,000 hours of training delivered since the start of production.

5.2.1 EMPNG workforce training

The equivalent of 42,860 hours of training were provided to 1998 EMPNG workforce course participants across 1799 different courses in 2017. This compares to 65,500 hours of training delivered to almost 2200 participants during 2016. The decline in training hours, compared to 2016, is due to the third intake of Operations and Maintenance training program trainees completing their courses and moving to on-the-job training. Since the start of production, the equivalent of 174,840 hours of training has been delivered to over 7200 course participants.

Training continues to focus on building the production workforce's technical skills.

Other non-technical courses delivered in 2017 included:

- Cyber security awareness – This course increases awareness on cyber-attacks, enabling participants to identify phishing and suspicious emails so they can protect company assets
- Data privacy – This training covers EMPNG's data privacy policies and guidelines so employees are aware of their responsibilities regarding the protection of personal information in the workplace
- Records management guidelines – Employees are reminded to follow the company's records management guidelines when managing files and records of transactions and other company information.

Approximately 64 percent of training participants during 2017 were Papua New Guinean citizens. Of these, 36 percent were women.

Cultural awareness training is delivered to all workers, with 29 sessions provided to 76 participants during 2017 through site inductions and supervisor training.

Engineering and technical professionals

Eight engineers were appointed to full-time roles within EMPNG during 2017 as discussed in *Case study: Technical professionals settle into new jobs*. This included Lei Banduru, who joined the company as an Electrical Engineer and Nathaniel Tuba who was appointed as a Surveillance Engineer, while Samuel Maihua was employed as a Machinery Engineer.

Henry Wala was employed as a Project Engineer during the year, while Jacky Elaia was appointed as a Civil Engineer and David Homoka as an Instrumentation and Controls Engineer. Both Jermaine Terence and Sebastian Hemetsberger joined EMPNG as Integrity Engineers.

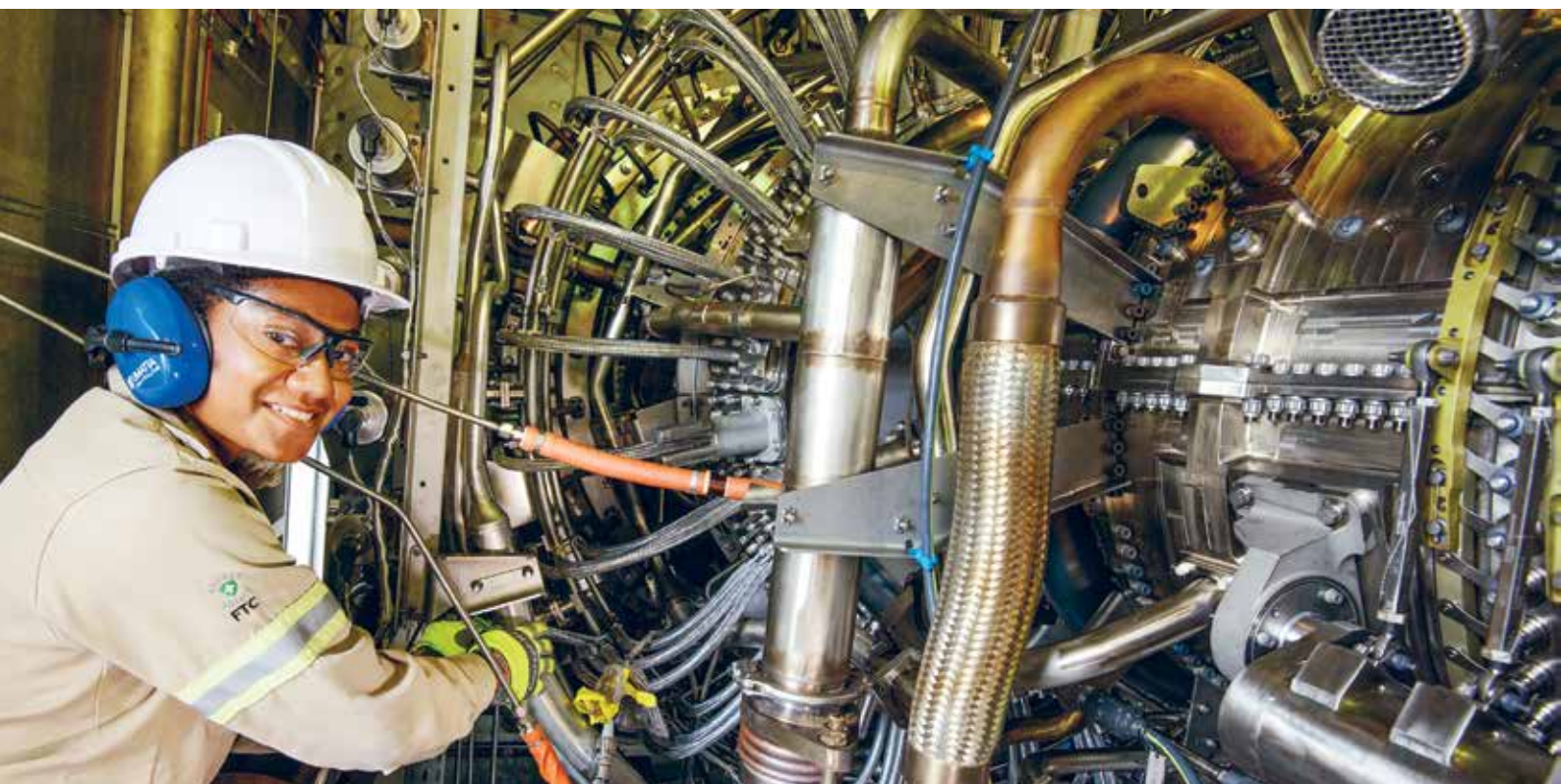


Plate 5.1 – Mechanical Technician, Michelle Samai working on one of the 10 LNG Plant 30-megawatt refrigeration gas turbines, which help cool and liquefy natural gas

EMPNG also appointed four technical professionals, including Joe Appa, who was employed as a Safety Specialist, along with Nicole Yasi and Niwel Abel who joined the Environment and Regulatory team as Environment Advisor and Regulatory Advisor, respectively. Lynn Kari was appointed as a Programmatics Technician to support EMPNG's Engineering team.

Recruitment activities for university engineering graduates increased during 2017 with visits by EMPNG's Engineering team to numerous tertiary campuses. Toward the end of the year, seven Papua New Guinean engineering students participated in work experience with EMPNG's Engineering team during their summer break.

Operations and maintenance

The fourth intake of 16 trainees began the Operations and Maintenance training program at the Kumul Petroleum Academy in January and completed junior technician requirements in December. They will begin work at EMPNG facilities in January 2018, with nine working in operations, three in instrumentation, three in mechanical and one as an electrical technician.



Plate 5.2 – Members of the fourth intake of Operations and Maintenance trainees

This is the first intake of trainees to be sponsored by EMPNG to complete their training through the Kumul Petroleum Academy. Previous Operations and Maintenance training program intakes were trained in Canada, Malaysia and Australia. The fifth intake of Operations and Maintenance trainees will begin their training in 2018.

Technicians from the first two intakes of the Operations and Maintenance training program are now becoming leaders in their respective fields. During 2017, 47 of these technicians achieved Technician Level 2 qualifications. The requirements for Technician Level 2 include the achievement of Technician Level 1 as well as competency in utilities and process. For maintenance technicians, they must achieve competency in complex maintenance skills.

All 39 trainees from the third intake of the Operations and Maintenance training program achieved Technician Level 1 during the year.

To achieve Technician Level 1 the trainees had to demonstrate a high quality of work, initiative and the ability to self-monitor.

They also had to show teamwork and competency at the worksite, strong planning and organisational skills and high levels of safety, health and environmental awareness.

In April, Noah Pingin from the first intake of Operations and Maintenance trainees was appointed as a Control Room Technician at the HGCP, while Vickie Watch from the second intake achieved her Control Room Technician appointment in December.



Plate 5.3 – Control Room Technicians, Noah Pingin (left) and Vickie Watch (right) with Alex Oki, who is completing training to become a Control Room Technician

At the LNG Plant, Dairy Pota from the second intake of trainees and Esther Kila and Lamech Alu from the first intake, were appointed as Utilities, Storage and Loading Control Room Technicians during 2017.



Plate 5.4 – Utilities, Storage and Loading Control Room Technician, Dairy Pota, working in the LNG Plant control room

Nineteen electrical technicians from the first two Operations and Maintenance training program intakes progressed their electrical license requirements, with the first expected to graduate in early 2018.

Technicians from the first three intakes of the Operations and Maintenance training program have developed an excellent working culture, with senior technicians mentoring junior technicians.



Electrical Engineer, Lei Banduru working on a switchgear protection relay at an LNG Plant substation

Case study

Technical professionals settle into new jobs

EMPNG's newest technical professional recruits have settled into their roles and are enjoying contributing to LNG production in Papua New Guinea.

EMPNG employed Sebastian Hemetsberger in 2015 during his third year of university studies. During this time, Sebastian was involved in the early stages of building equipment strategies for pressure safety valves and now owns the program.



"The people I work with in EMPNG are well versed in their field and are always available to help. It's amazing that even managers come down to our level to find out what we are working on and how we are doing. The concept of safety has always been one that was emphasised time and again and it is truly an amazing feeling working for a company that cares for everyone's safety."

Sebastian Hemetsberger
Integrity Engineer
EMPNG

Sebastian is responsible for ensuring the integrity of all piping within EMPNG, both at Hides and the LNG Plant, and making sure all testing is being conducted, particularly for pressure safety valves, which are a pressurised vessel's last line of defence.

Sebastian says what he likes most about being part of EMPNG are the training programs offered to employees because they challenge him to do well and be good at what he does.



Integrity Engineer, Sebastian Hemetsberger at his office

EMPNG Regulatory Advisor, Niwel Abel is the only one of his eight siblings to have made it through university and into formal employment. Niwel graduated from the Papua New Guinea University of Technology with a degree in Commercial Computing and specialised in database programming after completing his studies.

Case study

Technical professionals settle into new jobs

Niwel initially thought his career revolved around computer programming, but once he became involved in compliance, his interests changed and now he is charting a compliance career into the future.

Niwel's job involves working with government departments on regulatory matters associated with the ongoing operations of PNG LNG and discussing these matters with key subject matter experts, supervisors and managers within EMPNG. The primary objective of Niwel's role is to keep EMPNG operations within compliance parameters and applicable national laws and international standards.



"The challenge to keep our operations in compliance is diverse and broad in itself. From the exploration, drilling, engineering, marine, aviation, facilities, logistics, environment and operations aspects of the business, I'd say I am privileged to have learned a lot, and ensuring those functions operate within regulatory boundaries is rewarding. It has truly enriched me personally and professionally."

Niwel Abel
Regulatory Advisor
EMPNG



EMPNG Regulatory Advisor, Niwel Abel (second from right) with the Department of Petroleum and Energy: Director of Petroleum, Bob Sari (left); Secretary, Kepsy Puiye (second from left); and Assistant Director – Engineering Branch, Warea Undi (right) during a visit to the HGCP and Hides Wellpads to inspect ultrasonic metering technology

As an Electrical Engineer, Lei Banduru is required to support production at the LNG Plant, ensuring that power and export power systems are stable and reliable.

This means, as part of the Electrical team, Lei makes sure the LNG Plant lights come on at night and the pumps and compressors spin all day, every day.

The Electrical team is also responsible for ensuring Port Moresby receives the power it needs to help operate the city.



"I enjoy the work we do. Some days we analyse and troubleshoot electrical faults, other days we are working on implementing changes to the electrical system and equipment. It is a realisation day-in and day-out that this is what I want to do."

Lei Banduru
Electrical Engineer
EMPNG

Environmental Advisor Nicole Yasi, from the Southern Highlands Province, coordinates teams to conduct environmental monitoring in the field. She also writes reports regarding monitoring results for EMPNG.



"My role is to provide guidance and support to our operations and maintenance teams for any environmental concerns that they may need help addressing and resolving; and of course, ensuring all Environmental Permit requirements are met. I like that my role requires me to work with different teams. Part of our troubleshooting is understanding what's causing the issue, and through that I learn a lot about other fields as well."

Nicole Yasi
Environmental Advisor
EMPNG



Environmental Advisor, Nicole Yasi sampling groundwater wells



Plate 5.5 – Level 2 Operations Technician, Eunice Isaac, assisting Level 1 Operations Technician, Ramona Terence, with taking an amine sample

5.2.2 Contractor training

Contractors have reached a milestone with the equivalent of 100,000 hours of training delivered since the start of production. Of this, the equivalent of 37,350 hours of training were delivered in 2017.

Training during the year was provided to 5895 Papua New Guinean course participants through some 355 different courses. Women comprised 17 percent of all Papua New Guinean contractors trained.

Fifty-seven percent of contractors were trained in the Upstream area, with 28 percent trained at the LNG Plant.

Of the contractor workforce trained during 2017, 45 percent were employed from local communities, 33 percent from the broader region surrounding their worksite and the remaining 22 percent from elsewhere within Papua New Guinea.

Training topics included permit holder training, performing lifting operations, working at heights, live services training and loss prevention system training.

5.3 Workforce health

EMPNG continues to deliver high standards of medical, public health and industrial hygiene programs and services to support operations at all worksites.

Medical

During 2017, EMPNG upgraded emergency equipment in camp clinics and appointed a new Papua New Guinean doctor to the HGCP clinic as discussed in *Case study: Investing in patient care*.

EMPNG clinicians conducted more than 6000 patient consultations at camp clinics in the Upstream area and some 5500 patient consultations at the LNG Plant site clinic during the year. This is consistent with the number of consultations conducted during 2016. Most clinic visits were for general medical reviews, tuberculosis screening, malaria prevention, pre-employment medical screening and vaccinations. Almost 2700 workers received tuberculosis screening in 2017. Six active tuberculosis cases were identified and managed, with no transmission of the illness in the workplace. Another 782 latent tuberculosis cases were identified and registered in the tuberculosis surveillance program.

