

ExxonMobil



# PNG LNG Environmental and Social Report – First Half 2015

*Energy for the World. Opportunity for Papua New Guinea.  
Eneji Bilong Wol. Luksave Bilong Papua Niugini.*



## About this Report

This Papua New Guinea Liquefied Natural Gas (PNG LNG) Environmental and Social Report – First Half 2015 provides information about ExxonMobil PNG Limited’s safety, health, environment and social management progress during production.

It forms part of the PNG LNG Project’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 Project website, [www.pnglng.com](http://www.pnglng.com). Printed copies are also available.

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



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# Executive summary



“Our first year of production demonstrates the successful partnership between EMPNG and the Government and people of Papua New Guinea.”

Andrew Barry, Managing Director, ExxonMobil PNG Limited

ExxonMobil PNG Limited (EMPNG) achieved many milestones in the first half of 2015, including safely completing one year of production on 29 April. This was followed by loading of the 100<sup>th</sup> LNG cargo on 15 June. By the end of June, the amount of LNG delivered reached more than 7.5 million tonnes.

EMPNG is a subsidiary of Exxon Mobil Corporation and manages the production of Papua New Guinea Liquefied Natural Gas (PNG LNG) Project facilities on behalf of its co-venture partners: Oil Search Limited, National Petroleum Company of PNG (Kroton) Limited, Santos Limited, JX Nippon Oil and Gas Exploration Corporation, Mineral Resources Development Company Limited and Petromin PNG Holdings Limited, and their affiliates.

This PNG LNG Environmental and Social Report – First Half 2015, provides a progress update on production activities from 1 January to 30 June 2015.

## Production

EMPNG achieved financial completion of the PNG LNG Project after concluding the 120-day

Lenders Operational Completion Test in January 2015.

In February, the *Papua*, the first of two custom-built EMPNG LNG carriers delivered its first cargo. By the end of June, 104 LNG cargoes were safely loaded for delivery to customers in Asia.

Since EMPNG’s export operations began, an LNG carrier has been loaded, on average, every three or four days with continuous operational excellence.

The Permanent Facilities Compound was nearing completion at the end of June. When completed, it will consist of an administration office, cafeteria and worker facilities such as *haus bungs* or ‘places of gathering’.

EMPNG has signed a Memorandum of Understanding with the Papua New Guinean Government to supply up to 20 million cubic feet a day of domestic natural gas for 20 years for electricity production.

The first supply of electricity from the LNG Plant was delivered on 2 July 2015, in time for the start of the Pacific Games in Papua New Guinea.

**104**  
LNG cargoes  
loaded



Papua New Guinean Prime Minister, the Honourable Peter O'Neill; Petroleum and Energy Minister, the Honourable Nixon Duban; Chairman of PNG Power, Larry Andagali; and other dignitaries witness the first supply of power from the LNG Plant

## Safety, health and security

EMPNG's strong safety performance continued throughout the first half of 2015, now with 700 consecutive days worked without a Lost Time Incident. The company continues to focus on: institutionalising a culture of active caring and safety leadership; understanding hazards and reducing risk tolerance; managing higher risks; and applying lessons learned from other ExxonMobil organisations.

To commemorate World Tuberculosis Day on 24 March and World Malaria Day on 25 April, EMPNG held information sessions across worksites. More than 1000 workers received tuberculosis screening as part of tuberculosis prevention efforts.

Four laboratory technicians completed World Health Organisation recertification for malaria microscopy during the first half. One of the technicians achieved Level I classification – the highest level attainable.

New diagnostic technology has been introduced to enable site clinics to quickly and accurately diagnose common respiratory, gastrointestinal and blood pathogens.

EMPNG's investment in a partnership with the Texas Children's Hospital and the Baylor College of Medicine continues to benefit local communities. More than 390 undergraduate students from the University of Papua New Guinea School of Medicine and Health Science are receiving lectures from two Baylor College of Medicine doctors, who are also supervising 16 medical student research programs. In addition, 42 doctors and nurses at the Port Moresby General Hospital are receiving lectures on current health practices, while another 36 health professionals have received mentoring. Meanwhile, almost 500 children have received

treatment through a comprehensive program that was developed to diagnose, manage and document acute malnutrition in children.

To date, EMPNG has invested PGK8.5 million (USD\$3.1 million) in the Texas Children's Hospital and Baylor College of Health program.

In May, the Lender Group's Independent Environmental and Social Consultant reported that EMPNG was maintaining best practice in its occupational health program.

EMPNG's security teams continue to work closely with Village Liaison Officers to reduce security risks. Royal Papua New Guinea Constabulary personnel also maintain law and order in areas around EMPNG facilities and, like contracted EMPNG security personnel, must complete Voluntary Principles on Security and Human Rights training. In the first half of 2015, five Voluntary Principles on Security and Human Rights training sessions were conducted for Constabulary officers at the Police Training Centre in Port Moresby.

## Environment

EMPNG's Biodiversity Strategy aims to protect biodiversity in the PNG LNG Project area by outlining how terrestrial biodiversity will be managed for the long-term. The Biodiversity Monitoring Plan, focused on EMPNG's Upstream area, defines performance indicators for each objective of the Biodiversity Strategy.

In February, work began on the Biodiversity Surveys element of the Strategy when a team of eight national and international biodiversity specialists spent 30 days surveying 10 sites to confirm selection of three long-term Biodiversity Assessment Areas. One of the Assessment Areas, along the Hides Ridge, represents high altitude ecosystems and contains six monitoring transects. The two other Assessment Areas are near Moro, representing medium altitude ecosystems and consist of four monitoring sites.



Elvis Tamtiai, a researcher with the New Guinea Binatang Research Centre checking for moths from an insect sample

**700**  
consecutive days  
worked without a  
Lost Time Incident

In June, the first Biodiversity Survey was conducted in the long-term Assessment Areas using rapid assessment methodology.

Also during the first half, the New Guinea Binatang Research Centre, a Papua New Guinea-based scientific research organisation that specialises in tropical rainforest research, conducted regeneration monitoring. Early observations show that Right of Way regeneration is progressing well, with a range of desirable forest plant species providing good vegetation cover.

EMPNG continues to implement waste reuse initiatives at its facilities with more than 28 tonnes of scrap metal and 3 tonnes of waste wood sent to a Papua New Guinean recycling facility during the first half of 2015. An additional 30 tonnes of used lead-acid batteries were sent to an approved recycling facility in Lae and more than 42,000 litres of waste oil were sent to another approved facility for reuse.

The company is maintaining its proactive focus on spill prevention, with 55 spill response drills conducted across worksites in the first half. Spill prevention and response was also covered in toolbox talks, site inductions and individual coaching of workers to reinforce the mandatory use of drip trays and absorbent pads on worksites. Regular inspections of spill kits occurred at all worksites.

EMPNG joined community and government volunteers in multiple World Environment Day activities held in the National Capital District, Hela and Central provinces on 5 June. More than 850 people were involved in these activities.



EMPNG workers join volunteers from government agencies, schools and the PNG Hunters football team in support of World Environment Day

## Workforce development

At the end of June, the production workforce, including both EMPNG employees and contractors, reached more than 2600. Of these, over 2100 were Papua New Guinean citizens who comprised 80 percent of the workforce.

More than 65 percent of the production workforce is employed through third party contractors, with 90 percent of the contract workforce being Papua New Guinean.

Since January 2015, more than 23,800 hours of training have been delivered through 1012 courses. Eighty-three percent of the EMPNG employees and contractors trained were Papua New Guinean citizens, of these, 32 percent were women.

The third intake of 40 Operations and Maintenance trainees was selected and began training in April. They are completing nine months of Basic Skills training before commencing the Advanced Skills training program in 2016. The new trainees will also receive on-the-job training, with a focus on personal and team safety procedures, working in a team environment and working with complex equipment for gas and condensate production.

Trainees from the first intake of the Operations and Maintenance training program have qualified as Technician Level 1 workers, while trainees from the second intake are completing their training for Technician level.

EMPNG is sponsoring two engineering students to complete their final year of studies at the University of Technology in Lae. A third student graduated from the University of Technology and has started work as an electrical engineering contractor with EMPNG. All three students were participants in a summer vacation work experience program held at the LNG Plant early this year.

The company is also sponsoring three employees to complete university studies under the ExxonMobil Education Assistance Program.

Three engineers who joined EMPNG's graduate program in December 2014 attended a Production Engineering Overview training course in Melbourne during May. The five-day course covered topics including: exploration and drilling; hydrocarbon properties and behaviour; crude oil processing; and water treatment.

## Supporting Papua New Guinean businesses

EMPNG contracts six Landowner companies (Lancos) to provide services such as labour hire, maintenance, container freighting and vegetable supplies; and another 190 non-Lanco Papua New Guinean businesses for services including transportation of personnel, security, freight and logistics, food supply, medical services and construction material testing.

**23,800+**  
hours spent  
on training

**80%**  
of the production  
workforce is  
Papua New  
Guinean

In the first half of 2015, EMPNG's total in-country spend was more than PGK332 million (USD\$121 million). Of this, more than PGK127 million (USD\$46 million) was spent on Lanco services.

Since the start of production, EMPNG has spent more than PGK664 million (USD\$242 million) on Papua New Guinean services. More than PGK303 million (USD\$110 million) of this was spent with Lancos.

EMPNG sponsored 24 workers from its contractor Laba Holdings Limited to attend the Enterprise Centre's two-day customer service training course in May. The company also sponsored another worker from this Lanco to complete the Centre's Introduction to Supervision training course.

The Enterprise Centre provided business assessments to 58 companies in the first half of 2015, with 44 of these sponsored by EMPNG. The Centre also provided more than 4400 days of training on topics such as human resource management, customer service, bookkeeping/accounting and employee and industrial relations.

More than 340 entrepreneurs were assisted in the first half through information workshops, the use of workstations and business meetings. The Centre has supported more than 17,700 Papua New Guinean entrepreneurs to date.

## Social development

More than 820 students from schools in Port Moresby, LNG Plant site communities and the Upstream area participated in ExxonMobil's Science Ambassador Program in the first half of 2015. The students participated in hands-on lessons about rocks and geology, and oil and gas.



Students from Papa Primary School participating in a practical experiment during a Science Ambassador Program lesson

Construction of a new double classroom and a teacher's house at Tari Secondary School was completed in March.



Hides Gas Conditioning Plant Superintendent, Martin Sagayaraj, officially opening the new buildings constructed for Tari Secondary School

A double classroom and refurbished dormitory at Dauli Teachers College and infrastructure upgrades at Idauwi and Mananda primary schools, were also completed. The construction was funded by EMPNG.

A new community centre and market were opened in Angore in April with funding from EMPNG. The centre was constructed by a Lanco and will provide a meeting place for Angore communities. It includes a water tank for better community access to clean drinking water.

EMPNG sponsored three women to attend a Global Women in Management (GWIM) workshop in Washington DC from 18 May to 12 June. At the workshop the women learned coaching styles, how to strengthen communication skills and how to network effectively to increase the reach and impact of their work.

EMPNG is supporting GWIM alumni with a PGK145,000 (USD\$52,800) donation to the Advancing PNG: Women Leaders Network, an organisation formed by the alumni following the 2014 GWIM conference in Port Moresby.

During the first half of 2015, Ginisegana Solien, an analyst with EMPNG's Public and Government Affairs team, became the first recipient of the Decie Autin Engineering Scholarship for Women. The Scholarship, named after PNG LNG Project Executive, Decie Autin, was launched in 2014 by the Business and Professional Women's Club of Port Moresby. It aims to encourage young Papua New Guinean women to undertake engineering studies.

The landmark 2015 Papua New Guinea Women's Forum held in March brought together many of the nation's most important female leaders and laid the groundwork for ongoing improvements to national policy affecting women.

**PGK332m**  
spent in-country in  
the first half

More than 500 participants attended the three-day Forum, which was hosted by the US Embassy and Papua New Guinea's Department for Community Development. Senior EMPNG female managers were among the participants and the company provided a PGK55,000 (USD\$20,000) contribution to the Forum.

The Forum addressed topics including: women's empowerment and education; leadership; and opportunities for women to participate in business. Recommendations from the Forum will help shape future government policy in Papua New Guinea.

Almost 400 farmers in villages around the LNG Plant site have benefitted from the LNG Plant site food and agriculture program since its inception in mid-2012. Since January 2015, EMPNG has provided more than 2000 fruit tree seedlings and over 430 training and mentoring sessions to farmers regarding crop production and new farming techniques. With the dry season approaching, farmers are being taught the importance of moisture conservation, mulching, and fire management to prevent fruit tree and food crop loss.

In May, an independent third party audit was conducted to assess EMPNG's implementation of its Resettlement Framework. The audit concluded that EMPNG had substantially and materially complied with relevant International Finance Corporation Performance Standards. The auditor confirmed that, providing remaining corrective actions were completed and verified by the Lender Group's Independent Environmental and Social Consultant at their next site visit in October 2015, the current land acquisition, resettlement and Livelihood Restoration Program could be considered complete.

EMPNG is engaging with landowning clans to finalise remaining compensation payments, in accordance with requirements of the *Oil and Gas Act 1998*.

## Stakeholder and community engagement

In the first half of 2015, EMPNG conducted more than 780 formal community engagements in 78 communities and more than 3000 informal engagements in 77 communities, involving almost 20,000 attendees.

In Upstream areas, engagements focused on safety along the pipeline Right of Way, as well as road and traffic safety.

More than 6140 students from 27 primary and elementary schools in Hides, Komo, Angore and Moro participated in an EMPNG 'Always Be Careful' road safety campaign. The campaign consisted of posters featuring Toea from the children's adventure book series. Safety messages were translated into Huli to ensure greater understanding among the students. In communities near the LNG Plant site, more than 2460 students from seven schools participated in road and pedestrian safety awareness programs.



An 'Always Be Careful' road safety campaign session being conducted at Komo Catholic Elementary School

In early 2015, Papua New Guinea's Prime Minister, the Honourable Peter O'Neill, attended the signing of an agreement between EMPNG and the National Airports Corporation to enable commercial flights at Komo Airfield.

The 2015 advocacy program began in February, with Papua New Guinean Department of Petroleum and Energy senior managers receiving a briefing from EMPNG representatives about the status of production activities. By the end of June, more than 95 dignitaries had attended advocacy workshops at the LNG Plant, including Australia's Minister for Trade and Investment, the Honourable Andrew Robb.

EMPNG continues to build on the partnerships formed with the community and government during the construction phase, with the aim of achieving sustainable growth and long-term economic prosperity for the people of Papua New Guinea.

**~20,000**  
attendees at  
community  
engagements



Plate 1.1 – LNG Plant Marine Terminal

# 1 Overview

This PNG LNG Environmental and Social Report – First Half 2015 provides a progress update on production activities from 1 January to 30 June 2015.

ExxonMobil PNG Limited (EMPNG) operates the USD\$18.8 billion Papua New Guinea Liquefied Natural Gas (PNG LNG) Project gas production and processing facilities in the Southern Highlands, Hela, Western, Gulf and Central provinces of Papua New Guinea.

More than 800 kilometres of pipeline connect the facilities, which include a gas conditioning plant in Hides and liquefaction and storage facilities near Port Moresby. These facilities have the capacity to produce approximately 6.9 million tonnes of LNG per year. The location and elements of EMPNG's facilities are shown in Figure 1.1.

Some 250 billion cubic metres of gas are expected to be produced and sold during the life of the facilities. This will provide a long-term supply of LNG to Asia Pacific region customers, including: the China Petroleum and Chemical Corporation (Sinopec); The Tokyo Electric Power Company Inc.; Osaka Gas Company Limited; and CPC Corporation, Taiwan.

Since the start of production in 2014, EMPNG has safely produced more than 7.5 million tonnes of LNG and loaded 104 LNG cargoes for delivery to customers in Asia. Of this, over 3.5 million tonnes of LNG was produced in the first half of 2015.

This Report is published on the PNG LNG Project website, along with the series of quarterly environmental and social reports developed throughout the PNG LNG Project construction phase and during transition to production operations.

Visit the website at  
[www.pnglng.com](http://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 completed one year of production and loaded the 100<sup>th</sup> LNG cargo in the first half of 2015, as described in *Case study: One year of production*. The company also achieved financial completion of the PNG LNG Project after concluding the 120-day Lenders Operational Completion Test in January 2015.

EMPNG has signed a Memorandum of Understanding with the Papua New Guinean Government to supply up to 20 million cubic feet a day of domestic natural gas for 20 years. The first supply of 25 megawatts of electricity from the LNG Plant was delivered on 2 July 2015.



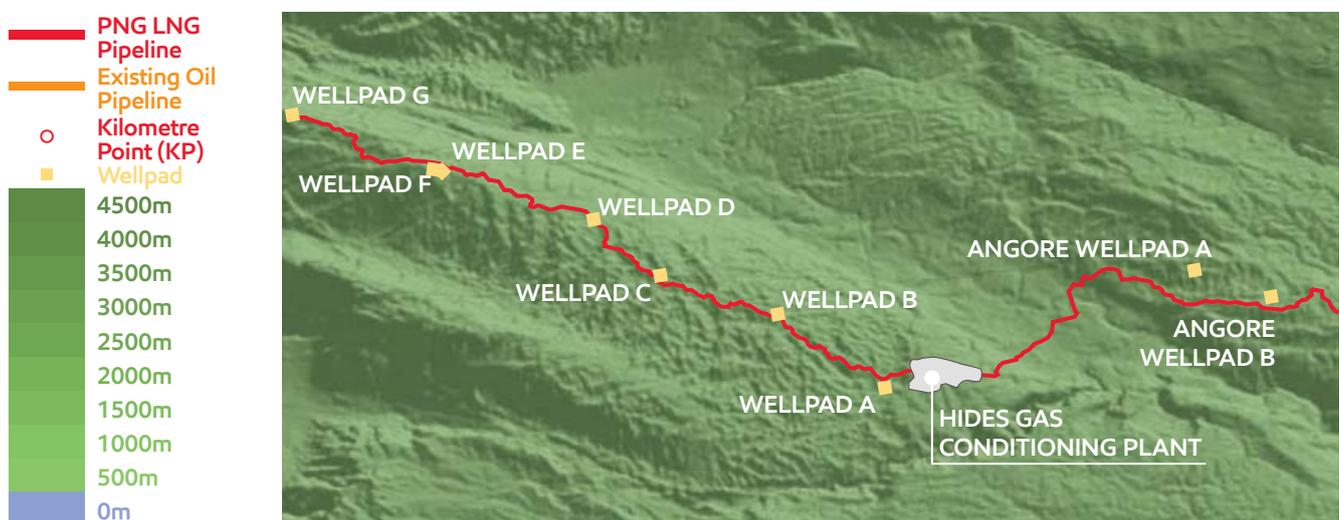
Plate 1.2 – Power substation linking the EMPNG supply into PNG Power's network

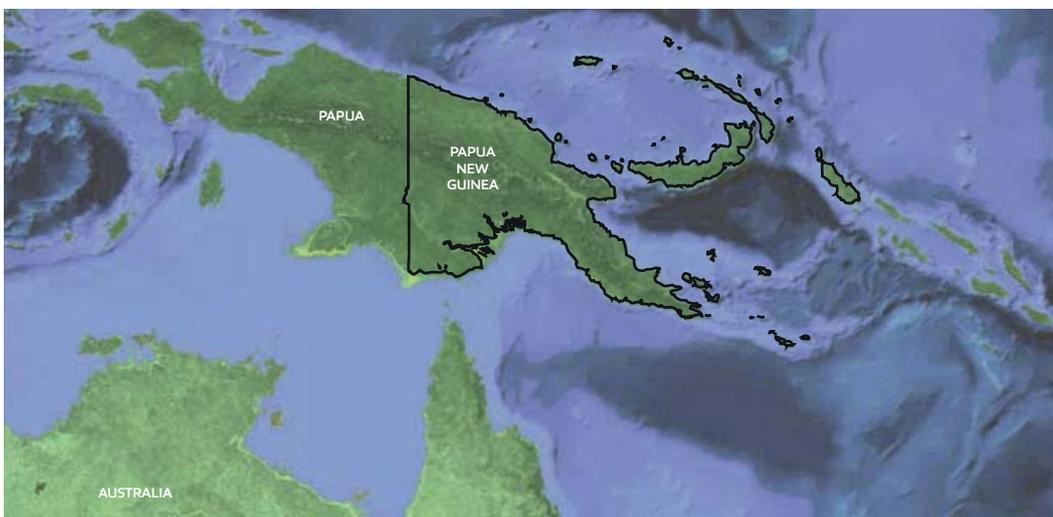
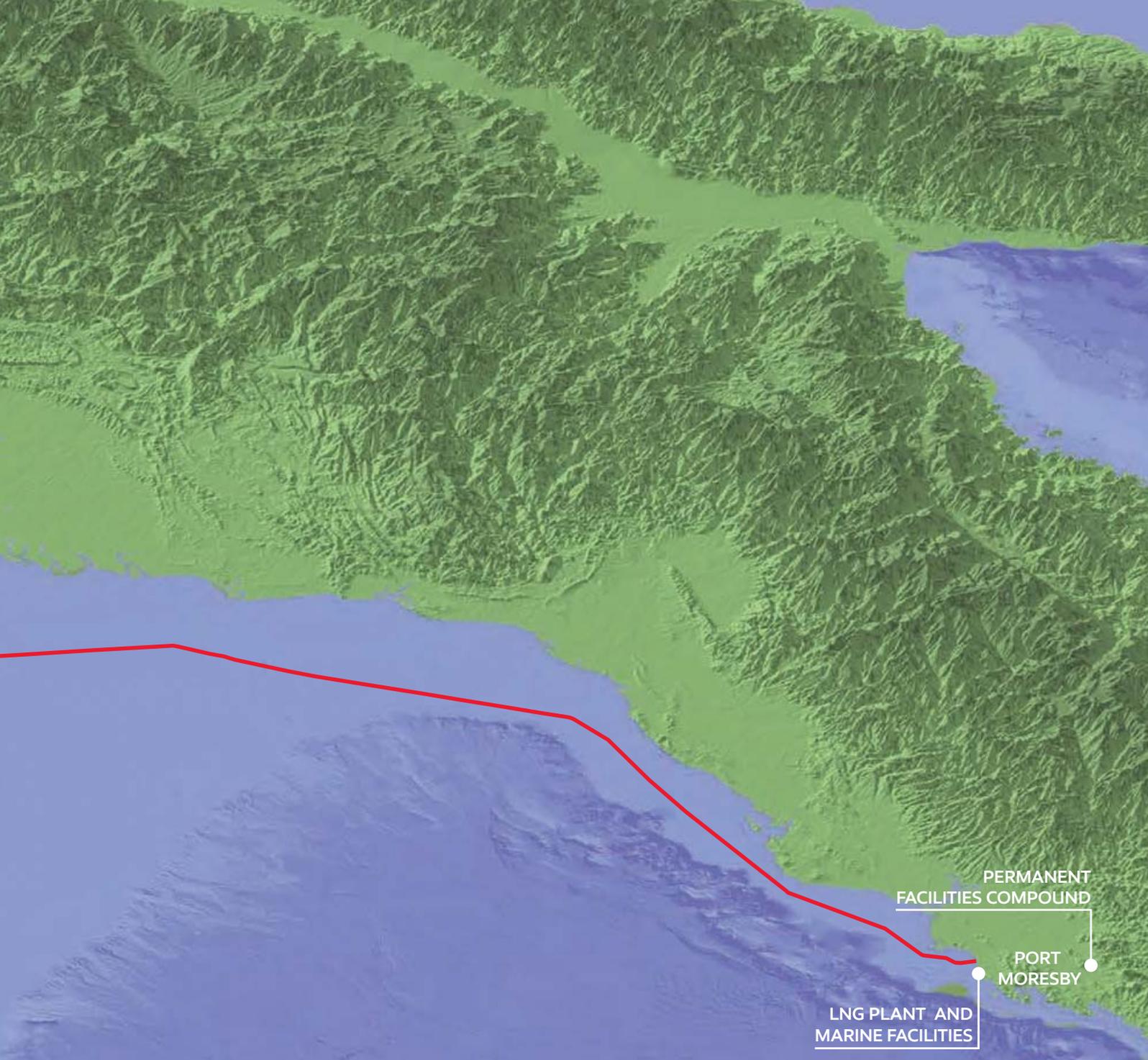
### Hides Gas Conditioning Plant

The Hides Gas Conditioning Plant (HGCP) has achieved steady state operations, with eight production wells on Hides Wellpads B, C, D and G.



Figure 1.1 - EMPNG facilities



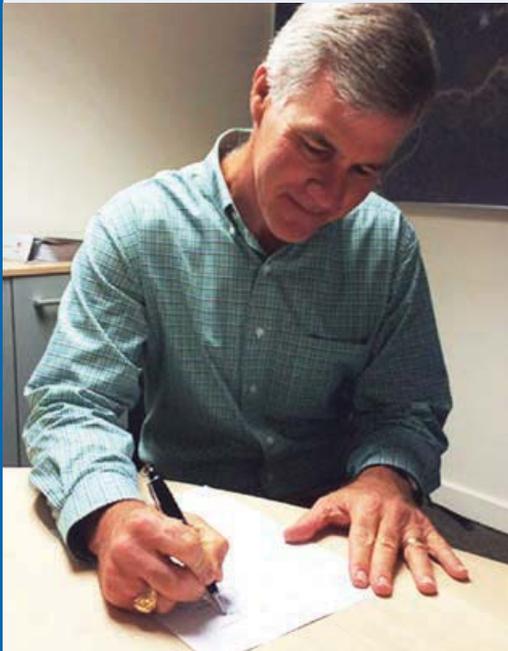




## Project achieves financial completion

In February, the PNG LNG Project achieved financial completion by satisfying all of the completion tests required in its financing arrangements.

Project financing was provided by a consortium of banks and export credit agencies. Achieving financial completion followed the conclusion of the 120-day Lenders Operational Completion Test to demonstrate EMPNG's ability to produce and deliver a reliable LNG supply to customers. EMPNG achieved zero downtime and exceeded the test production volume by 20 percent during the completion test.