Audiometry testing was also completed for 215 EMPNG workers as part of the Hearing Conservation Program for staff who work in areas with potential noise hazards.

Workforce vaccination requirements were revised during 2017 to only include specific roles, such as food handlers and emergency responders. Free influenza vaccinations were provided for all workers during the year.

In November, all clinic laboratory technicians completed a five-day World Health Organisation accredited course on microscopy malaria slide reading. The course was delivered in Port Moresby.

The clinical service provider continues to deliver health awareness toolbox talks to EMPNG workers and contractors on topics such as healthy living, women's health, foodborne illnesses, snakebite treatment, infectious disease control and sexually transmitted infections. More than 1200 toolbox talks covering 56 health topics were delivered during 2017.

Fourteen emergency medical evacuations were conducted during the year. None of these were work-related.

Public health

EMPNG and its contractors are maintaining high health standards in camps across hygiene and sanitation, food and potable water safety, vector surveillance and control and infectious disease management.

During 2017, an updated Food Safety Program was implemented at all worksites.

No infectious disease outbreak was recorded at any EMPNG facility in 2017. Infectious disease outbreak management training and emergency response drills were conducted at Upstream area and LNG Plant worksites.



Plate 5.6 – Kitchen Hand, Cathy Mek, and Senior Cook, Henry Lape, maintain high food safety standards in the HGCP Camp kitchen

Thirty-two health inspections were undertaken during the year to assess the effectiveness of clinical and public health programs. All programs met EMPNG's assessment criteria.

EMPNG continues to maintain the 'Partnership in Health' agreement with the Papua New Guinea Institute of Medical Research.

A key component of the agreement is the integrated Health Demographic Surveillance System (iHDSS), which has been used to monitor the impact of PNG LNG on the health of communities within Hiri and Hides between 2007 and 2017.

A review of the iHDSS was completed during 2017 with support from EMPNG. While the review found no significant change in underlying morbidity patterns as a result of PNG LNG, it concluded that the iHDSS had provided comprehensive health data regarding illness and death patterns in Papua New Guinea that can be used by the National Department of Health to identify and target specific intervention programs to improve health outcomes in the country.

It also found that educational attainment, particularly for women, improved in Hiri, while some positive economic consumption changes, such as the use of bank accounts and purchase of improved housing materials, were recorded in both Hiri and Hides.

The 'Partnership in Health' agreement has resulted in the development of the National Infectious Disease Diagnostic Research Laboratory, which includes state of the art facilities to help improve diagnostic research and training capabilities in Papua New Guinea.

Industrial hygiene

EMPNG employees and contractors continue to participate in hazardous materials training to ensure the safe management of hazardous substances at all worksites.

Eighty-three industrial hygiene inspections were conducted during 2017 to assess respiratory protection, benzene control, chemical storage and noise management in the workplace. Noise monitoring was conducted at Komo Airfield terminal to confirm that noise exposure from operating aircraft had reduced for workers and passengers since the installation of a sonic noise curtain. Monitoring confirmed that noise was within ExxonMobil occupational exposure levels.

Support was provided during a shutdown of the LNG Plant for maintenance activities through a review of work procedures, an assessment of potential health hazards and recommendations for protective equipment for workers. Non-routine maintenance activities were also supported at the HGCP and Hides Wellpads through a review of work procedures for pipeline pigging and carbon filter change-out activities, to ensure workers were equipped with the correct protective equipment for these tasks.

An industrial hygiene technician attended radiation safety training in Australia during 2017 to gain the skills required to conduct radiation program assessments for unsealed and sealed radiation sources, as well as implement controls for workplace radiation safety.

Other strategic initiatives

Following an increase in conjunctivitis cases at the LNG Plant during April and May, EMPNG identified that most cases were originating from two of the LNG Plant site villages.

Up Close: Industrial Hygiene Technician supports regional initiatives

EMPNG Industrial Hygiene Technician, Mary Popot, is helping Exxon Mobil Corporation's Industrial Hygiene team to improve their learning and development plans across Asia Pacific.

Mary is part of EMPNG's Medicine and Occupational Health team, which conducts health inspections and health risk assessments at all worksites to identify, evaluate and provide recommendations to manage risks that have a potential impact to worker health.

In November, she facilitated a workshop at the Asia Pacific Industrial Hygiene Centre of Excellence conference in Chiang Mai, Thailand for 15 ExxonMobil industrial hygienists, coordinators and managers from seven countries.

Mary, who graduated from the Papua New Guinea University of Technology prior to her role with EMPNG, said she enjoyed working with industrial hygienists from other regions and sharing her knowledge about EMPNG's industrial hygiene programs.



"It is great being able to share my experience from EMPNG with other industrial hygiene professionals and to learn about how they apply industrial hygiene programs on their projects."

Mary Popot
Industrial Hygiene Technician
EMPNG



EMPNG Industrial Hygiene Technician, Mary Popot, presenting at the Asia Pacific Industrial Hygiene Centre of Excellence conference

In addition to managing cases at worksites, EMPNG donated medication and hand sanitisers to clinics in these villages to reduce cases in the community.

To encourage conversations about mental health awareness and remove some of the stigma associated with mental illness, EMPNG observed Mental Health Week in October. The company's Mental Health Week theme was *Wantok bilong lukautim tingting*, which translates to 'A friend who takes care of mental health'.



International SOS Clinical Educator, Ron Veitch, teaches LNG Plant Nursing Officer, Helen Ipauki, about the operation of SimMan®

Case study

Investing in patient care

EMPNG has upgraded emergency response equipment and invested in additional training for clinicians to maintain high standards of patient care in Hides, Moro and LNG Plant clinics.

During 2017, EMPNG purchased six new portable multi-purpose defibrillators and monitors that are based on a platform developed for the military and air medical operations. The defibrillators, which have been distributed among the Hides, Moro and LNG Plant clinics, will help to improve emergency medical care.

EMPNG has also invested in an upgraded SimMan® patient simulator specifically designed for medical training.

SimMan® is a realistic, full-body adult wireless patient simulator mannequin used to teach the core skills of airway, breathing, cardiac and circulation management.

The SimMan® mannequin is being used in the LNG Plant, Moro and HGCP clinics to simulate a patient's response in emergency scenarios such as motor vehicle accidents. It enables clinicians to maintain high levels of competency with performing invasive life-saving procedures such as inserting a chest drain, inserting an intravenous catheter and endotracheal intubation.

EMPNG continues to use QuantiFERON® testing, which is helping to rapidly identify worker exposure to tuberculosis within 48 hours of a sample being taken. This enables the company to quickly identify and manage tuberculosis, with no transmission of the illness in the workplace since 2011.



Laboratory Manager, Martin Kirara, prepares blood samples for QuantiFERON® testing at the LNG Plant as part of tuberculosis screening

Two FILMARRAY® systems continue to be used at the LNG Plant and HGCP clinics.

The FILMARRAY® system includes respiratory, blood culture, gastrointestinal and meningitis/encephalitis panels that enable clinicians to sample, detect and analyse pathogens within an hour.

Case study

Investing in patient care

This provides them with the ability to rapidly identify and manage infectious illnesses at worksites. Since the systems were introduced in 2013, there has been a steady decline in infectious illnesses, and in 2017 there were no infectious illness outbreaks at any EMPNG worksite.

The clinical educator is providing ongoing training to clinicians in topics including cardiac, respiratory, renal and gastrointestinal emergencies, the management of shock, burns and trauma and infectious disease control.

EMPNG training is also supported by the Australian Army Malaria Institute, which is conducting quality assurance for blood slides in malaria diagnosis to determine the performance of EMPNG laboratory technicians. This helps to support the technicians' studies in a World Health Organisation External Competency Assessment Malaria Microscopy course. Four EMPNG technicians have completed this course to date.

A new electronic global medical records management system introduced at the end of 2016 is enabling clinicians to more efficiently share and manage worker medical records across all worksites. It is also enabling clinicians to more effectively track the completion of tuberculosis screening for staff.



Laboratory Technician, Rana Nema, conducts an analysis at the HGCP clinic

Up Close:

New doctor for Hides

In July, Dr Julius Plinduo was appointed to support EMPNG's clinical operations in Hides, replacing an expatriate physician.

Dr Plinduo, from Tuonumbu Village in the Yangoru District of East Sepik Province, has more than six years of experience as an emergency physician in numerous government and private health facilities, including the Kiunga District Hospital in the Western Province. He also holds a Diploma in Anaesthesia and Master's in Emergency Medicine from the University of Papua New Guinea.



Dr Julius Plinduo attending to Nick Ngule who works as a guard with Hides Security Services

Dr Plinduo brings to Hides his emergency and infectious disease management experience in rural Papua New Guinean communities.



"I am delighted to be given this opportunity to be an ambassador for my family, my people and my colleagues, especially the emergency medicine fraternity of Papua New Guinea.

I am happy to be part of a well-resourced setting in an ExxonMobil clinic, where best practice of international health standards is being adhered to.

Using my skills, knowledge and experience in a remote site at the HGCP clinic, while conforming to best practices, is exciting.

Treating and working among a multi-cultural team has also been a very pleasant experience."

Dr Julius Plinduo
Emergency Physician and Site Doctor
HGCP clinic

Counsellors supported worksite activities and Odd Socks Day was observed at the Port Moresby office where workers wore mis-matched coloured socks to promote discussions about mental illness. Workers were encouraged to take a moment to check on their colleagues with a short 'Yu OK?' or 'Are you OK?'

To commemorate 2017 World Tuberculosis Day, EMPNG distributed 600 medical screening vouchers for families of EMPNG workers, and Port Moresby General Hospital tuberculosis specialist, Dr Randi Moke, provided a tuberculosis education session at the Port Moresby office. EMPNG also partnered with local health clinics in Para, Benaria and Kikori to support tuberculosis education in communities.



Plate 5.7 – Dr Randi Moke, Port Moresby General Hospital tuberculosis specialist, conducting a tuberculosis education session at the Port Moresby office

EMPNG workers donated 126 bags of blood to the Port Moresby General Hospital Blood Bank during 2017. The donation was the result of a campaign organised by EMPNG to support the Blood Bank, which provides much needed supplies to hospitals throughout Papua New Guinea.

On 25 April, lunch-and-learn sessions were held to recognise World Malaria Day. Members of the PNG Hunters rugby league team helped distribute mosquito bed nets and mosquito repellent to EMPNG workers.



Plate 5.8 – PNG Hunters rugby league team members distribute mosquito bed nets to EMPNG workers at the Port Moresby office

All EMPNG sites observed World Acquired Immune Deficiency Syndrome (AIDS) Day on 1 December with events including a lunch-and-learn session about AIDS prevention at the Port Moresby office.

5.4 Workforce safety

The LNG Plant achieved a milestone of more than 10 million hours worked without a Lost Time Incident since the start of production. The LNG Plant also completed two significant maintenance campaigns for the refrigeration gas turbines with more than 75,000 hours worked without a recordable injury. Upstream area teams achieved 263 consecutive days without a recordable injury.

For the fourth consecutive year, EMPNG's Supply Chain and Warehousing team was awarded ExxonMobil's Procurement Global Supply Chain Gold Star Award for outstanding safety performance and operations.



Plate 5.9 – LNG Plant Safety Specialist, Joe Appa (right) congratulates Warehouse Operator, Morea Lohia on receiving ExxonMobil's Procurement Global Supply Chain Gold Star Award for 2017

Core safety processes

EMPNG's core safety programs are defined by ExxonMobil's Operations Integrity Management System, which uses a set of indicators to determine the health of safety systems. Leading indicators measure the effectiveness of EMPNG's safety programs, while lagging indicators measure actual incidents, consequences and overall safety performance.

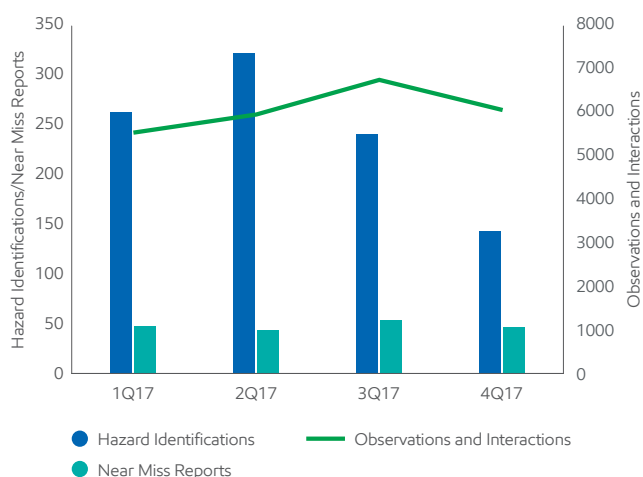
Key leading safety indicators include Observations and Interactions, Hazard Identifications and Near Miss Reports.

During 2017, 79 percent of workers submitted Observations and Interactions each month, with more than 24,000 Observations and Interactions recorded for the year as shown in Figure 5.1. The focus remains on improving the quality of peer-to-peer observations and discussions rather than the quantity of reports submitted.

Levels of Hazard Identifications and Near Miss Reports remained consistent with the previous year, with more than 800 Hazard Identifications and 160 Near Miss Reports submitted in 2017. The steady use of these programs is due to continued worker awareness and discussions about these processes in monthly safety meetings and toolbox talks.

Core safety processes

Figure 5.1 – Number reported by quarter



Key lagging safety indicators for EMPNG include Lost Time Injury Rate, Total Recordable Incident Rate and the number of Tier 1 and Tier 2 process safety events as defined by IPIECA, the global oil and gas industry association.

In July, EMPNG recorded its first Lost Time Injury since production began when a worker assaulted and injured a co-worker. Prior to this, EMPNG had maintained zero Lost Time Injuries for 1428 consecutive days. This resulted in a 2017 Lost Time Injury Rate of 0.02 compared to the 2016 rate of 0.00.

At the end of 2017, EMPNG had a Total Recordable Incident Rate of 0.28, which was an increase from 0.13 in 2016. This was primarily due to an increase of workers being injured in security incidents. EMPNG has improved security systems and programs to reduce the risk to workers.