EMPNG's Deputy Production Manager, Dale Pittman, signs off on the Lenders Operational Completion Test report

Stable operations have also been achieved from associated gas facilities through the Kopi gas pipeline and condensate pipeline that links the HGCP and Kutubu Central Processing Facility. Purchased gas from the South East Gobe field began flowing via the Gobe Production Facility in mid-2015.

### Drilling

Drilling Rig 702 began drilling operations on the Angore Wellpad A well during the first half of 2015. Drilling Rig 703 completed drilling operations on Hides Wellpad F and rig demobilisation commenced.

Perforation activities concluded on both Hides Wellpad G wells and the wells were commissioned for production.

### LNG Plant

The LNG Plant is receiving a steady supply of gas from the HGCP and associated gas facilities, and fuel and flare rates remain stable. The LNG Plant's compressor inspection program was completed in April.

An electrical substation was installed and commissioned at the LNG Plant to supply the Port Moresby energy grid as part of the Memorandum of Understanding signed with the Papua New Guinean Government. Electricity is provided by the existing surplus generating capacity from two gas turbine units at the LNG Plant. The first power export to the energy grid commenced ahead of the Pacific Games held in Port Moresby in July 2015.

### Marine facilities

The *Papua*, the first of two custom-built EMPNG ships, completed its first delivery of cargo in February. By the end of June, 104 LNG cargoes were safely loaded for delivery to customers in Asia.



Plate 1.3 – LNG carrier *Methane Spirit* transported the 100<sup>th</sup> cargo bound for Japan

### Permanent Facilities Compound

Construction of the Permanent Facilities Compound, located in Port Moresby, is on schedule for completion in July 2015. More than three million work hours were achieved by the end of June without a Lost Time Incident.

The on-site workforce has reduced from 600 workers to 100, with many workers demobilising as construction activities are completed.

Upon completion, the Permanent Facilities Compound will consist of an administration office, cafeteria and worker facilities, such as a space for *haus bungs* meaning 'places of gathering'.

# Case study

## One year of production

On 29 April, EMPNG completed one year of production. In June, the company loaded the 100<sup>th</sup> LNG cargo.

By the end of June, the amount of LNG delivered to customers in Asia reached more than 7.5 million tonnes.

EMPNG Managing Director, Andrew Barry, said the completion of the first year of production has demonstrated to the world what Papua New Guinea is capable of delivering.

“Since completing the PNG LNG Project ahead of schedule and shipping the first cargo of LNG on 25 May 2014, our facilities have been operating above expectations,” Mr Barry said.

“It has been a truly remarkable first year of full production, in which our safety focus remains high, with seven million production hours completed without a lost time injury.”



The *Spirit of Hela* completed EMPNG's first LNG cargo delivery on 2 June 2014

Mr Barry said many thousands of people had contributed to the development of EMPNG. More than 191 million work hours were involved in the construction of the company's facilities and over 21,000 people were employed at the peak of construction.

By the end of June, more than 2600 people were engaged in production-related roles, of these, 80 percent were Papua New Guinean citizens.

“We look forward to many more decades working with the people of Papua New Guinea to deliver a lasting legacy for this country,” Mr Barry said.

### 100<sup>th</sup> LNG cargo loaded

Just over one year from commencing production, EMPNG loaded its 100<sup>th</sup> LNG cargo for delivery to The Tokyo Electric Power Company Inc. in Japan, the same customer who received the first cargo on 2 June 2014. The 100<sup>th</sup> cargo was loaded on 15 June on LNG carrier *Methane Spirit*.

Since EMPNG's export operations began, an LNG carrier has been loaded, on average, every three or four days with continuous operational excellence.

### First custom-built LNG carrier

The *Papua*, the first custom-built LNG carrier for EMPNG, arrived at the LNG Plant Marine Terminal on 22 February to begin loading its first cargo. The 172,000-cubic metre, 290-metre-long LNG carrier is the largest of its kind ever built in China.

The *Papua* is the third LNG carrier on long-term lease to EMPNG.



The *Papua* docked at the LNG Plant Marine Terminal

Two other carriers, the *Spirit of Hela* and *Gigira Laitebo*, entered EMPNG's service in 2014.

These vessels are named after the Hela Province, where the gas originates; and in honour of Mount Gigira, a sacred site in the Highlands.



Plate 2.1 – View of the HGCP at night

# 2 Environmental and social framework

EMPNG protects the wellbeing of its workers, local communities and the environment surrounding production facilities through implementation of the Production ESMP.

## 2.1 Approach

EMPNG operates in accordance with the Production Environmental and Social Management Plan (ESMP), which applies lessons learned from the construction phase, along with Exxon Mobil Corporation's Operations Integrity Management System requirements and the International Finance Corporation Performance Standards.

Two Environmental Management Plans and seven Social Management Plans, are contained within the ESMP, 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.

Requirements of the ESMP and its supporting management plans apply throughout normal operating conditions and in reasonably foreseeable abnormal operating conditions or emergency situations.

In collaboration with stakeholders, EMPNG will periodically update the ESMP to meet ongoing operational needs and the needs of Papua New Guinea's environment.

The ESMP is published on the PNG LNG Project website.

Visit the website at [www.pnglng.com](http://www.pnglng.com)



## 2.2 Management of Change

EMPNG uses a Management of Change process to manage temporary or permanent modifications to facilities and changes to previously approved documents. Before any proposed change can be made, requirements are considered for health, safety, security, environmental and social management, operability and maintenance, regulatory, cost and scheduling. 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 Environmental and Social Report.

No Class I or II changes were raised during the first six months of 2015.

Figure 2.1 - Production Environmental and Social Management Plan structure





Plate 3.1 – Local entrepreneurs with their certificate of participation after successfully completing Human Resource Management training

# 3 Procurement and supply

Local suppliers are used for production-related activities wherever possible. EMPNG also supports the Enterprise Centre, which delivers capacity building programs and provides business reviews to help develop Landowner companies and other Papua New Guinean businesses.

## 3.1 Supplier development

EMPNG contracts six Landowner companies (Lancos) and another 190 non-Lanco Papua New Guinean businesses for production-related services.

Lancos provide services such as labour hire, maintenance, fuel distribution, transportation, container freighting and vegetable supplies.



Plate 3.2 – Laba Holdings Limited, a Representative Lanco for the LNG Plant site, provides transportation, security, camp and catering services to EMPNG

Non-Lanco Papua New Guinean businesses are used for transportation of personnel, security, freight and logistics, food supply, customs clearance, maintenance supplies, surveying, medical services and construction material testing.

In the first half of 2015, EMPNG's total in-country spend on third party services was more than PGK332 million (USD\$121 million). Of this, more than PGK127 million (USD\$46 million) was spent on Lanco services.

Since the start of production, EMPNG has spent more than PGK664 million (USD\$242 million) on Papua New Guinean services. More than PGK303 million (USD\$110 million) of this was spent with Lancos.

## 3.2 Enterprise Centre

EMPNG and other organisations continue to support the Enterprise Centre in building sustainable operations. For example, in May, EMPNG sponsored 24 workers from its contractor Laba Holdings Limited to attend the Centre's two-day customer service training course.

EMPNG also sponsored another worker from this Lanco to complete the Enterprise Centre's Introduction to Supervision training course.



Plate 3.3 – Laba Holdings Limited workers with their certificates following the completion of customer service training

In addition to these courses, the Centre provided project management training for Papua New Guinean Department of Defence workers and delivered accounting software training to Lancos. The Enterprise Centre assessed 58 companies in the first half of 2015. Of those, 44 were sponsored by EMPNG as part of the company's commitment to developing local businesses. Seven of the 44 companies were Lancos.



Plate 3.4 – Project Management training participants from the Department of Defence



Plate 3.5 – Safety in the Workplace training program participants with their completion certificates

The Enterprise Centre has completed 378 business assessments since it was established in 2010. It has also delivered more than 16,600 training days and 1200 advisory and mentoring days to Papua New Guinean businesses.

More than 4400 days of training have been provided since January 2015, with 500 of them delivered to Lancos and female-owned Papua New Guinean businesses. Most of the training covered human resource management, customer service, bookkeeping/accounting and employee and industrial relations.



Plate 3.6 – Lanco representatives with their accounting software training certificates



Plate 3.7 – Human Resource Management training at the Enterprise Centre

More than 340 entrepreneurs were also assisted through information workshops, the use of workstations and business meetings.

The Enterprise Centre has supported more than 17,700 Papua New Guinean entrepreneurs to date.

### 3.2.1 PNG Employment and Supplier Database

The PNG Employment and Supplier Database was offline during the first half of the year for technical upgrades to make it more robust and user-friendly. The improved database was being tested at the end of June to determine when it could go back into service.



Plate 4.1 – EMPNG workers join volunteers from government agencies, schools and the PNG Hunters football team in activities supporting World Environment Day

# 4 Communities

In partnership with local communities, non-government organisations and government agencies, EMPNG is helping to deliver sustainable development programs that are intended to build the capacity of communities and community-based organisations.

## 4.1 Community investment

EMPNG's Community Development Support Management Plan and community investment programs provide investments that support sustainable community development in Papua New Guinea, with the aim of enhancing economic empowerment.

Education, health, women's economic opportunity and agriculture are focus areas within the Plan.

The company's community development support activities are coordinated under two geographic areas:

- Project area programs – These are planned activities implemented near production facilities in the Upstream area, Pipeline Right of Way (ROW) and LNG Plant site.
- National programs – This covers EMPNG's support for national initiatives and Port Moresby projects.

### 4.1.1 Project area programs

EMPNG is providing support for infrastructure and education initiatives in schools and local communities through its Project area programs. These programs work to build sustainable capacity in communities surrounding production facilities.

#### Upstream area

Construction of a new double classroom and a teacher's house at Tari Secondary School was completed in March. A double classroom and refurbished dormitory at Dauli Teachers College and infrastructure upgrades at Idauwi and Mananda primary schools, were also completed. The construction was funded by EMPNG.

The company also funded the construction of a staff house at Baguale Primary School and classrooms at Inu and Omati elementary schools, which were nearing completion in June.



Plate 4.2 – Dauli Teachers College Principal, Dali Tinol, receives keys to a new double classroom from HGCP Superintendent, Ken Rhyason

A new community centre and market were opened in Angore in April with funding from EMPNG. The centre was constructed by a Lanco and will provide a meeting place for Angore communities. It includes a water tank for better community access to clean drinking water.

In April, EMPNG workers conducted maintenance works on a solar system and repairs to the health centre radio antenna at Benaria Station in the Hela Province.

As part of the Community Livelihood Project, implemented by the Australian National University, 52 women in the Upstream area received basic bookkeeping training and business mentoring. The women, who have small businesses in the PNG LNG Project area, gained new skills in recording income and expenditure,

and with simple calculations on profit and loss, enabling better business planning and budgeting. The Community Livelihood Project also includes agricultural and baking programs.



Plate 4.3 – Participants at a basic bookkeeping training session

### Pipeline Right of Way

More than 30 women from the Homa-Paua Women’s Group completed sewing training in March. The training, funded by EMPNG, was conducted through the Chamber of Mines Women in Mining and Petroleum Program. This Program aims to develop women’s skills so they can proactively engage in income-generating activities. The training was held at the Homa Women’s Centre, which the PNG LNG Project built in 2013.



Plate 4.4 – Sewing training conducted at Paua Village through the Chamber of Mines Women in Mining and Petroleum Program

On 15 March, EMPNG workers and contractors attended the National *Haus Krai* event held at Pimaga Station in the Southern Highlands Province. The National *Haus Krai* is an annual day of mourning in Papua New Guinea to recognise the suffering of women through physical and sexual violence. The Nipa-Kutubu District Women’s Council organised the event. EMPNG also held a similar event at the HGCP for workers and contractors. These events aimed to raise awareness about violence against women through presentations, toolbox talks and posters.



Plate 4.5 – National *Haus Krai* event held at Pimaga Station

### LNG Plant site

Almost 400 farmers in villages around the LNG Plant site have benefitted from the LNG Plant site food and agriculture program since its inception in mid-2012.

Since January 2015, EMPNG has provided more than 2000 fruit tree seedlings and over 430 training and mentoring sessions to farmers regarding crop production and new farming techniques. With the dry season approaching, farmers are being taught the importance of moisture conservation, mulching, and fire management to prevent fruit tree and food crop loss.



Plate 4.6 – LNG Plant Agriculture Technical Assistant, Michael Atuai, demonstrates how to plant African yams to local communities



Plate 4.7 – Board of Management workshop participants

A five-day workshop was held in May for School Board of Management members from four primary schools in LNG Plant site communities. The 20 Board members who participated included head teachers, senior community members and parents.

Workshop outcomes included the first draft of a School Board of Management training manual, which is intended to increase the effectiveness of governance in schools and provide education leadership to the schools and surrounding communities.

The workshop was facilitated by Department of Central Provincial Education Division representatives, Enterprise Centre trainers, EMPNG representatives and an education specialist.

EMPNG provided sponsorship and trophies for an inter-school sports carnival on 12 June involving Papa and Lea Lea primary schools. More than 400 students and their parents and teachers, as well as EMPNG representatives, attended the carnival.