No significant process safety events were recorded for EMPNG for the third consecutive year.

Activities conducted to maintain and improve safety in the workplace during 2017 included:

- ‘Safe Start’ campaign – In 2017 this campaign included nine presentation and discussion sessions by senior management who reinforced to employees and contractors that safety is a core value in EMPNG. Each session reviewed EMPNG’s 2016 safety results and emphasised the company’s 2017 safety focus themes: Take Responsibility and Actively Care; Manage Major Risks and Barriers; and Learn from Incidents. The sessions also outlined what was expected from managers, supervisors and workers to maintain the company’s vision of ‘*Nobody Gets Hurt*’
- Leadership in the field – EMPNG increased its focus on first and second line supervisors being actively engaged with pre-job planning and field execution to ensure workers adequately addressed key hazards and risks in the workplace. This included manager and supervisor safety walks to increase workforce discussions about safeguards they were using for their jobs and the application of past lessons learned in those jobs

- ‘Fair Play’ model – This model enables supervisors to consistently reward safe behaviour in the workplace, while providing coaching to workers for safety non-compliances or violations to ensure corrective actions are implemented and unsafe behaviours adjusted. In 2017, the emphasis was on evaluating 2016 program results, providing further awareness training for workers and reinforcing supervisor alignment
- Contractor Safety, Security, Health and Environment Leadership workshop – In September, EMPNG and its contractors led a workshop focused on managing higher-level health and safety risks and identifying safeguards while managing the care of potentially injured workers. Two contractors shared their workplace safety experiences with workshop attendees
- Emergency Alert System – The Emergency Alert System is a digital notification system that provides critical and timely information to workers during an emergency. The system has improved EMPNG’s ability to warn and account for personnel during an emergency. It has been used to disseminate safety and security alerts in Papua New Guinea.

5.5 Security

Increased security risks associated with Papua New Guinea’s national elections, and general law and order issues, resulted in restrictions on movement in the Upstream area for EMPNG and its contractors during 2017. The Papua New Guinean Government provided additional security to protect people in the Hides area while the restrictions were in place.

In June, an EMPNG field worker was kidnapped during internal clan fighting in the Upstream area that was unrelated to EMPNG’s operations. The worker was held for a short time and released unharmed. In November, an incursion of the Angore Camp, by a group of individuals, resulted in two workers being held captive for a short time. The Camp was locked down during this incident to protect the workforce. EMPNG has increased workplace security measures in response to both events and continues to work with the Papua New Guinean Government to protect the company’s workforce and assets.

Following the donation of 12 patrol vehicles to the Royal Papua New Guinea Constabulary in 2016, EMPNG donated an additional three vehicles during 2017. Patrol vehicles help support the work of the Constabulary in maintaining law and order in Papua New Guinea.

EMPNG and the Royal Papua New Guinea Constabulary continue to maintain a Memorandum of Understanding that enables the provision of security in areas around production facilities.

Regular training in the Voluntary Principles on Security and Human Rights also continues to be provided to both government and contracted security personnel.

5.6 Worker welfare and conditions

EMPNG maintains high standards of worker welfare and conditions through implementation of the Labour and Working Conditions Management Plan.

5.6.1 Camps

During 2017, accommodation, recreation and support facilities were refurbished at the LNG Plant, HGCP and Moro B camps.

At the LNG Plant Camp, works were completed on a new dining hall. New air conditioning units were installed in the LNG Plant Camp's 144 rooms and four buses were purchased to transport workers between the LNG Plant and Port Moresby. In November, work began on improving the LNG Plant Camp office area and car park and relocating the guardhouse.

Significant renovations were completed on worker accommodation at the Moro B Camp during 2017. This involved upgrading 55 rooms with new flooring, air conditioning units and bathrooms. Single beds were replaced with double beds in all rooms.

A new gymnasium and recreation hall were also opened at Moro B Camp during the year. The recreation hall includes a new audio/visual system to support camp meetings, training classes and social events.

At the HGCP Camp, new flooring, a new ceiling, air conditioning and additional lighting were installed in the barbecue room. The room contains board games and an audio/visual system to support meetings, classes and social events. Worker accommodation was also improved with new showers, hand basins, mirrors and flooring in shared shower facilities. Work began in late 2017 on roof replacements to worker accommodation and administration buildings at the HGCP Camp.

In addition to infrastructure works, a new audio/visual system was installed at the HGCP Camp's recreational hall during 2017 to support town hall meetings, safety meetings and social events. The installation of cable television at the HGCP clinic during the year helped improve comfort for patients admitted overnight. Roof repairs, electrical upgrades and the installation of cable television were also provided at the on-site police barracks.

Local art and carvings were purchased during 2017 for display in the HGCP dining and recreational halls. Two additional pool tables and additional gym equipment were also purchased for use at the Camp.

Camp catering services continue to meet the needs of all workers, including special dietary requirements, and are maintaining high standards of service even during busy periods, such as when additional workers are on-site for maintenance activities.



Plate 5.10 – Kitchen hand, Rachel Kanage, serving meals for the workforce at the refurbished HGCP Camp

All camp residents rely on regular camp newsletters for updates and general information about production activities. A dedicated television information channel at the HGCP Camp is proving successful in delivering timely communications to residents. Camp committees at both the HGCP and LNG Plant camps are supporting ongoing communication and feedback from camp residents, which is enabling EMPNG to maintain high standards at the camps. For example, the LNG Plant Camp Social Club Committee continues to meet weekly to plan social events such as movie nights, Zumba classes, church services and theme nights for workers.

5.6.2 Labour and working conditions

EMPNG has recognised eight workers at the inaugural Lead Country Manager Awards for outstanding examples of *Em pasin bilong ExxonMobil long PNG* or 'The way we work at ExxonMobil in PNG' behaviours. Workers were recognised for demonstrating key values of Safety, Security, Environment, Integrity, Teamwork and Excellence. See *Case study: New award recognises outstanding employees* for further information.

In January, Operations Administration Assistants Helen Eri and Luana Koniel were appointed to chair the Hides chapter of the EMPNG Women in Energy Network to support some 15 female workers in Hides. EMPNG also has a Women in Energy Network office based in Port Moresby. The Network provides ongoing support to women through training, mentoring programs and fundraising for causes such as breast cancer research.

In September, a new branch of the EMPNG Eda Wanwoks Toastmasters club was launched in Hides to help workers gain greater confidence in public speaking. The Hides branch has 17 members, including eight women. It complements the existing Port Moresby branch, which has 42 members, including 37 women. Toastmasters International is a not-for-profit training organisation that focuses on communication and leadership development.



Plate 5.11 – A meeting of the Eda Wanwoks Toastmasters at the Port Moresby office

EMPNG has Standards of Business Conduct related to ethics, conflicts of interest, corporate assets, anti-corruption, health, safety, environment, alcohol and drug use, equal employment opportunity, harassment and other topics relevant to the production working environment. The Standards also explain EMPNG's procedures including open door communication, which encourages employees to ask questions, voice concerns, escalate issues to senior levels of management when needed, and make appropriate suggestions regarding the company's business practices. All new EMPNG employees continue to receive the Standards of Business Conduct training during their induction process and existing workers are provided with periodic refresher training.

A home ownership program introduced in 2016 has provided an avenue for EMPNG employees to own their own homes. The home ownership program helps eligible employees with raising the equity required to purchase a home, or to purchase the materials to build a home. During the past two years, EMPNG has provided PGK5.1 million (US\$1.58 million) to 69 employees through this program.

In 2017, almost 40 workers participated in the Essential Driver Training program with funding support provided through EMPNG's Social Club. The program has helped workers learn how to drive safely on Papua New Guinea's roads.



Plate 5.12 – Driving instructor Nelson Pasen teaches EMPNG employee, Julie Urulu about vehicle engines

EMPNG continues to host bi-monthly workforce lunch-and-learn sessions with Managing Director, Andrew Barry. The sessions cover topics relevant to the staff and enables them to ask questions directly to the Managing Director. Regular human resources and site management sessions are also conducted to keep workers informed and involved in human resources and site management activities.



EMPNG Managing Director, Andrew Barry (third from right) with Lead Country Manager Award recipients Bona Kolopi, Andrew Hemetsberger, Indi Sorom, Marilyn Wingi and Luis Rojas

Case study

New award recognises outstanding employees

Eight EMPNG workers are the first to be recognised through a new Lead Country Manager Award for outstanding examples of the company's *Em pasin bilong ExxonMobil long PNG* values.

Em pasin bilong ExxonMobil long PNG translates to 'The way we work at ExxonMobil in PNG'. Employees have been recognised for their commitment to demonstrating the *Em pasin bilong ExxonMobil long PNG* values of Safety, Security, Environment, Integrity, Teamwork and Excellence.

An inaugural awards ceremony was held in Port Moresby on 2 December, with each of the award recipients receiving a customised handmade mug, a certificate and a gift voucher valued at PGK3000 (US\$928). Their names will also be displayed on the Lead Country Manager Awards Honour Board at the Port Moresby office.

EMPNG Managing Director, Andrew Barry, said EMPNG's workplace culture integrated the best aspects of the Exxon Mobil Corporation and Papua New Guinean cultures.



"Our values and behaviours are something we encourage all employees to live by every day. They enable us to grow and succeed as a team together. The eight employees we have recognised are good examples of what it means to live the EMPNG values. They are proving to be leaders in their respective fields and we are proud to have them as ambassadors of our company."

Andrew Barry
Managing Director,
EMPNG

Environment Award



"This award reinforces the great work that we have been doing as a team in the field. It shows that we are on the right track to delivering good outcomes for biodiversity in Papua New Guinea."

Anita Mosby
Biodiversity Advisor

Anita has been recognised for her leadership in delivering EMPNG's biodiversity programs. During 2017, Anita spent more than 100 days in the field delivering toolbox talks, conducting field surveys, providing support to monitoring teams and delivering biodiversity education to EMPNG workers and communities surrounding production facilities. Anita strives to find ways to develop the biodiversity program without sacrificing the communities' cultural heritage by making sure EMPNG understands more about the way of life in communities where the company operates.

Some of Anita's key achievements during the year included presenting a regeneration monitoring results paper at an Asia Pacific Health, Safety and Environment Conference, leading two field scientific survey teams for regeneration and biodiversity monitoring, and leading a focal habitat survey.

Case study

New award recognises outstanding employees

Integrity Award



"This award confirms to me that I am achieving what I set out to achieve and delivering tangible results for the company."

Indi Sorom
LNG Plant Cost Analyst

Indi joined EMPNG in July 2010 as part of the first Intake of Operations and Maintenance trainees.

In 2016, Indi moved into her current role and put in extra effort to learn new concepts and systems, which enabled her to successfully combine two different portfolios into her role within a short timeframe.

In addition to her role, Indi was the EMPNG Social Club Vice-President where she provided leadership in the planning and facilitation of EMPNG's Independence Day celebrations, a family fun day and the company Christmas party.

Marilyn began her role in January 2017 and led community affairs security processes in the field for marine safety awareness and the payment of royalties in LNG Plant site villages. Marilyn operates at a high standard and ensures that EMPNG's safety and security controls are integral to community affairs work. She has received positive reports for her leadership from the Operations Integrity Management System External Assessment team. In addition to her role, Marilyn continues to be involved in EMPNG volunteer activities such as the Science Ambassador Program.

Safety Award



"Receiving the Lead Country Manager Award for safety reinforces my commitment to our vision of 'Nobody Gets Hurt!'"

Ivy Konatara
LNG Plant Operations Technician

Ivy has been recognised for her commitment to excellence in EMPNG's safety procedures.

During 2017, Ivy demonstrated ongoing excellence with guiding the production workforce in implementing safety procedures such as the Work Management System and EMPNG's Permit to Work System. She also led continuous improvements in areas such as life-saving actions.

Throughout the year Ivy proactively mentored the third intake of Operations and Maintenance technicians, in EMPNG's safety processes.

Security Award



"This award was such a surprise and an honour because it recognises the work that our team is doing on-site at the LNG Plant and in communities. It was because of the team effectively working together to achieve our goals that we were recognised."

Marilyn Wingi
LNG Plant Site Community Affairs Coordinator



LNG Plant Site Community Affairs Coordinator, Marilyn Wingi donating lap desks to Boera Elementary School teacher, Buruka Maraga

Case study

New award recognises outstanding employees

Excellence Awards



"Getting the award means that what I am doing is right and encourages me to keep it up. It feels great to be recognised."

Andrew Hemetsberger
Machinery Engineer

Andrew is recognised for demonstrating excellence while leading the development of EMPNG's Cranes and Lifting Facility Integrated Management System program.

Andrew provided strong guidance and transparent communications that enabled the program to be fully adopted by the operations team.

Throughout the challenge of implementing the program, Andrew demonstrated a positive workplace attitude to all teams.

Outside of EMPNG, Andrew is an active member of Papua New Guinea's Institute of Engineers.



"I feel very honoured to receive a Lead Country Manager Award. I believe that this award recognises our whole team and the great work that we are doing together. I am fortunate to work with such a highly dedicated, professional group of people."

Jay Lavapo
HGCP Operations Supervisor

Jay helped take EMPNG's performance assessment process to the next level during 2017 by dedicating his time to review draft performance assessment forms, work with each of his direct reports to identify performance gaps, and develop roadmap items to close these gaps. He also updated each of the draft performance assessment forms to better align with employee expectations.



HGCP Operations Supervisor, Jay Lavapo on-the-job at the HGCP

Jay has committed to furthering his education for his own career development while continuing to coach and mentor his team. He continues to lead by example and is well respected by his peers as the first Papua New Guinean field supervisor.

Teamwork Awards



"Receiving the Lead Country Manager Award for Teamwork meant a lot because it recognised the efforts of not only me but that of the Papua New Guinea team. It was a proud moment for me, my family and colleagues."