#### 4.1.2 National programs

As part of its commitment to maintaining and preserving biodiversity in Papua New Guinea, EMPNG has funded more than PGK2.6 million (USD\$947,700) for a research and community engagement project to protect the *Piku* or 'pig-nosed turtle (*Carettochelys insculpta*)'.



Plate 4.8 – Students proudly displaying their EMPNG-donated trophies awarded at the Papa and Lea Lea primary inter-school carnival



Plate 4.9 – More than 400 students, their parents and teachers attended the Papa and Lea Lea primary inter-school carnival on 12 June

The *Piku's* meat and eggs are highly prized in Papua New Guinean communities, with almost 90 percent of the eggs laid annually harvested and adult females hunted. Initiated in 2012 through a partnership with the University of Canberra, the *Piku* Project involves working closely with communities on research and education about this threatened species. The Project also includes funding of a research scholarship for a Papua New Guinean masters student.

In the first half of 2015, a three-day environmental education workshop was conducted with 15 teachers from schools that had received *Piku* education books.

The workshop provided teachers with knowledge about how to use the books to educate students about the importance of biodiversity and conservation.

During the workshop, a teacher's guide was developed, which included lesson plans teachers could use in classrooms.

To date 15,000 copies of *Piku*-themed books have been distributed to 14 schools near EMPNG facilities.

### Education and training

During the first half, more than 160 tertiary students undertook a leadership development program provided through a partnership between The Voice Inc. (TVI) and EMPNG.

TVI is a non-profit organisation, formed by University of Papua New Guinea students, that runs a leadership training program targeted at schools and universities.

In June, EMPNG's National Content Manager, Susil Nelson-Kongoi and Community Development Support Manager, Sisa Kini, presented at a TVI mentoring program event and shared their career experiences with more than 100 female students.

Both the Papua New Guinean Government and EMPNG support the Clean Generation Program, another TVI initiative.

This Program is designed to inspire and encourage young Papua New Guineans on their contribution as citizens and leaders for the nation.

As part of the Program, the Government has created communication platforms through radio and magazines for young people to express their opinions on the nation's future.

By the end of June, more than 6000 students and their teachers had participated in the Port Moresby Nature Park School Excursion Program. This Program, which started in 2013, enables students to see Papua New Guinea's unique biodiversity up close. EMPNG has contributed more than PGK215,000 (USD\$78,300) to the Program to date and provided additional funding and support to the Nature Park for its educational and community activities.



Plate 4.10 – Port Moresby International School Grade 7 students study three different types of rocks during a Science Ambassador Program lesson about rocks and geology



Plate 4.11 – Children participating in school holiday events at the Port Moresby Nature Park as part of the Park’s School Excursion Program

### Science Ambassador Program

More than 820 students participated in ExxonMobil’s Science Ambassador Program in the first half of 2015.

In Port Moresby, Grade 7, 8 and 10 classes from Ela Murray International, Gordons International and Port Moresby International schools participated in sessions about rocks and geology. Grade 8 classes from Papa, Lea Lea, Boera and Porebada primary schools in the LNG Plant area also participated in rocks and geology education sessions.

In the Upstream area, Grade 6, 7 and 8 students from Para, Mananda, Komo, Tiute, Juni, Idauwi, Tugupawi and Kukupalu primary schools received education about rocks and geology, and oil and gas.

The lessons gave students practical, hands-on experience and included science-related experiments, as well as information about careers in science, technology, engineering and mathematics.

### Community health

EMPNG’s investment in a partnership with the Texas Children’s Hospital and the Baylor College of Medicine continues to benefit local communities. More than 390 undergraduate students from the University of Papua New Guinea School of Medicine and Health Science are receiving lectures from two Baylor College of Medicine doctors, who are also supervising 16 medical student research programs.

In addition, 42 doctors and nurses at the Port Moresby General Hospital are receiving lectures on current health practices, while another 36 health professionals have received mentoring.

As part of this program, an Australian obstetrician has been funded to support maternal health in Papua New Guinea.

More than 100 people participated in a Papua New Guinea Cancer Foundation cancer awareness program, consisting of six public awareness sessions held throughout the country, with the first of these conducted in Alotau at the end of April.

### Up close



## Investing in child health

EMPNG has continued its funding for the Texas Children’s Hospital and Baylor College of Medicine partnership with a further investment of PGK2.4 million (USD\$892,000). This brings the total invested to PGK8.5 million (USD\$3.1 million) to date.

EMPNG has invested in a partnership with the Texas Children’s Hospital and its partner, the Baylor College of Medicine, along with Papua New Guinea’s National Department of Health and the University of Papua New Guinea School of Medicine and Health Sciences, to improve public health capacity in child and maternal health. The partnership is funding two Baylor College of Medicine doctors and an Australian obstetrician to support maternal and child health care programs in Papua New Guinea. The doctors are involved in activities such as supporting health education at the University of Papua New Guinea School of Medicine and Health Sciences, supporting paediatric child health programs and providing education and clinical and public health support, in collaboration with the National Department of Health, to hospitals such as Port Moresby General Hospital.

By the end of June, the doctors had delivered more than 120 lectures and over 530 mentoring hours to medical students at the University of Papua New Guinea. In addition, almost 500 children had received treatment through a comprehensive program that was developed to diagnose, manage and document acute malnutrition in children.



Dr Edwin Machine, Baylor College of Medicine, providing a lecture to medical students

EMPNG has provided PGK72,000 (USD\$26,200) to support the work of the Foundation in reducing cancer rates in Papua New Guinea.

Formed in 2014 through a partnership between Papua New Guinea's Department of Health and the Cancer Council Australia, the Papua New Guinea Cancer Foundation aims to coordinate cancer services throughout the country.

In June, EMPNG donated six automated external defibrillators and 58 first aid kits to the Pacific Games Organising Committee. The defibrillators serve a critical function in ensuring a patient's stability in cardiac emergencies. After the Pacific Games, the defibrillators and first aid kits will be provided to public health clinics and the Port Moresby General Hospital.

### Volunteers

More than 902 hours were dedicated to seven volunteer activities in the first half of 2015.

To support World Environment Day, 110 EMPNG volunteers joined schools, community groups and government agencies in clean-up, environmental awareness and tree planting activities at Ela Beach in Port Moresby, Papa Primary school near the LNG Plant site and Para Primary school in Hides.

In addition to World Environment Day activities, three clean-ups were conducted in Port Moresby, one in Hides and another at the Komo market.

In March, 40 EMPNG volunteers dedicated time on the weekend to assist in moving soil for a new children's playground and planting trees at the Port Moresby Nature Park.



Plate 4.12 – EMPNG volunteers at the Port Moresby Nature Park

Another 10 EMPNG volunteers supported preparations for the Business and Professional Women's Club's International Women's Day Breakfast held in Port Moresby in March, as detailed in *Case study: Making it happen for women*.

The Sir Anthony Siaguru Walk Against Corruption is a national fundraising and awareness raising event hosted by Transparency International Papua



Plate 4.13 – EMPNG supports the Business and Professional Women's Club – Dale Pittman, EMPNG Deputy Production Manager (centre back), with Club executives and EMPNG representatives

New Guinea Inc., with walks held this year in Port Moresby, Lae, Kokopo, Kimbe, Kavieng and Lihir. In Port Moresby alone, the event attracted more than 3000 participants.



Plate 4.14 – EMPNG volunteers participating in the Sir Anthony Siaguru Walk Against Corruption in Port Moresby

Twenty-four EMPNG representatives and two EMPNG-sponsored school groups joined the walk on 14 June. This year's theme was "Our Country, Our Games. Let's run a straight race".

## 4.2 Community grievance management

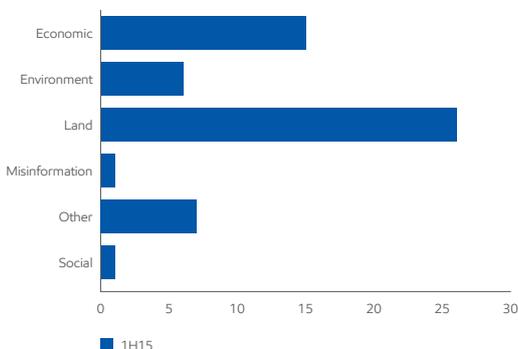
EMPNG registered and categorised 49 grievances during the first half. By the end of June, 55 grievances were closed, with one grievance remaining open and under investigation.

Eighty-seven percent of grievances raised in the first half were closed in less than 30 days.

Figure 4.1 shows active grievances during the first half, including seven grievances carried over from the fourth quarter 2014.

Figure 4.1 - Active grievances

Number by category



Land-related concerns accounted for the highest number of grievances, covering 46 percent of the total recorded. These grievances regarded speculative claims for property improvements, gardens and crops and claims for compensation.

Three of the land-related grievances were resolved, with the remainder confirmed as non-genuine claims.

Economic grievances accounted for 27 percent of the total grievances. Most of these regarded a delay in the supply of crops to eight farmers through the LNG Plant food and agricultural program. One grievance involved a water tank that could not be installed because of a community disagreement about where it should be located.

All of these grievances were resolved and closed within the first half of the year.

Grievances categorised as 'other' represented 12 percent of concerns raised. Many of these were about dogs hit by EMPNG vehicles. The company paid compensation to these grievants and reinforced safe driving messages with EMPNG and contractor drivers. Some disputes from people seeking payment for employment with third party contractors were also registered in the 'other' category. EMPNG contacted the contractors involved to progress the closure of these grievances.



Plate 4.15 – A grievant in Hides signs a closure form with EMPNG Community Affairs Officer, Simon Marka and Village Liaison Officer, James Tandupi

Environment-related grievances represented 11 percent of grievances recorded. Most claims regarded plant damage that was alleged to be associated with production activities. These claims were investigated, with most found to be non-genuine.

One grievance was raised about drainage at the Permanent Facilities Compound. This was addressed with the site construction team lowering a construction grill in a creek to enable better water flow.

# Case study

## Making it happen for women

The 2015 International Women's Day theme of 'Make it Happen' is becoming a reality for many women located near production facilities, thanks to EMPNG's support of programs for Papua New Guinean women.

As well as providing work opportunities for more than 500 women at production facilities, EMPNG is investing in training and development programs targeted at women in local communities.

For example, EMPNG is supporting women with fulfilling their leadership potential through a PGK145,000 (USD\$52,800) donation to the Advancing PNG: Women Leaders Network.

The Network consists of alumni from the ExxonMobil-supported Centre for Development and Population Activities Global Women in Management (GWIM) program. Since 2006, EMPNG has enabled 52 women to attend the program in Indonesia, Washington DC and the first GWIM conference held in Papua New Guinea in 2014.

Following the 2014 Port Moresby conference, the GWIM alumni decided to set up the Network as a secretariat to ensure they continued to support each other and share ideas to progressively influence positive change in Papua New Guinea. The nation's First Lady, Lynda Babao O'Neill, is patron of the secretariat.



EMPNG Managing Director, Andrew Barry with participants of the Advancing PNG: Women's Leadership Network and Papua New Guinea's First Lady, Lynda Babao O'Neill (far right)

EMPNG funding will help the Advancing PNG: Women Leaders Network to develop their organisational capacity in areas such as staffing, finalising their strategic plan and developing and implementing programs to support their members.

### Up close



### A day for women

International Women's Day events were held across EMPNG facilities in March to recognise the important role that women play in their communities.

Based on the theme 'Make it Happen' events included a Meri blouse day and panel discussions about gender-based violence.



HGCP employees celebrate International Women's Day on 8 March

### Landmark Women's Forum

The landmark 2015 Papua New Guinea Women's Forum in March brought together many of the nation's female leaders and laid the groundwork for ongoing improvements to national policy affecting women.

More than 500 participants attended the three-day Forum, which was hosted by the US Embassy and Papua New Guinea's Department for Community Development. Senior EMPNG female managers were among participants and the company provided a PGK55,000 (USD\$20,000) contribution to the Forum. The Forum addressed topics including: women's empowerment and education; leadership; and opportunities for women to participate in business.

# Case study

## Making it happen for women

Major national issues were also addressed including: Papua New Guinea's progress with implementing international conventions on women; breaking down barriers in education for girls; women's rights under the *Family Protection Act 2013*; and combatting sexual violence against children. Keynote speakers included: Dame Meg Taylor, Secretary General of the Pacific Islands Forum Secretariat; and Admiral Cari Thomas, U.S. Coast Guard. Recommendations from the Forum will help shape future government policy in Papua New Guinea.

### Women join GWIM program

EMPNG sponsored three women to attend a GWIM workshop in Washington DC from 18 May to 12 June.

Dianne Kambanei, Executive Director of Young Women's Christian Association; Doreka Gari Dai, member of the Boera Women's Association; and Janet Mbuda, Deputy Head Teacher of Mananda Primary School in Komo were selected to attend the workshop based on their contributions to Papua New Guinean communities. At the workshop the women learned coaching styles, how to strengthen communication skills and how to network effectively to increase the reach and impact of their work.

"My commitment is to ensure my staff and members in my organisation are well equipped with the information and skills that I gain from this training," said Dianne Kambanei.

"The workshop gives us the opportunity to exchange ideas, skills, experiences, knowledge and success stories with other women leaders to enable us to make a positive difference at home in our communities," said Doreka Gari Dai.