Bona Kolopi
Sales Support Manager

Bona demonstrated strong teamwork throughout 2017 and was recognised for setting high team standards, conducting effective coaching with employees and showing a strong commitment to organisational effectiveness.

He was also recognised for effective liaison with overseas ExxonMobil offices to achieve the support and tools needed for EMPNG's operations.



"It is an honour to be recognised for teamwork. The most significant lesson learned in my career has been to focus on team achievement as the most effective way to add value to the company, and when I do that, my own contributions are amplified; and thus, the contributions of all other employees – ultimately, we are 'One Team'. In terms of mentoring and coaching, the recognition should also go to our engineers for their willingness to learn and add value with passion daily. They are the real heroes."

Luis Rojas
Machinery Lead

In his role as machinery lead, Luis has been an outstanding enabler in bringing together cross-functional, cross-organisational teams to work towards a common goal. His enthusiastic style has contributed to a positive working environment. Luis is credited with improving the cohesiveness of the machinery team and with helping to increase confidence in machinery engineers. Luis' leadership style is being replicated throughout the workplace as part of EMPNG's 'One Team' culture.

As well as being an outstanding mentor to Papua New Guinean engineers, Luis has been recognised as a role model to fellow expatriates in EMPNG.



Environmental Specialist, Julia Hagoria conducts stormwater quality sampling at the HGCP

6 Environmental management

Environmental management and monitoring procedures enable EMPNG to reduce the potential impact of production activities on the surrounding environment.

6.1 Air

EMPNG monitors ambient air, dust levels and conducts stack testing to reduce the risk of environmental impacts during its operations.

An approved third party contractor conducted ambient air monitoring at the LNG Plant in February to compare ozone emission levels with results recorded from an ambient air monitoring campaign undertaken from 2015 to 2016. The contractor confirmed that ozone levels were within Environment Permit criteria.

Dust monitoring was also conducted at the LNG Plant to measure any impact on ambient air from maintenance operations on the air-cooled heat exchanger. Results showed that all dust emissions were below criteria.

In response to a non-conformance raised in the second half of 2016 at the LNG Plant general waste incinerator, ongoing operational testing and procedural changes were undertaken.

A non-conformance, also recorded as a Severity Level <0 incident, was raised in January when the incinerator registered dioxin/furan levels slightly above criteria. EMPNG is in the process of revising the current permitted emissions criteria for the general waste incinerator to align with small incinerator operations. The new criteria is subject to approval by the Papua New Guinea Conservation and Environment Protection Authority (CEPA).

Stack testing was conducted at the LNG Plant in August and December, with results indicating emissions were within criteria.

The acid gas removal unit vent at the LNG Plant was also tested during the second half of 2017. The vent was found to be operating according to design specifications.

HGCP annual stack testing was conducted in September, with most stacks tested and found to be operating within Environment Permit criteria. The Hides Waste Management Facility incinerator was not tested because it was out-of-service due to a corroded fan duct. This incinerator will be tested in 2018.

EMPNG calculates and reports total greenhouse gas emissions, including fuel gas use, on an annual basis. During 2017, EMPNG generated approximately 2110 kilotonnes of carbon dioxide equivalent, which was primarily from gas turbine fuel consumption at the LNG Plant and HGCP. Emissions remain consistent with 2016 because of steady state operations.

Flaring was 60 percent lower than 2016, mainly because of reduction in equipment downtime and upgrades such as flare valve replacements at the HGCP and flare meter calibrations to ensure more accurate readings.

6.2 Noise

No noise-related incidents or near misses were reported at any EMPNG facility during 2017.

Biannual monitoring conducted at the LNG Plant and Port Moresby office in June and November, and at the HGCP in June and December, showed that noise levels at all facilities complied with Environment Permit criteria. The Hides Waste Management Facility was not included in the second biannual monitoring event because the incinerator was out-of-service due to a corroded fan duct.

6.3 Water

Water used for production is extracted from sources such as groundwater, seawater and streams. EMPNG monitors the amount of water extracted to ensure conformance with permitted extraction volumes.

Regular testing is undertaken to confirm the quality of extracted water. Processed wastewater is checked to ensure it conforms to Environment Permit requirements and meets the guidelines for its intended use.



Plate 6.1 – Environmental Specialist, Anzylyn Neil undertaking noise monitoring at the LNG Plant site

6.3.1 Consumption

Water is used for worker camps, safety showers, dust suppression, fire water systems and the cleaning of utilities.

In the Upstream area, freshwater is extracted from groundwater sources and streams, while seawater is used for LNG Plant operations.

Approximately 116,760 kilolitres of groundwater was extracted for use in the Upstream area during 2017.

An analysis of water quality showed the extracted groundwater complied with EMPNG's raw water quality criteria. Figure 6.1 shows volumes of water taken from each groundwater extraction source in 2017.

No water was extracted from surface streams during 2017.

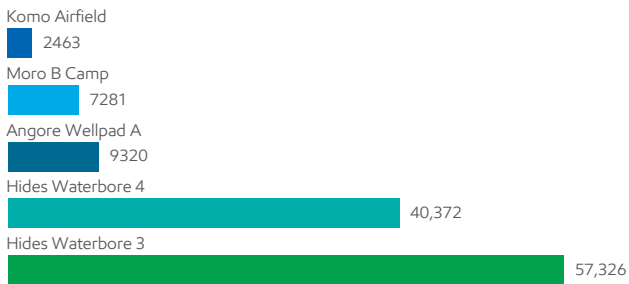
The Port Moresby office draws water from the Port Moresby Municipal water supply. During 2017, the Port Moresby office used 15,136 kilolitres of water.

High quality recycled water is produced by the on-site wastewater treatment plant as part of the site's recycling initiatives. During 2017, more than 5000 kilolitres of recycled water was produced and used in the site's irrigation system.

At the LNG Plant, 577,683 kilolitres of seawater was extracted during the year to supply the desalination plant, which generated 80,396 kilolitres of potable water for production use.

Groundwater extraction

Figure 6.1 – Volume (kilolitres) by extraction source for 2017



6.3.2 Water quality monitoring

EMPNG conducts regular monitoring to confirm the quality of wastewater effluent and the health of receiving water bodies.

During 2017, the LNG Plant dissolved air flotation unit recorded oil and grease levels above the Environmental Management Plan discharge limit, although the discharge was within criteria at the retention pond, resulting in one non-conformance. Following this isolated incident, the system was stabilised to prevent a recurrence. Another non-conformance was recorded later in the year when ammonia levels from the dissolved air flotation unit were above criteria. Maintenance works were conducted and weekly monitoring showed a reduction in ammonia levels.

Annual stormwater sampling at the LNG Plant recorded total suspended solids outside of stormwater criteria, which resulted in one non-conformance. The sample site was cleared of debris, including sediment and grass. Grass cutting practices were reviewed to allow increased grass length to encourage better filtration of stormwater. Verification sampling will be conducted in the next storm event at the monitoring site and in the receiving environment.

Two non-conformances were recorded at the LNG Plant site wastewater treatment plant for faecal coliforms at end-of-pipe that were higher than the discharge limit. To address this issue, a new disinfection unit will be installed during 2018. A secondary wastewater treatment plant will be used until installation of the new unit is complete.

Seven non-conformances were recorded at the LNG Plant retention pond in 2017, mostly for high pH levels as well as faecal coliforms, dissolved oxygen, turbidity and total suspended solids. This was due to ongoing algae respiration and decomposition in the pond. To address this, various management strategies were implemented including reducing operating levels, algae removal, chlorine dosing and discharge control.

A further seven non-conformances, also recorded as Severity Level 0 incidents, were registered for elevated pH and faecal coliform levels at the LNG Plant mixing pit, which receives flows from the retention pond and wastewater treatment plant. This is being addressed through the management strategies at the retention pond and planned replacement

of the disinfection unit at the LNG Plant site wastewater treatment plant. Weekly monitoring is also being conducted.

In the Upstream area, eight non-conformances were reported at the Moro B wastewater treatment plant for ammonia-nitrogen and oil and grease exceedances. This was due to delayed sludge removal and inconsistent chemical dosing. The chemical dosing and maintenance schedule was adjusted to address the issue. The Angore wastewater treatment plant recorded two non-conformances for ammonia-nitrogen and chemical oxygen demand exceedances because of time requirements for fresh sludge stabilisation.

At the HGCP wastewater treatment plant eight non-conformances were recorded for exceedances of parameters including chemical oxygen demand and faecal coliform levels. This was caused by a high volume of waste entering the holding tanks and agitating settled sediments. Follow-up sampling at the receiving environment confirmed faecal coliforms were above criteria, resulting in two non-conformances, also recorded as Severity Level 0 incidents. Wastewater treatment plant operators reduced the inflow to minimise the risk of sediment impacting the disinfection process.



Plate 6.2 – Environmental Advisor, Nicole Yasi sampling groundwater wells

A non-conformance was recorded for elevated total suspended solids and turbidity levels at the HGCP during annual stormwater sampling. Maintenance teams are installing additional sedimentation and erosion control measures to reduce the amount of debris entering drains.

Biannual groundwater sampling was conducted at the HGCP and Hides Waste Management Facility in March and at the LNG Plant in October.

All the LNG Plant site's groundwater quality parameters were within criteria, except for faecal coliforms. Further investigations are being undertaken to determine the cause of these results.

While HGCP groundwater monitoring wells were compliant with sampling limits; copper, iron and faecal coliform levels were above criteria at one Hides Waste Management Facility monitoring well. An approved third party consultant investigation resulted in the expansion of testing parameters as part of ongoing monitoring.

6.4 Materials management

Wherever possible, EMPNG aims to avoid significant impacts from the use of raw materials. Occasionally, some aggregate and timber is required for general maintenance, repair works or special projects.

In early 2017, EMPNG assessed and approved the use of one formerly disused quarry in Kopi. A local Lanco was engaged to extract 3059 cubic metres of limestone from the quarry during the year for maintenance and repair of the Kopi Scraper Station Access Road.

A second Lanco was engaged to supply 261 cubic metres of limestone from a quarry previously assessed and approved for use by EMPNG for maintenance and repair of an access road to the Main Line Valve at Kilometre Point 85.

Another 6425 cubic metres of limestone was purchased from a third party quarry near Kutubu for maintenance and repair of the access road leading to the Kutubu Main Line Valve.

Approximately 3185 cubic metres of limestone was sourced from Para Quarry for road maintenance and erosion repair works at the HGCP during 2017. Para Quarry is operated by a Lanco under its own environment permit.

EMPNG purchased 371 cubic metres of concrete from a Lanco for construction and security fence upgrade works at the HGCP and Hides Wellpads, as well as upgrade works at the HGCP wastewater treatment plant.

An additional 455 cubic metres of concrete was purchased for the Angore Gathering System.

Fifty cubic metres of gravel was purchased from a Lanco for drainage works at the HGCP.

Almost 16 cubic metres of timber was purchased from third party suppliers for security upgrade works at the HGCP and Hides Wellpads, and other works during 2017. Approximately 37.5 cubic metres of timber was purchased from third party suppliers for concrete forming works for the Angore Gathering System. EMPNG also purchased 10 cubic metres of timber from a third party supplier for other project works.

At the LNG Plant, almost 120 cubic metres of concrete was sourced from a third party supplier for the construction of a sludge drying area and upgrades to camp facilities.

Almost 303 cubic metres of concrete was purchased from a third party supplier for the construction of a new sports complex and upgrades to infrastructure such as roads and a bus driveway.

Approximately 1198 cubic metres of road base was also sourced from two third party suppliers for construction of the new sports complex.

Approximately 156 cubic metres of rock was sourced from a third party supplier for the construction of gabions, used for erosion prevention, at the Port Moresby office.

6.5 Spill prevention and response

EMPNG maintains dedicated plans, personnel, equipment and workforce training to reduce the likelihood and consequences of emergency situations. This also applies to the company's gaseous and liquid hydrocarbon spill prevention and response, as outlined in *Case study: Emergency response in good hands*.

During 2017, EMPNG recorded 65 low-level spill incidents at production operations, involving 53 hydrocarbon spills, six chemical spills and six other spills. Two low-level spill incidents occurred at the Port Moresby office and two additional spills (one hydrocarbon and one sludge) were attributable to third parties. These were tracked and appropriate assistance provided. Most of the spills were less than 5 litres. All spills were responded to appropriately and in a timely manner and had no significant environmental impact. EMPNG and its contractors continue to conduct dedicated spill prevention toolbox talks with their relevant work teams.

Twenty-two near misses were recorded during 2017. These involved potential spills to impermeable surfaces.

Eleven field deployment spill response drills and two desktop spill response drills were conducted during the year. Scenarios included an onshore spill response from a tanker near Caution Bay, a chemical spill and fire at the HGCP, a shoreline response and boat dispersant application exercise, an inland spill response in relation to the Hides Wellpad B condensate pipeline and a condensate leak from a manhole flange with an injured worker.

All field deployment drills included field discussions, full equipment deployment and clean-up strategies.

6.6 Waste management

In April, EMPNG held a workshop at the LNG Plant to examine the company's long-term Waste Management Strategy for sustained 30-year operation. The workshop included discussions on potential commercial opportunities and improvements to solid waste and wastewater disposal methods.

EMPNG also reached an agreement with Oil Search Limited for both companies to support each other with managing waste in the Upstream area.

As part of the agreement, Oil Search Limited is helping process EMPNG waste from Moro B Camp.

In September, CEPA representatives conducted a regulatory inspection of the LNG Plant's waste management facility to view the site's waste management processes and clarify some questions they had regarding EMPNG's on-site waste management procedures.

Waste reuse and recycling initiatives continue to be used at all worksites, in collaboration with approved third party contractors, to reduce the amount of waste sent to landfill.

During 2017, an additional Papua New Guinean contractor was audited and approved to accept recyclable non-restricted waste such as scrap metal and plastics. As a result, more than 30 tonnes of scrap metal and almost 5 tonnes of plastic bottles were sent to this newly approved contractor for recycling.

In July, EMPNG audited and approved the use of a new waste oil processing unit by the company's main waste management contractor. The new unit uses proven waste separation technology that can process waste fuels and oils to fuel grade standards. This enables the fuel to be reused in Papua New Guinea rather than incinerated or exported overseas.

EMPNG is also supporting this contractor with the development of an integrated waste management facility at a brownfield location between the LNG Plant and Port Moresby to ensure the facility meets EMPNG's environmental and operational requirements.

Following installation of the first liquid food composter at the HGCP in November 2016, a second unit was installed at the end of June. Another unit was also installed at the LNG Plant Camp during 2017.

The composters are automatic commercial biodigesters that decompose solid and liquid food waste into grey water that is safely released to the sewage system for further treatment. These units are helping to improve the management of food waste, resulting in less waste being generated requiring incineration and a subsequent reduction in air emissions. In total, 81 tonnes of waste was managed through the liquid food composters during 2017.

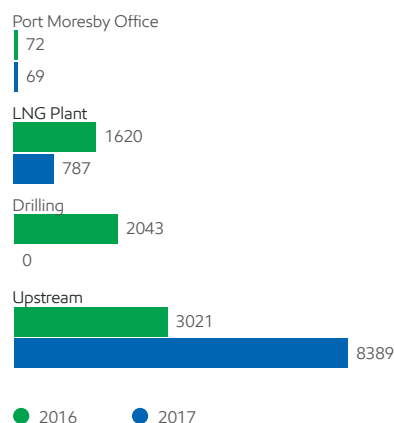
A register of all waste received at EMPNG's processing facilities is maintained to enable tracking and analysis of waste management. The register includes information on waste transfer numbers, waste classifications, quantities and treatment/disposal methods.

In the Upstream area, waste volumes increased in early 2017 due to demobilisation of the Komo Airfield Camp. Waste volumes decreased in the second half of the year after demobilisation activities were complete. Figure 6.2 shows waste volumes produced at both the Upstream area and LNG Plant in 2017.

Ninety-eight tonnes of waste oil generated during 2016 and 2017 was sent to approved third party facilities to be reused as fuel, while approximately 77 tonnes of recyclable waste, such as scrap metal and spent batteries, was sent from the LNG Plant to an approved facility for recycling.

Generated waste

Figure 6.2 – Weight (tonnes) by source



Two-hundred and forty litres of methylated spirits was donated to the University of Papua New Guinea's Science Department for reuse in their laboratories, and 20 clean empty drums were sent to the Baruni Landfill site to be re-used as part of their landfill improvement program during 2017.

In April, one low-level incident involving a spill of less than 1 litre of oily water was recorded at the Hides Waste Management Facility when oily rags and oil filters were incorrectly disposed in a general waste skip bin. Workers were reminded during toolbox talks about the importance of correct waste segregation and the correct disposal of oily materials.

In early June, operation of the general waste incinerator at the LNG Plant stopped due to a damaged stack, which was replaced. In July, the incinerator ceased operation again when the lime hopper motor failed. Repairs were conducted and the incinerator returned to operation from September. While the incinerator was being repaired, non-restricted combustible waste was transferred to landfill and medical waste was held in secure storage.

Numerous technical issues resulted in the LNG Plant sludge incinerator being inoperable during 2017. EMPNG is managing the treatment of sludge waste from the LNG Plant Camp lift station and grease waste from camp kitchens by dewatering and drying prior to landfilling.

In the last week of June, the high temperature incinerator at the Hides Waste Management Facility was shut down because of a corroded fan duct. While awaiting repair, all restricted combustible waste was stored on-site and non-restricted waste was sent to landfill.

The predominant waste type during 2017 was construction waste from demobilisation of the Komo Airfield Camp, followed by food waste and general office/accommodation refuse. The predominant disposal method continues to be on-site landfill. Solid waste disposal methods used during 2017 are shown in Figure 6.3.



EMPNG's fire crew with a rescue vehicle and aircraft at Komo Airfield

Case study

Emergency response in good hands

A small team of Papua New Guinean workers is playing an important role in providing emergency response for all EMPNG facilities.

EMPNG's Emergency Response team is capable of responding to emergencies including rescues, spills and fires. Each member of the Emergency Response team has completed some 650 hours of specialist training in both Papua New Guinea and Australia.

The training encompasses both theoretical and practical emergency response drills such as aviation incidents, fires, spills and injured person rescues. All team members carry a personal training matrix that details their competencies and the training they have completed.



EMPNG Emergency Response team members participate in a fire response drill at the Queensland Combined Emergency Services Academy in Australia



EMPNG Emergency Response team members practice their firefighting skills during a fire response drill

This training includes breathing apparatus, confined space entry and rescue, gas testing, rope rescue and boat handling skills.

Case study

Emergency response in good hands



EMPNG Emergency Response team members Fredrick Haru and Bernard Sova participate in training at the Falck Fire and Emergency Training Base in Western Australia



LNG Plant Certificate III in Public Safety recipients (from left) Gorgo Koani, Hisiu Sere, Andrew Smith, Guba Mea, Anthony Nicoloff, Hebore Lamuia, Jason Matheson, Mamata Gaoma and Jason Craig

As part of EMPNG's ongoing investment in developing the technical skills of Papua New Guinean workers, advanced fire fighter training is provided through a specialist third party contractor.

Participants who complete the advanced program qualify for internationally recognised certification from both the Joint Oil Industry Fire Forum and Williams Fire and Hazard Control.

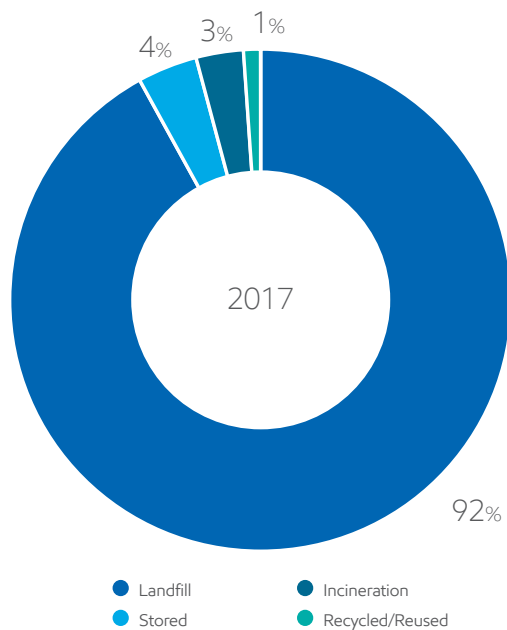
Fire Officer training is also provided to Emergency Response team members who complete the fire fighter program and show an aptitude for leadership. Participants who complete Fire Officer training qualify for National Training Standards (Australia) certification in accordance with the Australian Qualifications Training Framework in Public Safety.



Fire Officers Anthony Nicoloff and Andrew Smith (front row) with fire fighters (back row from left) Matmata Gaoma, Hisiu Sere, Gorgo Koani, Guba Mea and Hebore Lamuia

Waste disposal

Figure 6.3 – Percentage by disposal method



6.7 Reinstatement, erosion and sediment control

The effectiveness of erosion and sediment control in areas near production facilities is determined through aerial and ground inspections. Clans involved in Clan ROW Maintenance Agreements also provide information to EMPNG. Specialist teams are engaged to repair and maintain EMPNG's erosion and sediment control measures.

During 2017, general maintenance and repair works were undertaken on the Hides Spine ROW at Kilometre Point 5 and along the main pipeline ROW between the HGCP and Tagari River, at Kilometre Points 18, 64, 98 and between Kilometre Points 58 and 61, and 117 and 119. Works included identifying and sealing ground surface tension cracks, clearing vegetation and silt from berms and drainage outlets, reinforcing drainage outlets, installing additional erosion controls, constructing additional berms and re-contouring existing berms. Erosion repair works were completed at Kilometre Point 9 where a small landslide had occurred following heavy rainfall, and an undersized culvert was replaced at Kilometre Point 10 to improve stream flow. Repair works conducted at Kilometre Point 64 were associated with a landslide that had occurred following heavy rainfall. Sinkholes that appeared along the main pipeline ROW at Kilometre Point 115 and between Kilometre Points 141 and 150 were also repaired to prevent further subsidence.



Plate 6.3 – Hides Spine reinstatement near Hides Wellpads D and E side-cast



Plate 6.4 – Hides Spine reinstatement at the first road crossing past Hides Wellpad B

At the HGCP, sediment control measures were installed along drainage lines and regular inspection and maintenance of these structures was conducted.

Repairs to drainage channels and erosion control structures progressed on the northwest side of Komo Airfield during the first half of 2017. The repairs could not progress during the second half of the year due to security restrictions in the Upstream area. Vandalism of erosion and sediment controls has been an ongoing issue at the Airfield.

During 2017, monthly monitoring was conducted at the Angore Gathering System to ensure temporary erosion and sediment control measures installed early in the year were adequate along the greenfield section of the ROW in preparation for future pipeline installation.



The New Guinea dainty treefrog (Litoria auae) is found only in the forested lowlands and foothills of southern New Guinea. It is common in the Kikori Delta where EMPNG's Environment team encountered it during a 2017 biodiversity survey

7 Biodiversity

To preserve Papua New Guinea's unique biodiversity, EMPNG implements biodiversity management and monitoring programs.

7.1 Biodiversity management

EMPNG has developed a Biodiversity Implementation and Monitoring Program, which describes the implementation, monitoring and evaluation process the company is following to achieve objectives of the Biodiversity Strategy.

In 2017, work continued on Programmed Monitoring Activities (PMAs) and components of the offset program, as outlined in the Biodiversity Implementation and Monitoring Program.

PMA1 – Remote Sensing of Broadscale Land Cover

Following the capture of Landsat and high-resolution RapidEye satellite imagery in 2013 and 2015, a smaller dataset was captured during 2017.

The new imagery is undergoing analysis, with results expected in 2018. Field trials were also conducted on a new Field Remote Sensing Environment Data (FRED) mobile application to support ground-truthing of PMA1 imagery.

Up Close: FRED saves time in the field

The new FRED mobile application is enabling EMPNG's field environmental specialists to save time with the collection of environmental monitoring data.

Field environmental specialists began using the FRED app in February to monitor land use and the condition of vegetation. The FRED app is also being used to monitor the condition of focal habitats as part of the biodiversity program. It saves time by enabling users to digitally collect and update field information, including photographs, maps and videos, to an online platform that can be compared with existing data to provide an accurate assessment of environmental conditions in and around production facilities.



"The FRED app enables our teams to view and manipulate spatial data on any mobile device and populate field data sheets with simple drop-down menus.

Prior to this app, our environmental specialists had to collect handwritten information in the field and then manually enter it into EMPNG's online monitoring system.

This new system not only helps to automate the workflow, it is enabling improved accuracy of the data collected."

**Dennis Vidmar
General Manager – Safety, Health and Environment
EMPNG**



EMPNG Environmental Advisor, Anita Mosby and The New Guinea Binatang Research Center Entomologist, Pagi Toko, using the FRED app for environmental monitoring

PMA2 – Condition Surveys of Focal Habitats and Significant Ecological Features

PMA2 involves monitoring pre-defined focal habitats and significant ecological features near PNG LNG facilities to assess their condition and ecological functionality. The 2017 PMA2 condition surveys focused on surveying focal habitats along the Hides Spine.

The focal habitats that were inspected showed no sign of impact from PNG LNG activities. A survey of focal habitats on the southern part of the PNG LNG area will be completed in 2018.

PMA3 – Biodiversity Surveys

The second PMA3 biodiversity survey was conducted in June to collect data that could be assessed to identify trends in flora and fauna species diversity and abundance in the Upstream area, as well as protected areas enhanced and/or established as part of the offset program.

The PMA3 Survey team, consisting of both Papua New Guinean and international scientists, surveyed two permanent Biodiversity Assessment Areas located on Hides Ridge and the Agogo Range near Moro. The survey covered non-volant mammals, bats, birds and frogs. Plant plots established during 2015 were not surveyed, however, invasive species were monitored, particularly rodents, which are recognised as a threat to ecosystem health. An analysis is being conducted on the data collected.

Due to the success of the 2015 camera trap program in monitoring species diversity and abundance, the 2017 program has been expanded to incorporate 80 cameras at four sites within the Biodiversity Assessment Areas, with ground trapping of non-volant mammals being reduced in future surveys.



Plate 7.1 – A blue-legged tarantula photographed at Veiru in the Kikori Delta during a PMA3 biodiversity survey in 2017

Results from the 2015 PMA3 survey have been published in a book titled *Biodiversity assessment of the PNG LNG Upstream Project Area, Southern Highlands and Hela Provinces, Papua New Guinea*.

Five hundred copies of the book were printed and are being distributed to tertiary institutions and public libraries within Papua New Guinea and Australia.

An electronic copy of the book is available on the PNG LNG website. The formal launch of the book is scheduled for the first half of 2018.



Visit the website at
www.pnglng.com

Up Close: Frog spotting in Moro

During regular biodiversity surveys, EMPNG's Environment team often encounters some rare animal and plant species only found in Papua New Guinea.

One example is the yellow-spotted nursery frog (*Oreophryne flavomaculata*), which was identified during a survey conducted on the Agogo Range near Moro in 2017. This frog species is only found in a few locations in the cool, rain-soaked mountains of Papua New Guinea. Like many frogs living in the wet forests of New Guinea, the yellow-spotted nursery frog does not lay its eggs in water. Instead this frog, which grows to less than 3 centimetres in length, lays about a dozen eggs attached to the surface of leaves in the forest understory where embryos develop and hatch into froglets. Males of this recently described species are conscientious fathers, returning from their daytime retreats every night to guard their offspring.



A male yellow-spotted nursery frog protecting eggs

Offset program

During 2017, biodiversity field activities focused on progressing the five components of the offset program:

- Component 1: Protected area planning
- Component 2: Support the national biodiversity strategy
- Component 3: Build conservation capacity
- Component 4: Enhance existing protected areas
- Component 5: Establish new protected areas.