Janet Mbuda during a group discussion with a fellow participant at the GWIM workshop in Washington DC

Janet Mbuda said she was looking forward to bringing what she had learned back to her community and encouraging other women to participate in projects that they were passionate about.

The GWIM program is supported by the ExxonMobil Women's Economic Opportunity Initiative, which is a global effort launched in 2005 to help women in developing countries fulfil their economic potential and serve as drivers of economic and social change in their communities.

### Scholarship for women

Ginisegana Solien, an analyst with EMPNG's Public and Government Affairs team, has become the first recipient of the Decie Autin Engineering Scholarship for Women.



Ginisegana Solien is the first recipient of the Decie Autin Engineering Scholarship

The engineering scholarship will enable Gini to return to the University of Technology in Lae to complete the Civil Engineering Degree she started nine years ago.

"I am looking to encourage, inspire and empower other women in my village and to motivate them to improve their lives through an awareness of education and opportunities that are available to them," Gini said.

By the end of June, six women had received the Decie Autin Engineering Scholarship, which was launched in 2014 by the Business and Professional Women's Club of Port Moresby. The Scholarship aims to encourage young Papua New Guinean women to undertake engineering studies and is named after PNG LNG Project Executive, Decie Autin.

Since 2012, EMPNG has provided PGK187,000 (USD\$31,711) of funding for Business and Professional Women's Club scholarships.



Plate 5.1 – Hariki Ikila, a Hela community member, inspects a maize crop in his new garden

# 5 Compensation and resettlement

EMPNG has completed the land acquisition and resettlement process for construction of the PNG LNG Project and is engaging with landowning clans to finalise compensation payments in accordance with the *Oil and Gas Act 1998*.

## 5.1 Compensation

In the first half of 2015, four Clan Agency Agreements were signed and nine compensation payments made to landowning clans along approximately 4 kilometres of the onshore pipeline ROW between Homa and the Dagia River, and for one access road in Kopi.

Compensation has been completed for 93 percent of the onshore pipeline ROW. EMPNG is maintaining engagement with the remaining clans, which are in dispute regarding land ownership.

Once disputes are resolved, EMPNG will complete the compensation process.

The company has also completed more than 70 percent of 2015 annual deprivation payments.

## 5.2 Resettlement

EMPNG has conducted an evaluation of the standard of living and livelihood restoration outcomes of all physically and economically displaced households to determine whether pre-resettlement conditions were maintained, improved or declined.

The standard of living evaluation incorporated information gained during the resettlement process and from site surveys, while the livelihood restoration evaluation consisted of three field surveys and a food garden adequacy survey analysis.

The Lender Group's Independent Environmental and Social Consultant (IESC) verified EMPNG's outcome results for a sample of resettled households, while an independent third party audit was conducted in May to assess EMPNG's implementation of its Resettlement Framework.



Plate 5.2 – Tatara Women's group member Frinda Yorobi demonstrating how women use cassava to make flour for baking

The independent audit aimed to determine whether the PNG LNG Project's resettlement process could be considered complete in terms of the International Finance Corporation's Performance Standards on Social and Environmental Sustainability.

The third party audit included site meetings and interviews with 30 randomly selected households that had been physically or economically displaced as a result of the construction of EMPNG facilities.

Some of the topics covered during the audit were: resettlement and livelihood restoration planning and implementation; the census and asset survey; eligibility for compensation; and the extent to which the standard of living and/or livelihoods of physically and economically displaced households had been maintained or improved.

The auditor found that EMPNG had made considerable effort to avoid and minimise displacement of households through means such as re-routing of some parts of the onshore pipeline.

When displacement was necessary, the Project worked closely with communities in accordance with international best practice and in compliance with the laws of Papua New Guinea.

The auditor also found that EMPNG's social baseline surveys, census and asset surveys, Resettlement Action Plans and Community Resource Plans used to identify impacted communities, households and individuals had been generally comprehensive.

For example, the PNG LNG Project team worked with affected people to prepare Resettlement Action Plans for areas where physical or economic displacement occurred.

Each of these Plans was geographically specific and implemented in a manner consistent with Papua New Guinean legislation, company

policy, the International Finance Corporation's Performance Standards on Social and Environmental Sustainability and other relevant international standards.

The audit showed that, of 366 households physically displaced through construction activities, the standard of living was either maintained or improved for 353 resettled households, with 12 households unable to be contacted during the audit.

The one household that reported a decline in standard of living was related to access to water, with EMPNG addressing this concern.

EMPNG's internal evaluation of economically displaced households, through its food garden monitoring program and the IESC verification, found that, from 211 identified households, livelihoods were either maintained or improved for 208 households.

EMPNG is continuing its agricultural program to help increase the productivity and income of the three households that had reported a decline in their economic situation after resettlement.

Ongoing monitoring will continue through the company's Community Development Support Program. This includes reviewing access to water for some resettled communities and providing additional livelihood restoration support programs where needed.



Plate 5.3 – A household water tank provided by EMPNG to a community member in Juni



Plate 5.4 – Resettlement auditor Ted Pollett interviewing a woman from a resettled household, with translation assistance from EMPNG employee Mary Alebago

Based on audit results and EMPNG’s internal evaluations, the independent audit concluded that EMPNG had substantially and materially complied with International Finance Corporation *Performance Standard 5 Land Acquisition and Involuntary Resettlement* and relevant sections of *Performance Standard 7 Indigenous Peoples*.

The auditor confirmed that, providing remaining corrective actions were completed and verified by the IESC at their next site visit in October 2015, the current land acquisition, resettlement and Livelihood Restoration Program could be considered complete.



Plate 6.1 – Elsie Digwaleu, one of the Operations and Maintenance trainees to achieve Operations Technician Level 1, working at the LNG Plant

# 6 Workforce

EMPNG provides training programs and accreditation opportunities to develop the skills of the production workforce and build the technical capacity of Papua New Guinean citizens.

## 6.1 Workforce composition

At the end of June, the production workforce, including both EMPNG employees and contractors, reached more than 2600. Of these, more than 2100 were Papua New Guinean who comprised 80 percent of the workforce.

More than 65 percent of the production workforce is employed through third party contractors, with 90 percent of the contract workforce being Papua New Guinean.

## 6.2 Workforce training

As part of EMPNG's commitment to building the skills and knowledge of Papua New Guinean workers, ongoing workforce training is provided through a combination of in-house training and externally delivered courses. While EMPNG provides training for its employees, contractors also offer workforce training relevant to their scopes of work.

Since January 2015, more than 23,800 hours of training have been delivered through 1012 courses. Eighty-three percent of EMPNG employees and contractors trained were Papua New Guinean citizens, of these, 32 percent were women.

### 6.2.1 Employee training

Approximately 11,000 hours of training was provided to 652 EMPNG employees through 856 courses conducted during the first half of 2015. Since the start of production, EMPNG employees have received more than 37,000 hours of training. Courses delivered in the first half focused on developing the technical skills of the production workforce, including building the capacity of graduate engineers and Operations and Maintenance trainees.

Up close



## Zillar bridges cultures at EMPNG

Zillar Miro, from Madang Province, is part of the team responsible for coordinating EMPNG employee training and managing the company's Learning Management System.

Zillar has extensive experience with providing appropriate training to businesses and tertiary institutions and her role with EMPNG includes ensuring the correct employee training roadmap is created on the System. She also produces training reports for stakeholders, such as the Papua New Guinean Government.

"Working with EMPNG has enabled me to broaden my knowledge in managing a Learning Management System and gain further experience in cross-cultural training," Zillar said.

"It is great to see positive results from the training program we have put in place," she said.



Zillar Miro, EMPNG Training Analyst

The training covered topics such as occupational health and safety and how to safely operate processing plants and maintain equipment used to process gas.

Cultural awareness has also been highlighted to workers in 152 site inductions. Cultural awareness training is provided to all workers, as outlined in *Case study: A lesson in culture*.

Supervisors receive specialist cultural awareness training. Twenty-five supervisor cultural awareness training sessions have been conducted this year at the LNG Plant and HGCP.

### Engineering

EMPNG is sponsoring two engineering students, Stephanie Manoi and Francis Sakato, to complete their final year of studies at the University of Technology in Lae. Both Stephanie and Francis participated in a summer vacation work experience program at the LNG Plant early this year. A third student who participated in the work experience program, Immaculate Wanjik, graduated from the University of Technology and has started work as an electrical engineering contractor with EMPNG.

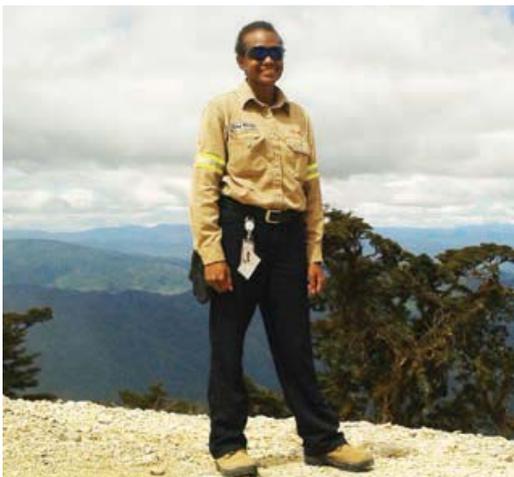


Plate 6.2 – Immaculate Wanjik on the Hides Spine road after completing an equipment inventory in Hides

EMPNG is also sponsoring three employees to complete university studies under the ExxonMobil Education Assistance Program. Programmatic Engineering Technician, Nerolyn Verave, is studying Chemical Engineering and Facilities Surveillance Engineering Technician, Joe Arthur, is studying Mechanical Engineering, both at Charles Darwin University, Australia; while Public and Government Affairs Operations Analyst, Belinda Gurra, is completing a Chemical Engineering degree at the University of Southern Queensland, Australia.

Three engineers who joined EMPNG's graduate program in December 2014 attended a

Production Engineering Overview training course in Melbourne during May. The five-day course covered topics including: exploration and drilling; hydrocarbon properties and behaviour; well completion procedures; oil and gas separation equipment; crude oil processing; and water treatment. EMPNG is recruiting applicants for its 2016 graduate program intake, with applications closing at the end of July 2015.

### Operations and Maintenance

The third intake of 40 Operations and Maintenance trainees was selected and began their training in April. They are completing nine months of Basic Skills training before commencing the Advanced Skills training program in 2016.

#### Up close



### EMPNG welcomes new trainees

Another 40 young Papua New Guineans have joined EMPNG as part of the third intake of Operations and Maintenance trainees.

The new trainees began their coursework in April. The learning involves completing foundation skills and basic skills training in oil and gas before moving to facility-specific training.

Trainee Barbara Kipak said it had been her dream to work for EMPNG. "I feel proud to have been selected for this program. I know there will be a lot of work and learning, but I'm looking forward to it," she said.

The first intake of 59 Operations and Maintenance trainees commenced in 2010 followed by a second intake of 74 trainees in 2012. Once the third intake of trainees completes their training, they will join previous graduates who are currently employed at facilities, including the HGCP and LNG Plant, along with associated pipelines and wells.



Barbara Kipak (centre) with her parents at the welcoming ceremony for the third intake of Operations and Maintenance trainees

# Case study

## A lesson in culture

Among its 7.6 million people, Papua New Guinea has more than 800 languages, with tribal identities and traditions being fundamental to the fabric of life.

Many tribes live in communities near PNG LNG Project facilities and a high number of production workers identify with tribal links in their communities.

The people in the Hides area are known as the Huli. Near Kutubu, it is the Foe, Fasu and Onabasulu. Near Gobe it is the Sau people, and in the Gulf it is the Kerowo, Omati, Mena and Ikobe-Kasere tribes. The Motuan and Koitabuan tribes reside in Caution Bay.



Papua New Guinea has a rich cultural diversity consisting of more than 200 different cultural groups, each with their own traditions, customs and traditional dress. For a *sing-sing*, a 'gathering of tribes or villages where they show off their distinct cultures', tribal groups spend hours preparing their spectacular costumes. The colours and patterns of face paint indicate the wearer's tribe and place of origin

In Papua New Guinea, the key to building a work environment of respect and mutual understanding is helping employees understand different cultures in the workplace. Therefore, as part of EMPNG's induction process, workers are provided

with mandatory cultural awareness training. Supervisors receive additional specialised cultural training.

Cultural awareness sessions are delivered through both classroom training and self-study. The sessions cover topics such as:

- understanding the Motuan and Koitabuan cultures and working with the Huli
- understanding cross-cultural differences, including value systems
- enabling effective cross-cultural communication in the workplace
- Papua New Guinean traditions including bride price, ceremonies, death, land ownership and the wantok system.



Huli men performing the *Mali* dance. Their attire consists of: a long woven apron; a short apron with dangling pig tails; a hornbill and pig teeth necklace worn on the back of the neck; a nasal septum shaft; woven arm and leg bands; a black belt; a hair wig adorned with plumes of the cassowary, cockatoo and bird of paradise; a *hago* belt worn around their torso; and a unique face paint design using primarily yellow with highlights red, white and blue

This training aims to help workers explore the beliefs, perceptions and attitudes that enable people to connect with others.