Component 1 involves EMPNG supporting CEPA with the development of a Protected Area System Plan for the Kikori River Basin. EMPNG engaged the Wildlife Conservation Society to lead the delivery of this component because of its expertise in regional conservation planning.

During 2017, the Wildlife Conservation Society completed a technical report about optimal conservation areas in Papua New Guinea based on a Marxan analysis conducted in 2016.

Component 2 aims to support CEPA with its implementation of the National Biodiversity Strategy and Action Plan, which was launched in 2007. The National Biodiversity Strategy and Action Plan enables Papua New Guinea to meet its obligations under the *Convention on Biological Diversity* and other multilateral agreements.

In March, some 55 Papua New Guinean conservation representatives attended a Communicating Conservation Practice in Papua New Guinea workshop.

The workshop provided updates on the status of activities pertaining to the National Biodiversity Strategy and Action Plan and covered topics such as the protection of endemic species, the trade of endemic and other endangered species, the status of species such as the Manus green tree snail (*Papustyla pulcherrima*), tree kangaroos (*Dendrolagus* spp.) and the Queen Alexandra's birdwing (*Ornithoptera alexandrae*) butterfly and the management of crocodiles in the Sepik River.



Plate 7.2 – Attendees at the Communicating Conservation Practice in Papua New Guinea workshop

Under the Component 3 requirement, the University of Papua New Guinea has finalised course programs for a Postgraduate Diploma and a Master's degree in Conservation Management in partnership with EMPNG and the Mama Graun Conservation Trust Fund.

Two conservation certificate courses were conducted in 2017, with the first delivered on Motupore Island in September.



Plate 7.3 – The first certificate course participants at Motupore Island in September

Twenty-five participants attended from the Kokoda Initiative supporting the Kokoda Track, which starts at Owers' Corner in the Central Province and crosses the Owen Stanley Range to finish at Kokoda in the Northern Province. The second course was delivered in December, with 24 participants from Morobe, Milne Bay and Central Province community conservation areas.

In December, four scholarships were awarded for the new Master's degree in Conservation Management at the University of Papua New Guinea as described in *Case study: New breed of environmental champions*.

Component 4 aims to enhance the capacity of the Lake Kutubu Wildlife Management Area (WMA), which is operated on a volunteer basis by Lake Kutubu community members. During 2017, biodiversity surveys were conducted on two sites in the northwest section of the Lake Kutubu area.

In May, EMPNG donated a boat to the Lake Kutubu WMA Committee to support their efforts in monitoring the Lake Kutubu area and raising conservation awareness with local communities. In June, the Lake Kutubu WMA Committee conducted environmental education sessions with seven schools in the Lake Kutubu area as part of World Environment Day activities.

The Lake Kutubu WMA Committee also set up an information booth at the Kutubu Kundu and Digaso Festival in September to raise awareness with local communities about their activities. As part of the festival, the Lake Kutubu WMA Committee hosted the first canoe festival at Tugiri Village.



Plate 7.4 – Race participants at the inaugural canoe festival at Tugiri Village

The Lake Kutubu WMA Committee also hosted three officials from the Ramsar Secretariat in September. Ramsar is a global organisation that manages the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (Ramsar Convention). Lake Kutubu became a registered Ramsar site in 1998.

The Lake Kutubu WMA Committee has become successful with fundraising, securing a grant from the United Nations Development Programme to support a local livelihood project. The project will focus on the promotion of alternative protein sources to relieve pressure on fishing in Lake Kutubu.

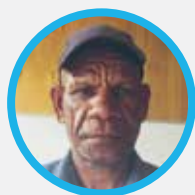
Community planning workshops will be conducted in 2018, with the livelihood project to be implemented later in the year.

Up Close: New boat for Lake Kutubu Wildlife Management Area

EMPNG has donated a new boat to the Lake Kutubu WMA Committee to support their efforts in preserving Lake Kutubu and its surrounding waterways.

In May, EMPNG donated a 20-foot aluminium flat bottom boat with a 40 horsepower motor, which will enable Committee members to better monitor and protect local waterways.

Lake Kutubu WMA Committee Chairman, Lawrence Kage, said the boat would play an important role in helping the Committee to preserve the Lake Kutubu area for future generations.



"This boat will enable our team to more effectively visit all the areas of Lake Kutubu for our monitoring work. It will also enable us to reach more villages to provide information about conservation efforts and educate people about how they can support the protection of Lake Kutubu."

Lawrence Kage
Chairman
Lake Kutubu WMA Committee



Lake Kutubu WMA Committee Chairman, Lawrence Kage receiving keys to the new boat from EMPNG Pipeline ROW Supervisor, George Shaw

Component 5 aims to help establish new community-based protected areas in the Upstream area that are representative of the biodiversity values recognised by EMPNG. In April, biodiversity surveys were conducted in the Lower Kikori region at Wau Creek and Veiru Village. Engagements with communities in Hides and the Lower Kikori area progressed throughout 2017 to raise awareness about conservation management and invasive species.

In September, EMPNG met with two community women's groups located near the HGCP to gauge their views on conservation in the Hides area. The group was receptive and follow-up meetings are planned in 2018.



Plate 7.5 – A Kapote Village women's group attending a conservation awareness session with EMPNG

In November, EMPNG conducted engagements with Veiru, Apeawa, Babaguna, Bisi, Verabairi and Aidi'io villages in the Lower Kikori region.

Initial engagements were conducted in Aidi'io, Babaguna and Verabairi villages. In the other villages, which EMPNG had previously visited, field teams were shown sites where the communities felt they could commit to conservation. These areas will be mapped and the maps returned to the communities for further discussion.

7.2 Ecological management

During 2017, mangrove and vegetation regeneration monitoring was conducted at EMPNG worksites.

Monitoring found that mangroves along the pipeline ROW and at the LNG Plant site were continuing to grow through natural regeneration.

The most significant growth in 2017 was observed for the grey mangrove (*Avicenia marina*) species.

The second survey of regeneration monitoring at the HGCP, Moro and Omati, was completed following an initial survey conducted in 2015.

Additional monitoring at Gobe and Kopi was completed in November. An analysis of the data collected will be conducted in 2018.

Up Close: Connecting with nature

EMPNG joined schools and local community groups in numerous activities during 2017 to connect people with nature as part of World Wildlife Day and World Environment Day.

In March, more than 2300 people attended a World Wildlife Day event involving more than 15 conservation organisations at the Port Moresby Nature Park. The event was held in partnership with the Nature Park and EMPNG, which provided a PGK50,000 (US\$15,725) donation as well as some 60 volunteers to assist with activity booths and face painting for children on the day. World Wildlife Day at the Nature Park was part of a three-day conservation program, which included a two-day Endemic and Flagship Species Workshop that EMPNG also supported.

To commemorate the World Environment Day theme 'Connecting People with Nature', the Lake Kutubu WMA Committee conducted environmental education sessions with Upstream area schools in early June.

During the education sessions, the schools participated in environmental quizzes and colouring competitions, with prizes provided by EMPNG.



Toea gets a lesson about snakes from Port Moresby Nature Park Wildlife Officer, Joshua Heni, during World Wildlife Day celebrations



From left to right (back row): University of Papua New Guinea Professor of Biology, Simon Saulei, Deputy Dean of the University of Papua New Guinea School of Natural and Physical Sciences, Beatrix Waiin, EMPNG Biodiversity Advisor, Kalyna Taule, Executive Dean of the University of Papua New Guinea School of Natural and Physical Sciences, Professor Chalapan Kaluwin, scholarship recipients Nigel Baro, Estelle Gombo and Barbara Masike, and Executive Director Mama Graun Conservation Trust Fund, Paul Lokani. Front row: EMPNG General Manager – Environment and Regulatory Affairs, Laura Ann Dresser, scholarship recipient, Naomi Vincent and EMPNG General Manager – Safety, Health and Environment, Dennis Vidmar

Case study

New breed of environmental champions

Four Papua New Guinean citizens have received scholarships for the new Master’s degree in Conservation Management through the University of Papua New Guinea.

The scholarships, funded by EMPNG in partnership with the Mama Graun Conservation Trust Fund under Component 3 of the biodiversity offset program, will enable these students to complete conservation studies and research projects that will ultimately make a difference to preserving Papua New Guinea’s unique biodiversity.

Esthel Gombo from Uwe Village in Oro Province is using her scholarship to study biodiversity response to climate change, in particular the effects of rising sea levels on the salinity of common food crops, such as sweet potato, along Papua New Guinea’s coastline.

Esthel, who is a teacher, said the scholarship would help her long-term career goal of becoming an education researcher so that she could apply her knowledge to designing new gardening and cultivation methods and raising awareness about the types of crops that can be used for food security in Papua New Guinea.



“This scholarship will make me more knowledgeable about the rising negative effects of changes in climatic factors. I can then be helpful in contributing to the effort of incorporating the knowledge about climate change and its effect on common crops into the national education curriculum.”

Esthel Gombo
Scholarship recipient

Barbara Masike from Bougainville is the Program Director for The Nature Conservancy in Papua New Guinea. She works on projects covering the forestry and fisheries sector, food security, climate change, and the Coral Triangle Initiative across Manus, Madang, East and West New Britain.

In 2016, she was part of a group of women from Papua New Guinea who developed an initiative to work on a mangrove

Case study

New breed of environmental champions

project called Mangoro Maket Meri, through which they would create a network of women exploring market opportunities and business ideas around mangrove tourism and the long-term benefit of a mangrove carbon savings bank. Her Master's research focuses on helping women find better markets for products sourced from mangrove environments such as crabs, fish, prawns and craft.



"I plan to help the growth of the Mangoro Maket Meri program and support the mentoring and capacity building of women in Papua New Guinea from mangrove areas, so that they can realise increased benefits from mangroves and understand the importance of managing mangrove habitats.

The building blocks of conservation in Papua New Guinea lie at the community level where conservation must be connected to sustainable livelihoods. I believe that this scholarship will change my life to have an increased understanding of the hardships of women from mangrove communities and how they earn an income from products such as fish, crabs, and prawns. I know that communities will support conservation if they benefit from it both culturally and economically. It is the economic benefit that I would like to research and strengthen ways for women to gain an economic benefit from mangroves and the conservation work they do."

Barbara Masike
Scholarship recipient

Nigel Baro from the Central Province is a Technical Assistant with the Biology Division, School of Natural and Physical Sciences, University of Papua New Guinea.

One of his long-term career goals is to become a leading researcher in the field of ethnobiology and biocultural studies, with a focus on the conservation and sustainable use of natural resources in Papua New Guinea.

After completing his studies, Nigel plans to secure a research position with a tertiary or other research institution, where he can collaborate with other conservation researchers.



"This scholarship provides a great opportunity to broaden my understanding of relevant conservation issues here in Papua New Guinea. My study seeks to identify the main factors threatening Papua New Guinea's unique biocultural diversity in terms of language shift and loss of ethnobiological knowledge within local communities. This research also seeks to examine the importance of local languages in biodiversity conservation in Papua New Guinea because the development of any conservation strategy or policy should consider safeguarding both biological and cultural diversity."

Nigel Baro
Scholarship recipient

Naomi Vincent from Port Moresby has recently left her position as a Scientific Officer with the Papua New Guinea Institute of Medical Research to pursue her dream to undertake biodiversity and conservation research through the Master's degree in Conservation Management.



"I have always wanted to do research. I hope to be educated and experienced enough to one day conduct my own research relating to coral reefs and adjacent ecosystems.

This scholarship is already changing my life because it's my dream and it's finally happening. I hope this will open more doors for new and exciting discoveries in my career path. I think that people in many parts of Papua New Guinea still need to know more about how to protect their natural resources and take pride and ownership of these resources."

Naomi Vincent
Scholarship recipient



The Master's degree in Conservation Management will support conservation studies and research projects to help protect the unique biodiversity of Papua New Guinea



Plate 7.6 – Part of the ROW at the LNG Plant site showing grey mangrove regrowth at the mid-tide mark

Two sandalwood (*Santalum macgregorii*) trees that are regularly monitored at the LNG Plant site remained in good health in the first half of 2017. However, a fire in the second half of the year occurred near one of the trees and, although no direct damage was evident, future monitoring will assess whether there was heat damage due to the proximity of the fire.

7.3 Quarantine management

EMPNG and its contractors comply with the procedures and regulations of Papua New Guinea’s National Agriculture Quarantine and Inspection Authority (NAQIA) for all freight imported into the country.

During 2017, EMPNG received 762 shipments into Papua New Guinea. Of these, 119 shipments (16 percent) were inspected and 16 of the inspected shipments (13 percent) required re-fumigation to comply with NAQIA standards.

There was an increase in the number of shipments in 2017 compared to 690 shipments received in 2016 because of maintenance work and construction of the Angore Gathering System.

7.4 Invasive species, pests and plant pathogens

EMPNG, in partnership with ecosystem management specialist Biotropica Australia and Papua New Guinea’s NAQIA, launched *Exotic Plants of the Kikori River Basin* during 2017. The book aims to help identify invasive weed species in the Kikori River Basin. Along with 800 copies of the book, EMPNG has provided weed identification cards to NAQIA to support invasive species awareness with their inspection teams.

EMPNG continues to educate field teams and communities about invasive species management. For example, invasive species education was provided to more than 120 EMPNG employees and contractors including drivers, housekeeping and grounds keeping workers, the Waste Management team and the HGCP Leadership team during 2017.

Education was also provided to a women’s group and a youth group in Hides. The Yaka Dish Youth Group used EMPNG’s *Weed Identification Manual* to identify and remove Priority 1 weeds from the youth centre yard. The Youth Group is located near the Hides Vehicle Washdown Facility on the Hides Wellpad Access Road.

Up Close: New book identifies weed species



EMPNG General Manager – Environment and Regulatory Affairs, Laura Ann Dresser and Acting NAQIA General Manager – Technical Division, Pere Kokoa at the book launch

EMPNG and NAQIA have jointly launched a new book to help workers identify and control invasive weed species in Papua New Guinea. The book, *Exotic Plants of the Kikori River Basin*, provides information and images about the types of weeds that are becoming more prevalent in Papua New Guinea. The book was written by Biotropica Australia in collaboration with NAQIA to increase public knowledge of invasive plant species and help NAQIA inspection officers to more easily identify weed species coming into the country.