It helps participants develop an awareness, understanding and appreciation of the skills, attitudes and beliefs that are needed to work effectively in Papua New Guinea.

The new trainees will also receive on-the-job training, with a focus on personal and team safety procedures, working in a team environment and working with complex equipment for gas and condensate production.

Trainees from the first intake of the Operations and Maintenance training program have qualified as Technician Level 1 workers, while trainees from the second intake are completing their training for Technician level. To achieve Technician Level 1, the trainees must demonstrate a high quality of work, as well as initiative and the ability to self-monitor. The trainees must also demonstrate teamwork and competency at the worksite, strong planning and organisational skills and high levels of safety, health and environmental awareness.

### 6.2.2 Contractor training

Since January 2015, contractors have provided approximately 12,800 hours of training relevant to their scopes of work. Training was delivered to almost 3000 participants through 156 courses. Almost 90 percent of training participants were Papua New Guineans.

In the first half, course topics included work site safety expectations, food safety, working at heights, safe driving, manual handling, hazard identification and risk control, electrical safety and hearing protection.

## 6.3 Workforce health

EMPNG implements workforce health programs, oversees contractor health services delivery and conducts performance monitoring and reporting across the primary health management areas of medical, public health and industrial hygiene.

In May, the IESC reported that EMPNG was maintaining best practice in its occupational health program. This is being achieved through monthly occupational health program performance reviews that cover the effectiveness of: clinical, environmental health and industrial hygiene program implementation; and team health and safety program performance. The performance reviews also identify continuous improvement opportunities in EMPNG's primary health management areas.

### Medical

Clinical operations, including pathology and medical emergency response, are maintaining high standards of performance across all EMPNG worksites.

Early this year clinical staff completed blood-borne pathogen training and a risk mitigation review of clinical tasks, emphasising the

prevention of injuries caused by sharp instruments such as needles.

Four pathology laboratory technicians have completed World Health Organisation recertification for malaria microscopy. One of the technicians achieved Level I classification – the highest level attainable. The other three technicians achieved Level II classification. New pathology diagnostic technology has been introduced to enable site clinics to quickly and accurately diagnose common respiratory, gastrointestinal and blood pathogens. The new equipment is improving infectious disease diagnosis and outcomes for patients.

A new computerised simulation mannequin, called SimMan®, has also been introduced to provide realistic training scenarios for clinical staff and to enhance their health care decision making skills. The first training programs involving SimMan® were conducted at HGCP and LNG Plant clinics in May. The training covered procedures such as intravenous cannula insertion, Cardio Pulmonary Resuscitation and airway suctioning.

The clinical service provider continues to deliver weekly toolbox talks to raise worker health awareness. For example, in May more than 2600 workers attended health awareness sessions that covered topics including: immunisations and vaccine preventable disease; recommended vaccinations for Papua New Guinea; vaccine schedules; and exercise and obesity risks. Weekly health topics have been scheduled to correspond with global health campaigns, such as World Tuberculosis Day and World Malaria Day.

### Public health

EMPNG conducts monthly health assessments of camp hygiene and sanitation, food and potable water safety, vector surveillance and control and infectious disease outbreak.

Assessments conducted during the first half of 2015 showed that EMPNG and its contractors and service providers are meeting camp health standards and effectively implementing program improvements.

Camp cleaning procedures have been reviewed to ensure effective disinfectant chemicals are available and used at camp clinics, kitchens, dining halls and accommodation areas.

The review is helping to standardise sanitation practices and raise awareness among cleaners about infection control to reduce the spread of pathogens in camps. As a result of the review, rates of gastroenteritis reported by camp residents have decreased.

On World Malaria Day, toolbox talks and information sessions were provided to workers to raise awareness about vector-borne illnesses. The sessions included information about mosquito breeding areas, bite prevention and symptoms of mosquito-borne illnesses. EMPNG provided mosquito bed nets for workers to reduce their risk of contracting malaria. Regularly scheduled vector surveillance activities, including daily mosquito trapping and larva site treatment, were also completed.

At the LNG Plant, an emergency response drill simulating a norovirus outbreak was completed as part of the Infectious Disease Outbreak Management program. Site management, clinical staff, cleaning and catering supervision workers participated in the desktop exercise, which focused on early identification and response.

### Industrial hygiene

Noise and air monitoring is conducted across worksites to assess potential worker exposure to noise and air contaminants.

Air monitoring is undertaken during condensate loading and maintenance activities to confirm that appropriate personal protective equipment (including respiratory protection) is worn during these tasks.

Results from exposure monitoring surveys are reviewed with workers during toolbox meetings. For example, the hearing conservation program was recently discussed to review the requirement for hearing protection, such as earplugs and earmuffs, in high noise areas.

Industrial hygiene site assessments completed during the first half of 2015 included benzene safety, hazardous materials management, noise and hearing conservation, respiratory protection, the heat stress prevention program and maintenance activities such as welding. Results of these assessments show that EMPNG is meeting its industrial hygiene program requirements.

### Other strategic initiatives

EMPNG held information sessions and activities across worksites to commemorate World Tuberculosis Day on 24 March and World Malaria Day on 25 April.

On World Malaria Day, EMPNG's mosquito mascot, Mr Buzz, distributed informative brochures about malaria prevention to workers in Port Moresby.

For World Tuberculosis Day, EMPNG educated workers about the company's free annual tuberculosis screening, which consists of a single blood test and completion of a tuberculosis health questionnaire.



Plate 6.3 – Mr Buzz handing out brochures to staff at the Port Moresby office in support of World Malaria Day

Workers are provided with their test results within a few days. More than 1000 workers participated in tuberculosis screening as part of the company's tuberculosis prevention efforts.

## 6.4 Workforce safety

EMPNG's strong 2014 safety performance has continued throughout the first half of 2015.

By the end of June, 700 consecutive days had been worked without a Lost Time Incident and 100 work days were completed without a recordable incident. Drilling Rig 703 achieved 546 consecutive days without a recordable incident by the end of June. Overall, the Drilling organisation achieved 241 days without a recordable incident.

This year's EMPNG Safety Focus Areas include: institutionalising a culture of active caring and safety leadership; understanding hazards and reducing risk tolerance; managing higher risks; and applying lessons learned from other ExxonMobil organisations.

Key activities conducted during the first half of 2015 included the:

- Safe Start campaign – This campaign emphasised EMPNG's Safety Focus Areas and what was expected from management and the workforce to achieve the company's vision of 'Nobody Gets Hurt'. It included the delivery of presentations from senior managers directly to workers to reinforce the message that safety is a core value in EMPNG. Nine sessions were held and involved participation from all EMPNG employees and contractors.
- Culture of Active Caring campaign – Almost 21,000 Observation and Interaction cards have been submitted since the beginning of 2015.



Plate 6.4 – One of the many daily safety toolbox talks held at EMPNG facilities

This campaign encourages every worker to observe how their colleagues work and engage in discussions about safe behaviours and opportunities for improvement.

- Third Contractor Safety, Security, Health and Environment Leadership workshop – More than 100 people from some 15 different companies who perform contract services for EMPNG attended the workshop in Port Moresby. The workshop theme of ‘Empowering the First Line Supervisor’ focused on methods that enable first line supervisors to establish a ‘No Hurt’/‘I Care’ safety culture. A key breakout session was held to improve how people learn from others’ incidents and experiences. Participants were also provided with additional training on EMPNG’s ESMP.



Plate 6.6 – Participants at the third Contractor Safety, Security, Health and Environment Leadership workshop



Plate 6.5 – EMPNG Managing Director, Andrew Barry, presenting at the third Contractor Safety, Security, Health and Environment Leadership workshop

### 6.4.1 Leading and lagging indicators

Leading and lagging indicators are used to measure the effectiveness of EMPNG’s safety system. Proactive incident prevention is measured through leading indicators, while lagging indicators are used to measure actual incidents and their consequences.

Observations and Interactions, Hazard Identification and Near Miss Reports are core EMPNG processes used for proactive incident prevention.

During the first half of 2015, the level of participation in Observations and Interactions significantly increased. This is an indication of the success of the Culture of Active Caring campaign.

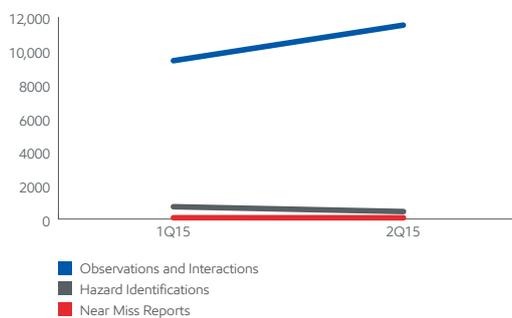
The Hazard Identification process decreased and the number of Near Miss Reports remained consistent, as shown in Figure 6.1, due to decreased construction activity.

EMPNG worksites achieved a combined 5 million work hours without a Lost Time Incident in the first half of 2015. Since July 2013, more than 53 million work hours have been completed without a Lost Time Incident.

EMPNG's ongoing commitment to high safety performance standards has enabled the company to maintain a current 365-day moving average of 0.18 for the Total Recordable Incident Rate and 0.00 for the Lost Time Incident Rate.

**Figure 6.1 - Core safety process reporting**

1H15 numbers by quarter



## 6.5 Security

EMPNG's security teams continue to work closely with Village Liaison Officers to reduce security risks. The company also has a written memorandum of understanding with the Royal Papua New Guinea Constabulary for EMPNG to provide limited funding via strict protocols for security in areas around production facilities.

All Government security personnel subject to those protocols, and all private security personnel contracted to EMPNG, must complete Voluntary Principles on Security and Human Rights training. In the first half of 2015, Constabulary officers took part in five Voluntary Principles on Security and Human Rights training sessions at the Police Training Centre in Port Moresby. During the sessions, participants received the International Committee of the Red Cross booklet *Police Conduct and Behaviour – International Human Rights Law and Humanitarian Principles for Professional Policing*.

## 6.6 Worker welfare and conditions

High standards of worker welfare and conditions are maintained during production through the ongoing implementation of EMPNG's Labour and Working Conditions Management Plan.

### 6.6.1 Camps

EMPNG is committed to providing well-maintained, clean and secure accommodation facilities for its workers, as outlined in *Case study: Camps deliver best practice*.

As part of this commitment, refurbishment works continued on camp amenities for the production workforce in the first half of 2015.

At the LNG Plant, works involved improvements to pathways, camp roads and drainage. Upgrade works were also undertaken on a camp accommodation block.

At the HGCP, work continues on landscaping and site beautification.



Security measures have been upgraded in female accommodation areas at both worker camps and weekly inspections are conducted of potable water systems to ensure a clean water supply at the camps.

Recreational facilities have also been enhanced, with upgraded media and entertainment rooms and religious facilities.

Camp newsletters remain an important means of keeping residents informed of events, camp policies and initiatives. Camp committees and comment cards enable workers to give their feedback about camp facilities so that ongoing improvements can be made. Through these feedback mechanisms, most workers have rated EMPNG's camp facilities and services as above average.

### 6.6.2 Labour and working conditions

EMPNG is committed to ensuring that all new and existing employees observe the highest standards of integrity in business conduct and operate in an atmosphere of mutual trust and respect. New employees are briefed on the company's Standards of Business Conduct as part of their induction program.

Existing workers receive periodic refresher training on these standards, covering topics such as: ethics; conflicts of interest; the use of corporate assets; anti-corruption; customer relations; alcohol and drug use; equal employment opportunity; harassment in the workplace; and health, safety and environment.

Equally important are the company's procedures and its open door communication policy, which outline the process for employees to ask questions, voice concerns and make appropriate suggestions regarding the company's business practices.

As part of its commitment to maintaining high workplace standards, Exxon Mobil Corporation has launched a Global Diversity webpage, which is accessible through the company's corporate home page. The new webpage supports ExxonMobil's Global Diversity Framework that aims to:

- attract, develop and retain a premier workforce, from the broadest possible pool, to meet our business needs worldwide
- actively foster a productive work environment where individual and cultural differences are respected and valued, and where all employees are encouraged to contribute fully to the achievement of superior business results

- identify and develop leadership capabilities to excel in a variety of international and cultural environments.

The Framework aligns with EMPNG's culture-by-design initiative, *Em pasin bilong ExxonMobil long PNG*, which translates to 'the way we work at ExxonMobil in PNG'.



Plate 6.8 – EMPNG workers participate in *Em pasin bilong ExxonMobil long PNG* training at Moro B Camp

The culture-by-design initiative was introduced to Upstream facilities and the LNG Plant, and relaunched at EMPNG's head office in Port Moresby, in the first half of 2015. The initiative is based on the core values and behaviours that EMPNG desires in its workforce.

The values of security, respect for the environment, excellence, teamwork and integrity are intended to drive a corporate culture that cares about the work the company does, the way the work is conducted and the wellbeing of the workforce.

To support the wellbeing of EMPNG employees, and as part of a caring workplace culture, the company provides a free 24-hour confidential counselling service. The service, called the Workplace Assistance Program, is designed to help workers and their immediate families with work or personal problems. The Program is delivered by a team of psychologists and counsellors based in Papua New Guinea and Australia who provide support with problems such as work/family balance, parenting, family or interpersonal conflicts, stress and depression, financial concerns and alcohol or drug misuse. The Program is provided through both face-to-face and telephone counselling.

# Case study

## Camps deliver best practice

EMPNG's operations often require workers to stay on-site during their rotation to ensure the company safely meets production schedules. As such, EMPNG provides camp facilities that comply with best practice standards for its workforce.

In accordance with commitments made in the ESMP, the company provides workers with well-maintained, clean and secure facilities that comply with International Finance Corporation performance standards and Exxon Mobil Corporation's own Operations Integrity Management System. Exxon Mobil Corporation's Global Operations Best Practices also guide the operation of camps. For example, requirements and expectations related to camp management and catering include, but are not limited to: personnel qualification criteria; food specifications and best practice food safety; health and hygiene standards. These best practice standards mean that workers are provided with clean, secure accommodation and have on-site access to high quality health, dining, commissary and recreational facilities that cater for diverse cultural needs. For example, HGCP and LNG Plant camps provide prayer rooms to accommodate different religious needs and dining facilities offer menu selections for specialist dietary requirements. Days of cross-cultural significance are celebrated across all worker camps.

Social interaction is enabled through regular activities, such as band nights, sporting tournaments and music nights. Gymnasium and sporting equipment is also provided for camp residents.

EMPNG maintains high camp standards through rules, regulations and a code of conduct that is communicated with workers as part of their induction process. Workers are also provided with information about the camp grievance mechanism and procedures to lodge any complaints regarding food, dining, house-keeping or maintenance concerns. HGCP and LNG Plant Camp Committees have been established to proactively identify and address camp residents' concerns. These Committees also play an important role in communicating activities and updates to camp residents through regular camp newsletters, announcements and noticeboards.



Camp dining rooms cater for special dietary requirements



Gymnasium facilities at the HGCP Camp



Chinese New Year is recognised through Chinese-themed menus and displays



Plate 7.1 – The Soro River, the only outlet of Lake Kutubu, Southern Highlands Province

# 7 Environmental management

EMPNG has management and monitoring procedures in place to reduce the potential impact of production activities on the surrounding environment.

## 7.1 Air

Stack testing is conducted at EMPNG facilities to verify that equipment performance meets air emissions criteria outlined in the company's environmental management plans.

At the HGCP, air emissions sources include compressor gas turbine exhausts, main power generator exhausts and diesel generators, while at the Hides Waste Management Facility the main source is an industrial waste incinerator. At the LNG Plant, sources of air emissions include compressor gas turbine exhausts, main power generator exhausts, regeneration gas furnace exhausts, hot oil system furnace exhausts and a high temperature incinerator used to burn waste.

Stack testing was conducted at the HGCP in February and again in April at the LNG Plant, HGCP and the Hides Waste Management Facility. All readings were within permitted limits – with the exception of one power generator reading at the HGCP in February, which was slightly above permitted levels. A low-level incident of Severity Level <0 (as defined in *Section 9.1 Incidents*) was recorded and addressed with the aim of optimising generator performance.

Subsequent testing in April showed all emissions to be within permitted limits. EMPNG recorded a further five low-level incidents of light hydrocarbon vapour releases to air during the first half of 2015.

Production facilities continue to be monitored to identify and address any unplanned vapour releases to air.

In May, EMPNG notified the Department of Petroleum and Energy when a malfunction of the mono-ethyl-glycol vapour incinerator at the HGCP caused it to be off-line for four days.

A Severity Level 0 incident was raised, the malfunction was investigated and system procedures were reviewed to capture learnings from the incident.

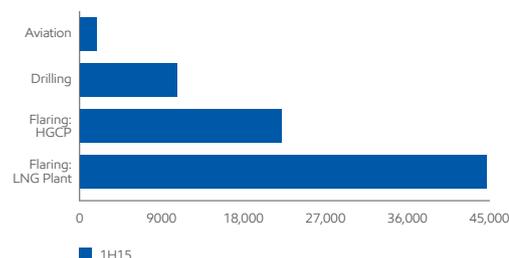
A third-party consultant began ambient air quality monitoring and training of EMPNG site environmental specialists in April. Sample sites were established at the LNG Plant, HGCP and Hides Waste Management Facility. Data will be collected over a 12-month period to generate an updated air model for these facilities. This will help EMPNG to better understand the company's air emissions profile during production.

To enable accurate air modelling, weather stations at the LNG Plant and HGCP are being adjusted in accordance with specialist recommendations to improve the quality of meteorological data collected.

Flaring activities at EMPNG facilities remain stable, with greenhouse gas emissions attributable to flaring recorded at 22,100 tonnes of carbon dioxide equivalent at the HGCP and 44,600 tonnes at the LNG Plant for the first half of the year. During the same period, the Drilling organisation generated 10,661 tonnes of carbon dioxide equivalent, while aviation produced 1780 tonnes, as shown in Figure 7.1.

**Figure 7.1 - Greenhouse gas emissions**

Tonnes of carbon dioxide equivalent



EMPNG calculates and reports total greenhouse gas emissions, including fuel gas use, on an annual basis. Total 2014 greenhouse emissions were calculated at 3.2 million tonnes of greenhouse gas produced for the full year across all EMPNG facilities.

## 7.2 Noise

EMPNG is engaging third party consultants for noise monitoring services at the LNG Plant, Hides Waste Management Facility and HGCP. These services include taking noise readings within the facilities and at the perimeters then using the data collected to update the EMPNG noise model.

The consultants will also train EMPNG site environmental specialists to conduct ongoing noise monitoring. This work is expected to be complete by the end of 2015.

Preventive maintenance continues on operational facilities to mitigate noise associated with production. As a result, no noise-related grievances were received in the first half of 2015.

## 7.3 Water

EMPNG uses water extracted from sources such as groundwater, seawater and streams for potable drinking water in camps and for production activities. The company tests the quality of extracted water and monitors processed wastewater to ensure conformance with the ESMP.

### 7.3.1 Consumption

Water is used during EMPNG operations for domestic purposes at worker camps, for drilling activities and for cleaning utilities, safety showers and firewater systems in process plants. Water is also used for dust control and washing vehicles.



Plate 7.2 – Water truck suppressing dust at the Permanent Facilities Compound

Volumes of water extracted are tracked to ensure sustainable water usage and compliance with permitted volumes.

EMPNG regularly conducts water quality testing so that levels comply with water quality standards applicable for the intended use.

Freshwater used in Hides is sourced from groundwater. In the first half of 2015, approximately 135,000 kilolitres of groundwater was extracted and used for production and drilling operations.

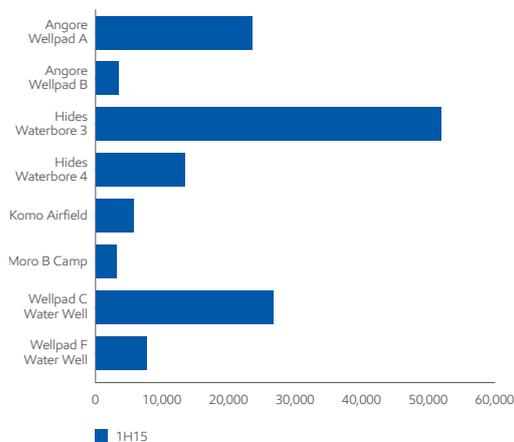
Water quality testing showed that extracted groundwater from the HGCP, Moro B Camp and Komo Airfield bores generally complied with the raw water quality criteria. Subsequent treatment and verification sampling was conducted in instances where groundwater did not meet the criteria, to ensure that treated water was suitable for use.

At the LNG Plant, 305,200 kilolitres of seawater was extracted to supply the desalination plant. This was used to generate almost 38,200 kilolitres of potable water.

Freshwater volumes taken from each extraction source in the first half of 2015 are shown in Figure 7.2.

**Figure 7.2 - Freshwater extraction**

Volume (kilolitres) by extraction source



Annual water usage data for 2014 showed that water extracted from Komo Airfield water bores exceeded permitted volume limits because the volumes provided in the original permit application assumed that Komo Camp would demobilise by March 2014, but this did not occur until August 2014. A burst water main and filling of two firewater tanks, each holding approximately 974,000 litres of water, also resulted in excess water use.

The total 2014 water extraction volume from Komo Airfield bores was less than amounts extracted during the construction phase and presented no observable impact on surface water levels in creeks and streams near Komo Airfield.

EMPNG has reviewed current water extraction requirements for production and will present these to the Papua New Guinea Conservation and Environment Protection Authority and Water PNG.

### 7.3.2 Water quality monitoring

EMPNG regularly monitors the quality of the company's wastewater, process water and surrounding receiving water bodies.

Wastewater treatment plants are operated in accordance with manufacturer specifications, which include regular desludging and weekly operational effluent monitoring. EMPNG and third party laboratories analyse water samples, with the results of this analysis used to determine EMPNG's conformance with ESMP requirements.

Regular monitoring of wastewater treatment plants in Upstream area camps showed that they were compliant in 60-97 percent of weekly sampling events during the first half of 2015, with nine low-level incidents reported for exceedance of wastewater management criteria. EMPNG is investigating parameters reported to be above criteria and action plans are being developed and implemented at each treatment plant. Monitoring of the receiving water bodies confirmed that no environmental impacts were observed as a result of these exceedances and the quality of the receiving waters complied with Papua New Guinea's freshwater guidelines.

Four low-level incidents were raised during the first half in relation to sewage spills. One spill to ground occurred at the LNG Plant when stormwater entered the wastewater treatment system through upstream pipe work and a lift station. Repairs were conducted on all sewage system manholes and lift stations and monitoring was undertaken to prevent a re-occurrence. The second sewage spill occurred at Angore when material was being transferred into an interim holding tank while a wastewater treatment plant was being replaced.

Two sewage spills occurred at the Permanent Facilities Compound in January 2015 when partially treated sewage overflowed from a holding tank and spilled to ground. One spill was 150 litres and the other was 20 litres.

A new wastewater treatment plant was installed at Komo Airfield in the first half to support aviation facility operations. The new plant replaces the construction wastewater treatment plant, which was decommissioned in the fourth quarter of 2014. An additional wastewater treatment plant was brought online to support the existing plant at Angore Wellpad A, which is used for a worker camp and drilling operations.

The Drilling organisation is using temporary wastewater treatment plants to support drilling operations. During the first half of 2015, a temporary wastewater treatment plant was decommissioned at Wellpad G. Meanwhile, maintenance was conducted on the wastewater treatment plant at the Drilling contractor's office on the Hides Wellpad Access Road to address identified deficiencies that were reflected in the plant's discharge quality report.

Monitoring of process water within the LNG Plant site and HGCP retention ponds showed that EMPNG was operating within the prescribed process water management criteria except for two exceedances at the HGCP, which resulted in two low-level incidents being recorded.

Monitoring of receiving water bodies confirmed no environmental impacts as a result of these exceedances and that the quality of receiving waters complied with Papua New Guinea's freshwater guidelines.

Groundwater monitoring is conducted at the LNG Plant, HGCP and Hides Waste Management Facility, with the timing of monitoring coinciding with seasonal extremes between the wet and dry seasons. Monitoring conducted early this year found that the LNG Plant and HGCP were below baseline conditions or within natural background variations. Groundwater samples collected at the Hides Waste Management Facility were consistent with baseline conditions, with the exception of the dissolved metals iron, cobalt and manganese. Previous monitoring events have shown these to be characteristic of the natural groundwater environment and not associated with activities undertaken at the site.

## 7.4 Materials management

EMPNG aims to avoid significant impacts associated with the procurement and use of raw materials wherever possible. Occasionally some aggregate from quarries is required for repair works, maintenance or special projects.

In the first half of 2015, approximately 4155 cubic metres of limestone was sourced from Wellpad C and side-casted material from Wellpad G in the Upstream area. This was used for works such as: road maintenance, helipads, the construction of storage areas and erosion repair works at the HGCP; backfill for foundations supporting Wellpad E; upgrade of foundations at Wellpad G; and erosion management at Komo Airfield. An additional 5270 cubic metres of sand and gravel was purchased from approved third party suppliers for bedding and concrete works. Approved third party suppliers also provided more than 1 cubic metre of recycled timber for production activities.

## 7.5 Spill prevention and response

EMPNG has dedicated plans, equipment, drills, personnel and workforce training in place to reduce the likelihood and consequences of emergency situations. This includes both liquid and gaseous hydrocarbon spill prevention and response.

In the first half of 2015, the company recorded nine low-level incidents involving five hydrocarbon spills, two sewage spills to ground (as described in *Section 7.3.2 Water quality monitoring*) and two chemical spills to ground. All of the hydrocarbon spills were less than 2 litres, with the exception of one 10-litre diesel spill.

One of the chemical spills occurred when 50 litres of drilling fluid additive leaked from a storage container during transportation. The other chemical spill of 7 litres occurred when transferring drilling waste from a vacuum recovery truck to a storage tank.

Eight near misses were also recorded. Two of these related to minor leaks noticed during equipment checks, with appropriate responses deployed before a spill to ground occurred. The other six near misses were spills that were contained within sealed bunded areas or concrete.

The Drilling organisation reported four low-level incidents involving spills to ground in the first half. One spill involved 7.5 litres of drilling fluid, while the others were 1 litre or less in size.