“Papua New Guinea is becoming increasingly concerned about the occurrence, spread and economic impact of weeds on the region’s food and cash crops, as well as the significant threat weeds pose to native forests in many parts of the country. As well as the work being conducted by Papua New Guinean authorities to reduce the occurrence of weeds, EMPNG has weed management programs in place as part of our Environmental Management Plan.”

Laura Ann Dresser
General Manager – Environment and Regulatory Affairs
EMPNG

EMPNG engaged a third party contractor to introduce a cane toad (*Rhinella marina*) control program at the Hides Waste Management Facility during 2017.



Plate 7.7 – Inspecting ponds at the Hides Waste Management Facility for signs of cane toads

The program involves using specialised traps and cane toad removal techniques researched by the University of Sydney, Australia. The monitoring and control of cane toads continues at Moro B Camp and monitoring is being conducted at other Upstream area worksites to evaluate if control measures are required. The introduced cane toad competes for food with some native species and secretes a toxin that can be harmful to humans and animals.

Security restrictions in the Upstream area prevented completion of the 2017 weeds audit. In April, a desktop review was conducted of 10 weeds audits that EMPNG had completed to date, as well as pre-construction surveys for the Lake Kutubu – HGCP Weed Management Zone.

The review concluded that the number of sites where the 14 most significant Priority 1 weeds were observed had considerably reduced in the most recent audits compared to audits conducted during the construction phase. Only three species, *Leucaena leucocephala*, *Mimosa diplotricha* and *Senna alata* were observed at more sites in the tenth weed audit compared to the ninth audit, but the overall trend compared to previous years was down. These results are consistent with predictions in the Environmental Impact Statement.

The weed management contractor uses selective spraying to control Priority 1 weeds. This method focuses on enabling native species to grow and, once established, shade out Priority 1 weeds.

Priority 3 weeds are not controlled because they provide ground cover that prevents Priority 1 and Priority 2 weeds from establishing in exposed ground. In addition to the use of environmentally sound herbicides, weed species are manually removed from waterways and other areas close to village communities.

From a review of the pre-construction survey and a field visit in April, a baseline report has been developed for invasive species monitoring for the Angore Gathering System.

The Angore Gathering System will be added to annual weed audits once construction is finished.

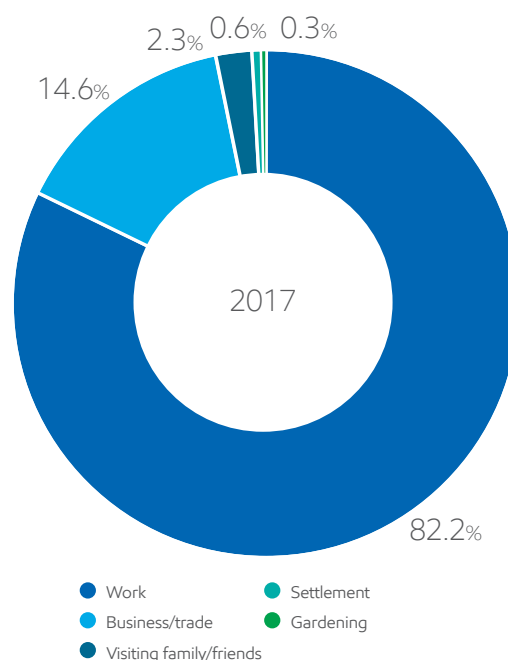
7.5 Access control

An access control system at EMPNG security checkpoints collects data on the number and types of vehicles using EMPNG-controlled roads. Data about reasons for the road use is also collected.

During 2017, 1030 vehicles used EMPNG’s roads primarily for work reasons, as shown in Figure 7.1.

Purpose of access

Figure 7.1 – Percentage of traffic using EMPNG controlled roads by purpose



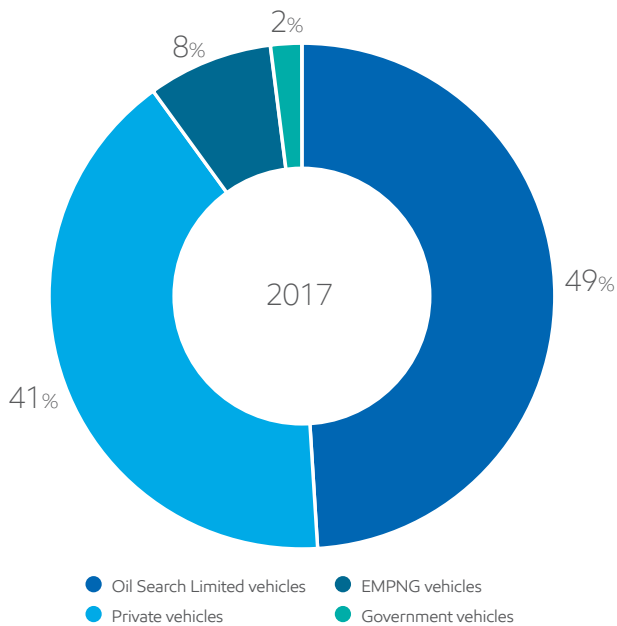
This was a decrease of approximately 700 vehicles compared to 2016 because of security restrictions related to the national election. The type of vehicles entering EMPNG-controlled roads is shown in Figure 7.2.

Monitoring identified tyre tracks on the pipeline ROW between Kilometre Points 14 and 16, and near Kilometre Point 5 during 2017.

Awareness-raising engagements were conducted with local communities to reinforce that vehicles were not permitted to drive along the ROW. Clans involved in Clan ROW Maintenance Agreements were engaged to repair the tyre tracks to prevent ponding and potential gully erosion.

Vehicle types

Figure 7.2 – Percentage using EMPNG access points



One field observation was raised in relation to a community member using his vehicle along the new ROW access track constructed for the Angore Gathering System.

EMPNG engaged with the landowner to help him identify an alternate transport route.

A non-conformance was raised regarding unauthorised vehicular access on the ROW near the LNG Plant.

An EMPNG investigation found that local community members were harvesting mangroves from this area for timber. Awareness-raising engagements were conducted with community members and signage is being arranged for the area boundary to discourage access. Surveillance cameras are also being used along the ROW to monitor access.

A security checkpoint continues to operate at the Hides Wellpad Access Road to manage access to EMPNG's Hides facilities.



Plate 7.8 – Hides Wellpad Access Road leading to Hides Wellpads E and F



EMPNG Operations Technician, Grace Yandi and EMPNG Electrical Technician, Yasi Koriam at the HGCP

8 Performance

EMPNG uses monitoring and evaluation tools including system assessments, site inspections, surveys, sampling and measurement to determine the effectiveness of the ESMP. These tools also enable the company to identify whether mitigation measures designed to manage production risks are achieving their intended outcomes.

8.1 Incidents

EMPNG's incident management system outlines the company's approach to managing incidents, which are defined as situations that have an unintended impact on a person's health, safety, security or livelihood. A situation that impacts property, legal or regulatory compliance or the environment is also classed as an incident. These are classified by Severity Levels of <0, 0, 1, 2, or 3.

Up Close: Contractors share best practice

More than 140 participants from 45 contractor companies attended EMPNG's annual Contractor Safety, Security, Health and Environment Leadership workshop in September. This year's theme was 'Leadership and Barrier Health: Do you have confidence in the barriers and controls to keep your workers safe?'

The workshop included production highlights and an update of EMPNG's safety, security, health and environmental goals, emphasising the company's focus on personal care, risk management and flawless Operations Integrity Management System execution. It reinforced that everyone was considered a risk manager during EMPNG's operations and therefore everybody had a role to play in reducing safety, security, health and environmental risks.

The workshop also educated participants about the use of EMPNG's Major Risk and Barriers Register. The Register is used to communicate major risks and key barriers to the workforce, provide a line of sight between the key barriers and the Operations Integrity Management System and focus resources to where they are needed. Examples of major risks include snakebites and key barriers represent barriers in place to protect workers such as work boots and anti-venom at work locations. Interactive sessions based on real life scenarios were conducted during the workshop so contractors could gain a better understanding of how the Register applied to their scopes of work.

EMPNG Executive Director – Production, Dinesh Sivasambo, said the contractor workshops provided an important forum where EMPNG's contractors could network and share their experiences, which enabled them to work more effectively to deliver best practice in the field.



Contractor Jason Craig from Falck delivers a safety training session to EMPNG Emergency Response Coordinator, Alfred Mamun at the Contractor Safety, Security, Health and Environment Leadership workshop

Severity Level <0 has no significant impact, while Severity Level 2 or 3 require notification to the Lender Group's Independent Environmental and Social Consultant, or relevant government authority.

Incidents and near misses recorded during 2017 are shown according to Severity Level in Figure 8.1.

Incidents

Figure 8.1 – Number by Severity Level for 2017



No Severity Level 1, 2 or 3 incidents were recorded during 2017. Ninety-nine low-level environmental incidents classified Severity Level <0 and 22 near misses were reported during the year in relation to production operations.

Nine Severity Level 0 incidents were recorded, with seven of these in relation to the LNG Plant retention pond mixing pit not meeting discharge criteria. Two Level 0 incidents were raised for elevated faecal coliforms from sampling at the HGCP wastewater treatment plant effluent receiving environment.

EMPNG and its contractors investigated the causes of all incidents and undertook corrective actions.

8.2 Monitoring and evaluation

EMPNG uses ExxonMobil's Operations Integrity Management System to monitor, verify and evaluate its conformance with the ESMP. This enables the company to confirm its mitigation of recognised risks so that intended outcomes can be achieved.

Site-based environmental specialists who inspect worksites, conduct field observations and monitor air, noise and water discharge in accordance with EMPNG's environmental protocols implement the company's verification program.

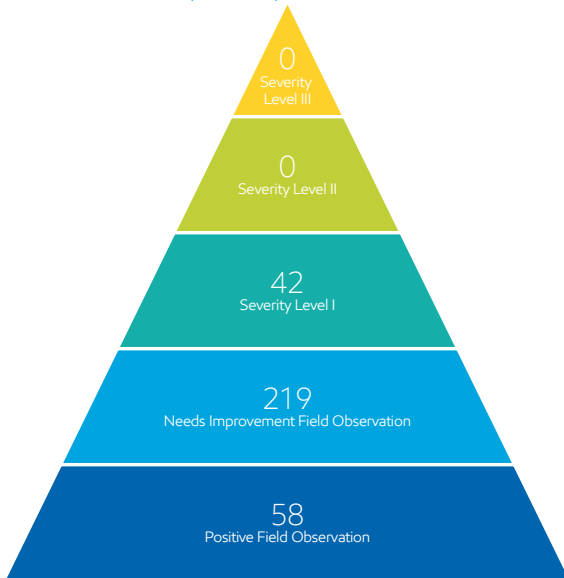
Results

Non-conformances are situations that do not meet ESMP requirements and are classified according to three Severity levels. Severity Level I involves no damage or reasonable expectation of damage progressing through to Severity Level III, which requires corrective action. These Severity Levels align with the incident Severity Levels of <0, 0, 1, 2 and 3.

Field observations and non-conformances identified during 2017 are shown in Figure 8.2.

Non-conformances and field observations

Figure 8.2 - Number by Severity Level for 2017



Forty-two Severity Level I environmental non-conformances were recorded in 2017. One of the non-conformances related to access control on the pipeline ROW.

Nine non-conformances were raised for wastewater discharge effluent quality and 31 were for exceedances of EMPNG's wastewater management criteria. The remaining non-conformance was recorded for an exceedance of air emissions criteria. Thirty-three of the non-conformances were also recorded as Severity Level <0 incidents and nine were recorded as Severity Level 0 incidents. The causes of all non-conformances were investigated and corrective actions taken.

Potential non-conformance situations are reported as 'needs improvement' field observations. They identify an intervention and/or corrective action that is required to prevent a non-conformance.

Of the 219 needs improvement field observations recorded during 2017, 16 related to invasive species management, eight regarded materials management, 17 were for erosion and sediment control, 68 were for waste management, 21 regarded water discharges, 80 were for spill prevention and response management, two were for reinstatement and regeneration, three for access control and four for ecology management.

By the end of December, most needs improvement field observations were addressed and closed, with less than one percent remaining open while teams continued working on corrective actions to close them.



Plate 8.1 – EMPNG Electrical Technician, Yasi Koriem, working at the HGCP

Positive field observations record examples of good environmental practices. Fifty-eight positive field observations were recorded in 2017, with five of these for erosion and sediment control, one for ecology management, one related to reinstatement and regeneration, two related to invasive species, five for materials management, 21 regarding spill prevention and response, 19 for waste management and four related to water discharges.

8.3 External monitoring

The Lender Group's Independent Technical Consultant conducted a monitoring visit of EMPNG facilities in February.

In September, CEPA technical staff visited the LNG Plant marine jetty, waste management facility and retention pond.

The Lender Group's Independent Environmental and Social Consultant completed their annual monitoring visit in October.



Plate 8.2 – Lender Group's Independent Environmental and Social Consultant auditors with EMPNG representatives during the October monitoring visit

The final Independent Environmental and Social Consultant report is available on the PNG LNG website.



Visit the website at
www.pnglng.com



Representatives from women's groups in the Upstream area participating in the Community Livelihood Improvement Project

9 Stakeholder engagement

Engagement and collaboration is maintained with Papua New Guinean communities to keep stakeholders informed about production activities.

9.1 Communities

Since the start of production, EMPNG has conducted almost 30,000 engagements with stakeholders in some 230 communities, including more than 23,000 informal engagements and almost 7000 formal engagements.

EMPNG conducted 2229 formal engagements and 4836 informal engagements in 205 communities during 2017. These engagements involved more than 53,450 attendees.

In the Upstream area, engagements continued with clans involved in Clan ROW Maintenance Agreements. EMPNG also engaged with local communities regarding community development support programs.

In Hides, engagements mainly related to infrastructure maintenance, while training on the new *School Board of Management Training Manual* was conducted with the Hela education division and Tari administration in the Hela Province.

Angore engagements focused on the Angore Gathering System, with communities enquiring about local business development and employment opportunities related to construction works.

In the LNG Plant site villages, engagements focused on community development support activities and community infrastructure projects.



Plate 9.1 – EMPNG Manager – LNG, Jagir Baxi, meeting with Lea Lea Village Local Level Government Councillor, the Honourable Billy Tai

Marine safety awareness sessions were also conducted with LNG Plant site communities in partnership with agencies such as the Papua New Guinea Department of Transport, PNG Ports Corporation, the National Maritime Safety Authority and the Royal Papua New Guinea Constabulary.



Plate 9.2 – A marine safety awareness session at Boera Village

Road safety awareness was conducted with Angore communities and at schools in Hides and the LNG Plant site villages during 2017.

Issues identification

As shown in Figure 9.1, land-related issues accounted for 24 percent of the issues registered during 2017. Most issues regarded land deprivation and compensation payments, for example, cash payments compared to e-banking. Other land issues related to internal clan disputed payments along the pipeline ROW in Gobe.



Plate 9.3 – Bogi Literacy School students learn about road safety at Lea Lea Village

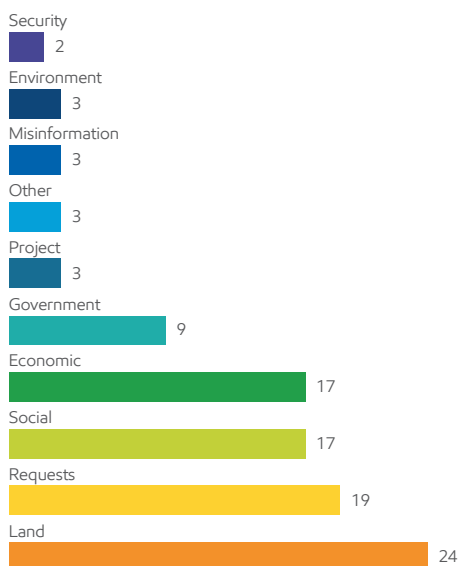
Requests accounted for 19 percent of issues raised. These were largely from schools and community groups seeking community development infrastructure support and community development programs. Local business development support requests were also received, along with requests for support with organising funerals for highly regarded community leaders.

Seventeen percent of issues raised related to economic concerns about local business development in the Upstream area for grass cutting services and the hiring of equipment for quarry materials, particularly in Angore. Other issues regarded the delivery of community development projects and donation requests.

Another 17 percent of issues raised regarded social concerns, particularly in relation to employment in the Upstream area and the recruitment of Village Liaison Officers from the LNG Plant site villages.

Issues

Figure 9.1 – Percentage received by category for 2017



Government-related issues accounted for nine percent of issues raised, with most regarding the payment of royalties from LNG production.

9.2 Government

EMPNG liaises with representatives from all levels of government to keep them informed about production activities. During 2017, EMPNG welcomed new members of Papua New Guinea's parliament following the national election.

9.2.1 Infrastructure and government support

While EMPNG remains committed to providing infrastructure support to the Papua New Guinean Government, this was limited during 2017 because of the national election and formation of the new parliament. EMPNG will recommence its support in 2018 in accordance with the Government's priorities.

9.2.2 Advocacy

In February, EMPNG hosted 17 youths from local Hides communities at the HGCP. The tour included educational sessions on hydrocarbon production and processing and a health talk about malaria prevention.



Plate 9.4 – Youths from Hides communities at the HGCP

In June, the LNG Plant hosted 65 participants from the Kumul GameChangers Initiative as part of their entrepreneurial boot camp program. Kumul GameChangers aims to identify and support the development of an emerging generation of entrepreneurs in Papua New Guinea and the Pacific Islands. Participants from Papua New Guinea, the Solomon Islands, Fiji, Samoa and Tonga attended the boot camp program.



Plate 9.5 – EMPNG Managing Director, Andrew Barry, provides a briefing to new members of Papua New Guinea's national parliament

Following Papua New Guinea's national election, 34 members of the new parliament received a guided tour of the LNG Plant site as part of the Members of Parliament orientation week.

During orientation week, EMPNG hosted an exhibition booth with information about PNG LNG in the National Parliament House grounds.

EMPNG also hosted the Australian Secretary to the Department of the Prime Minister and Cabinet, Dr Martin Parkinson, who was in Papua New Guinea during 2017 to identify AusAID projects.

Four representatives from the Papua New Guinean Department of Energy and Petroleum Exploration also participated in an LNG Plant site tour in 2017.

Up Close: LNG Plant hosts parliamentarians

Olema Uru, from EMPNG's first intake of Operations and Maintenance trainees, presented to 34 newly elected members of Papua New Guinea's national parliament at the LNG Plant site in August.



Operations Process Technician Level 2, Olema Uru, at the LNG Plant presenting to new members of parliament

The visit was held in association with the Chamber of Mines and Petroleum as part of the national parliament's Members of Parliament orientation week.

It included a tour of the LNG Plant, meetings with production personnel and presentations from EMPNG Managing Director, Andrew Barry and General Manager – National Content, Susil Nelson-Kongoi.



"We are very proud of the achievements of our Operations and Maintenance trainees who have shown a strong commitment to their professional development. I personally commend all of our trainees, including Olema Uru, who delivered an inspirational presentation during the parliamentary visit to the LNG Plant site."

Andrew Barry
Managing Director,
EMPNG

9.2.3 Benefits assurance delivery

In September, the first royalty payments of over PGK15 million (US\$4.6 million) were paid to 90 landowner clan accounts in the LNG Plant site area.

The payments were made in accordance with the Umbrella Sharing Agreement between the State and landowners, which provides for the sharing of benefits from LNG production.

The Department of Petroleum and Energy has progressed the second phase of the clan vetting process in the Hela, Southern Highlands and Gulf provinces. The process, which started in 2017 for landowners from the pipeline ROW, will continue in 2018 for landowners from Petroleum Development Licences 1 and 7, to progress towards the Final Ministerial Determination. During this process, the Department is determining how landowner royalties will be split between clans who were identified and approved during phase one of the clan vetting process. Some clans remain involved in mediation through Papua New Guinea's National Court regarding the distribution of benefits from oil and gas production. The Papua New Guinean Government has been funding the mediation process. On completion of the clan vetting process, bank accounts will be opened for identified landowners for the payment of royalties.

Discussions continue between the Government and landowners to agree on setting aside a court injunction regarding the distribution of business and infrastructure development grants, or varying the terms of the order to enable completion of the clan vetting process.

EMPNG continues to make monthly royalty payments from LNG production for distribution to landowners. The funds are managed through a Government-appointed trust account with the Bank of Papua New Guinea.

The Department of Finance is custodian of the account.

EMPNG made its third Development Levy payment to the Papua New Guinean Government during 2017, in accordance with requirements of the *Oil and Gas Act 1998*.

The Development Levy is held in the Department of Petroleum and Energy trust account to be paid to Provincial and Local Level governments for infrastructure development projects in Papua New Guinean communities.

9.2.4 Revenue management

Following publication of the first Papua New Guinea Extractive Industries Transparency Initiative (EITI) Report in 2016 that covered activities in 2013, the second, third and fourth EITI reports covering 2014, 2015 and 2016 activities respectively were released during 2017. These reports are published on the Papua New Guinea EITI National Secretariat website. The National Secretariat has begun preparing Terms of Reference for the 2017 EITI Report, which will be published in 2018.

Papua New Guinea's EITI multi-stakeholder group, of which EMPNG is a member, provided guidance to the Independent Administrator, Ernst & Young, which was appointed by the National Secretariat to draft the EITI reports. The fourth EITI Report, in particular, forms the basis of review and assessment of Papua New Guinea's EITI validation. This Report places greater emphasis on reconciliation of receipts from relevant State Departments and on data and information gaps identified in earlier reports. It includes a case study on the PNG LNG Umbrella Benefit Sharing Agreement, as well as discussions on State Owned Enterprise structure and management.

Overall, the EITI reports have identified the need for a more robust system for managing government revenue payments to minimise vulnerability to fraud, corruption and human error. This problem is further amplified when payments to sub-national governments are taken into consideration. Budgeting for government revenues from the extractive sector is complex due to revenues being subject to fluctuations from a global commodity price and differing tax arrangements and fiscal concessions among the different extractive companies and the Papua New Guinean Government.

In addition to the EITI reports, the National Secretariat has started work on the EITI legislation and policy framework and implemented activities from the Beneficial Ownership Roadmap, which was adopted in January 2016.

The Roadmap aims to develop national priorities that contain a clear link between EITI principles and beneficial ownership disclosure to mitigate the risk of financial misconduct and improve Papua New Guinea's investment climate.

The University of Queensland, Australia also facilitated a three-day Leadership, Data Management and Transparency in the Extractive Sector workshop during 2017 with participants from Papua New Guinean industry and government to raise awareness about the EITI.

EITI is a voluntary initiative that aims to improve governance in resource-rich countries through the disclosure and verification of company payments and government revenues from oil, gas and mining projects. EMPNG is among 21 members of the EITI multi-stakeholder group. ExxonMobil has served continuously on the EITI board as either a full or an alternate member since its inception in 2002.

9.3 Media

During 2017, EMPNG Managing Director, Andrew Barry presented at the inaugural Petroleum and Energy Summit held in Port Moresby, along with ExxonMobil's Asia Pacific Exploration Manager, Andrew Elliott. Mr Barry also spoke at the Papua New Guinea Mining and Petroleum Conference in Port Moresby with Mr Elliott, EMPNG's Medical Advisor, Dr Valentine Kolant and EMPNG General Manager – National Content, Susil Nelson-Kongoi. At the conference, Mr Barry reinforced EMPNG's commitment to Papua New Guinea and the need for stakeholders to work together to create lasting opportunities for the country.



Plate 9.6 – EMPNG Media and Communications Advisor, Patrick Marco and EMPNG Strategic Community Investment Analyst, Evelyn Tau at the EMPNG booth for the 2017 Papua New Guinea Mining and Petroleum Conference

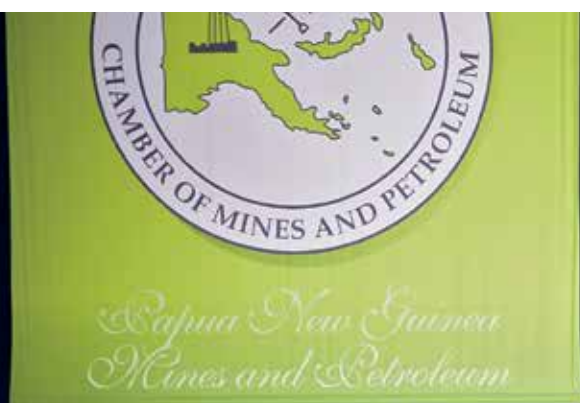


Plate 9.7 – EMPNG Medical Advisor, Dr Valentine Kolant (left) presenting at the Papua New Guinea Mining and Petroleum Conference

Mr Barry also gave presentations to the Australia Papua New Guinea Business Forum in Port Moresby and the PNG Women's Forum in Goroka, as well as the Committee for Economic Development of Australia and the Australia Papua New Guinea Business Council in Brisbane, Australia.



Plate 9.8 – EMPNG Managing Director, Andrew Barry with Lynda Babao-O'Neill, wife of the Prime Minister, at the PNG Women's Forum in Goroka

In partnership with Papua New Guinea's Central Provincial Government, Mr Barry launched the first *School Board of Management Training Manual* for Central Province schools in April.

He also spoke at The Voice Inc.'s Centre for Leadership conference and the Papua New Guinea Olympic Committee meeting during 2017.

The first edition of *ExxonMobil Tok Aut* (previously *PNG LNG TokTok*) was published in Papua New Guinea's daily newspapers early in the year. Another edition was published toward the end of 2017.

ExxonMobil Tok Aut is a newspaper column from EMPNG Managing Director, Andrew Barry, which provides updates about EMPNG's activities and national content initiatives.

Some 20,000 copies and three editions of *PNG LNG TIES* were distributed to stakeholders including EMPNG workers, government, media and local communities during 2017. This eight-page pictorial broadsheet-sized newsletter covers production and business updates as well as stories about PNG LNG's interactions with local communities. *PNG LNG TIES* is published on the PNG LNG website.



Visit the website at
www.pnglng.com

The *PNG LNG Environmental and Social Report – Annual 2016* was published in April. Hard copies of the Report were distributed to almost 150 stakeholders in Papua New Guinea with limited access to the internet. A total 140,000 printed copies of the Report's Executive Summary were published in English and Tok Pisin in national newspapers. The *PNG LNG Environmental and Social Report – Annual 2016*, along with previous Environmental and Social Reports can be found on the PNG LNG website.

Acronyms

Acronym	Definition
AIDS	Acquired Immunodeficiency Syndrome
CEPA	Papua New Guinea Conservation and Environment Protection Authority
EITI	Extractive Industries Transparency Initiative
EMPNG	ExxonMobil PNG Limited
ESMP	Environmental and Social Management Plan
FRED	Field Remote Sensing Environment Data
GWIM	Global Women in Management
HGCP	Hides Gas Conditioning Plant
iHDSS	integrated Health Demographic Surveillance System
Lanco(s)	Landowner company (companies)
LNG	Liquefied Natural Gas
NAQIA	National Agricultural Quarantine and Inspection Authority
PMA	Programmed Monitoring Activity
PNG	Papua New Guinea
ROW	Right of Way
SME	Small and medium-sized enterprises
WMA	Wildlife Management Area
YWCA	Young Women's Christian Association

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Data adjustments may occur after publication and as such, data may be revised in future Reports.

For the purposes of this Report, the currency conversion rate used, between Papua New Guinea Kina (PGK) and United States Dollars (US\$) is 0.3095 [PGK1 = US\$0.3095]. This rate is as published by the Bank of Papua New Guinea at 31 December 2017.



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