An Environmental Leadership Award was presented to the Drilling organisation, by the ExxonMobil Development Company Vice President for drilling, in recognition of their outstanding performance in spill prevention. For example, Rig 702 recorded no spills in the second quarter of 2015 and Rig 703 achieved 587 consecutive days of no spills – even during its demobilisation.

During the first half of 2015, the Permanent Facilities Compound recorded two low-level incidents for hydraulic oil spills of less than 1 litre, two sewage spills as detailed in *Section 7.3.2 Water quality monitoring*, and five near misses for spills contained to sealed surfaces or concrete.

EMPNG is maintaining its proactive focus on spill prevention with 55 spill response drills conducted across worksites during the first half. The HGCP held 15 drills, the LNG Plant held eight and the Drilling organisation conducted 32. These spill response scenarios ranged from desktop exercises to field-based discussions, full equipment deployment and practical execution of response methods.

The drills covered scenarios such as: a condensate spill from one of the wellpads; a chemical leak at the Hides Waste Management Facility; an aviation fuel release from the fuel storage area; an off-site truck rollover; and oil releases offshore by a third party.



Plate 7.3 – River boom deployment simulation in February



Plate 7.4 – Shoreline deployment during an emergency response drill in February

Spill prevention and response was also covered in toolbox talks, site inductions and individual coaching of workers to reinforce the mandatory use of drip trays and absorbent pads on worksites. Regular inspections of spill kits occurred at all EMPNG sites.

## 7.6 Waste management

EMPNG reduces the amount of waste sent to landfill through the application of waste reuse initiatives and using approved third party facilities to recycle production waste where practicable.

The company's waste contractor maintains a waste register for all waste collected and received at production waste processing facilities.

The register records information such as the waste transfer number, waste classifications, quantities and treatment/disposal methods.

In the first half of 2015, the waste contractor sent more than 28 tonnes of scrap metal and 3 tonnes of waste wood to a Papua New Guinean recycling facility. Approximately 30 tonnes of used lead-acid batteries were sent to an approved recycling facility in Lae and more than 42,000 litres of waste oil were sent to another approved facility for reuse. In May, 10 cubic metres of waste paint materials from the construction phase were transported to an approved third party disposal facility in Australia.

The Hides Waste Management Facility is the primary location to manage all waste generated from worksites within the Upstream area. To more effectively manage combustible waste from pipeline operations and maintenance activities, the incinerator at the Kutubu Central Processing Facility was inspected, assessed and recommended for use from June.

The Drilling organisation's monthly waste volumes increased as expected and this trend will continue until their demobilisation. However, most of the waste was treated drill cuttings and these were reused as landfill base material at the Hides Waste Management Facility.

Putrescible camp waste, medical waste, waste paint, oily rags, filters and waste oil from the Upstream area are processed in the Hides Waste Management Facility high temperature incinerator. The incinerator is fitted with a baghouse scrubber to reduce air emissions during its operation. Weekly ash removal and maintenance activities are conducted on the incinerator.

During the first half of 2015, the incinerator processed 79,900 litres of waste oil and completed the disposal of waste oil from the construction phase three months ahead of schedule. It also disposed of some 15,600 bins of solid waste. Reclaimed crushed limestone aggregate from the former Kopeanda laydown area was collected for use as landfill cover, with 300 cubic metres of limestone reclaimed by the end of June.

All waste managed at the LNG Plant Waste Management Facility is generated by activities at the LNG Plant and marine facilities or the Permanent Facilities Compound construction site. There was a slight increase in the amount of waste processed at the LNG Plant in May and June due to the clean-up of wastewater infrastructure systems at a worker camp.

Capping was completed on two construction landfill cells, while an operational landfill cell remains in use for non-recyclable production waste.

Stormwater was drained from some of the open landfill cells as a result of high rainfall early this year. The stormwater was sampled and analysed to meet environmental management plan discharge criteria before being released.

As part of ongoing efforts to segregate waste at the point of collection, the LNG Plant has installed voluntary contraband bins outside the site's main access gates and specialised metal waste bins for the collection of oil-contaminated materials at plant areas.



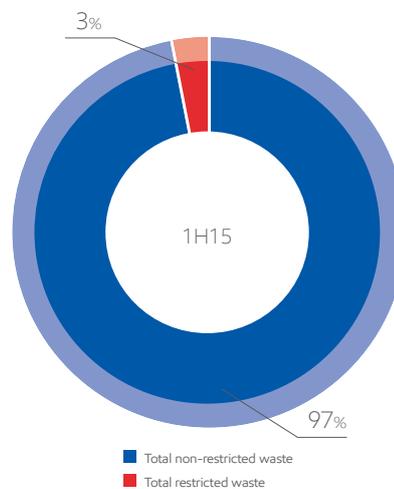
Plate 7.5 – Waste segregation bins at the LNG Plant Marine Terminal

Construction of the Permanent Facilities Compound is nearing completion, so the worksite's general waste incinerator was transported to the LNG Plant in May, ready for installation later this year.

Most waste produced in the first half of 2015 was classified as non-restricted, as shown in Figure 7.3.

Figure 7.3 - Waste types

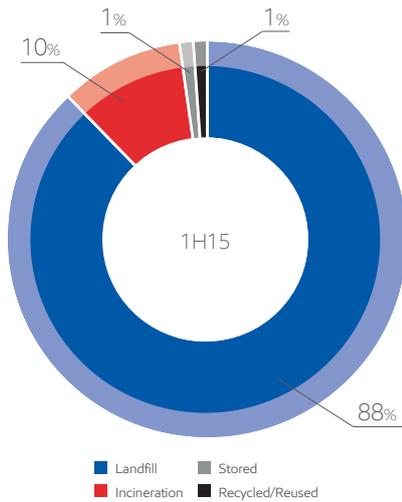
Percentage of waste generated by classification



The predominant waste sources were drill cuttings and food waste. Solid waste by disposal method is shown in Figure 7.4.

## Figure 7.4 - Disposal methods

Percentage of waste by disposal method



In June, 110 EMPNG workers participated in various volunteer activities in support of World Environment Day, as detailed in *Case study: EMPNG joins communities to celebrate World Environment Day*.

## 7.7 Reinstatement, erosion and sediment control

Ground and aerial inspections are used to monitor the effectiveness of EMPNG's erosion and sediment control measures in areas near production facilities. Specialist teams manage the repair and augmentation of control measures where needed.

In the first half of 2015, maintenance was conducted on erosion control measures at the HGCP and along the pipeline ROW at Homa Ridge and Kilometre Points 81, 85 and 100.

Remedial works for erosion control measures continued at Komo Airfield, with earthworks and seeding at the southern end of the site completed. Revegetation was also completed in the northwest. Earthworks commenced in the northeast section of the site.

In addition to EMPNG's monitoring, local communities are involved in Clan ROW Maintenance Agreements, whereby they notify the company of erosion issues along the pipeline ROW. These clans monitor vegetation cover and erosion and report the presence of unauthorised structures or vehicles on reinstated sites.

The clans reported no erosion or sediment control issues during the first half of 2015.

The Permanent Facilities Compound Reinstatement Management Plan aims to: establish stable landform conditions in areas disturbed by construction activities; and create

ground conditions conducive to natural regeneration. During the first half, topsoil was spread and tree and shrub planting was undertaken, at the site. Seed germination was observed as a result of hydro-mulching that commenced at the end of 2014 and was completed by mid-2015.



Plate 7.6 – Hydro-mulching on the sports field batter slope at the Permanent Facilities Compound in January 2015



Plate 7.7 – Progress of hydro-mulching grass at the Permanent Facilities Compound after one month

Bi-annual reinstatement audits of EMPNG sites have been conducted since 2012. An audit conducted by a third party consultant in the first half of 2015 found that most worksites disturbed in the Upstream area during construction had been reinstated.

A small number of sites will require ongoing maintenance and monitoring to address weeds or erosion. These sites have been included in EMPNG's ongoing surveillance programs. In addition to these surveillance programs, the progress of revegetation and habitat recovery is incorporated into EMPNG's biodiversity monitoring program.

# Case study

## EMPNG joins communities to celebrate World Environment Day

More than 850 volunteers from EMPNG, government agencies, schools and the PNG Hunters football team joined together to celebrate World Environment Day.

EMPNG invited community and government volunteers to participate in multiple World Environment Day activities held in the National Capital District, Hela and Central provinces on 5 June.



A World Environment Day event involving EMPNG volunteers and Papa Community School students and teachers



EMPNG volunteers distributing protective equipment before travelling to Para Primary School

“This year EMPNG celebrates its highest rate of volunteer participation since the company first began taking part in World Environment Day activities in Papua New Guinea,” said EMPNG Safety Health and Environment Manager, Dennis Vidmar.

At Papa Community Primary School, near the LNG Plant, about 250 volunteers cleared rubbish and planted 100 trees. Another 100 volunteers removed rubbish and debris from Ela Beach in Port Moresby.



Students from Ela Murray International School join EMPNG staff to clear rubbish at Ela Beach, Port Moresby



World Environment Day presentations at Para Primary School

“We are grateful to the many people and organisations who worked with us to make this happen. It is a great demonstration of our shared commitment to respect and protect the environment.”

In Hela Province, EMPNG workers presented environmental awareness sessions to some 250 people at Para Primary School.



Plate 8.1 – Rainbow bee-eater (*Merops ornatus*), a migratory bird that breeds in Australia and moves to Papua New Guinea during winter  
Copyright C.B. Frith

# 8 Biodiversity

EMPNG is implementing biodiversity management and monitoring programs to preserve Papua New Guinea's unique biodiversity.

## 8.1 Biodiversity management

EMPNG's Biodiversity Strategy governs the company's management of biodiversity in Papua New Guinea. The Strategy is implemented through the Biodiversity Offset Delivery Plan and the Biodiversity Monitoring Plan, which are designed to preserve and enhance biodiversity in the Upstream area.

In February, work began on the Biodiversity Surveys (Programmed Monitoring Activity [PMA]3) element of the Biodiversity Strategy with a reconnaissance trip. A team of eight national and international biodiversity specialists spent 30 days surveying 10 sites to establish long-term Biodiversity Assessment Areas.

Each site was surveyed during the day and at night for mammals, bats, birds, frogs and plants.

Three long-term Biodiversity Assessment Areas comprising 10 sites were confirmed. One along the Hides Ridge, representing high altitude ecosystems, contains six monitoring transects and two near Moro, representing medium altitude ecosystems, consist of four monitoring sites. For further information refer to *Case study: Committed to protecting biodiversity*.

Regeneration monitoring was also conducted as part of the Environmental Management Plan for the Upstream area. It replaces reinstatement monitoring conducted during the PNG LNG Project's construction phase. This monitoring compares plant community composition and structure in disturbed and undisturbed areas.

The New Guinea Binatang Research Centre, a Papua New Guinea-based scientific research organisation that specialises in tropical rainforest research, conducted the first regeneration monitoring survey during June and July 2015.



Plate 8.2 – Dr Stephen Richards, Team Leader – Frogs and Odonata from the Department of Herpetology, South Australian Museum surveying a potential Biodiversity Assessment Area

Biological information was gathered from more than 60 regeneration monitoring plots, covering both regenerating areas and undisturbed habitat types. Monitoring of the undisturbed plots includes identification of all trees with a diameter of greater than 5 centimetres to understand vegetation change as a result of environmental conditions (such as geology and altitude), as well as enabling analysis of vegetation change due to natural conditions, such as pest infestations.

Preliminary results for regenerating areas in the southern part of the ROW show regrowth between 2-3 metres.

In the northern section of the ROW, regenerating vegetation is not as tall due to the higher altitude. Regenerating plant species consist of native species and weeds.

A report describing the results of aerial and ground surveillance from the initial post-construction biodiversity assessment was finalised during the first half of 2015.



Plate 8.3 – New Guinea Binatang Research Centre team establishing monitoring plots along the pipeline ROW

This assessment, which forms part of Condition Surveys (PMA2) in the Biodiversity Strategy, provides an evaluation of construction phase biodiversity impacts and the effectiveness of biodiversity mitigation measures. In particular, it identifies the area of each type of forest, focal habitat and other sensitive ecological features impacted during construction.

Additionally, it assessed focal habitats and other sensitive ecological features avoided during construction, which could be used as comparative assessment sites.

Remote sensing imagery from 2011 and 2013 was also analysed to determine changes in broad forest conditions. The imagery forms part of the Remote Sensing of Indirect Impacts (PMA1) element of the Biodiversity Strategy.

This mapping approach was applied to the years 2009, 2011, and 2013, with changes in forest cover analysed between the time periods.

The analysis showed that the PNG LNG Project construction footprint was within the scope of the footprint outlined in the Environmental Impact Statement.

## 8.2 Ecological management

Mangrove regeneration monitoring during the first half identified new mangrove (*Rhizophora* sp.) saplings near the low tide mark at the LNG Plant landfall site. Older saplings of grey mangrove (*Avicennia marina*) were found to have reached between 60-80 centimetres tall. The regeneration of *Nothofagus* sp. seedlings continues to be widespread along the pipeline ROW and Hides Spine. Both *Nothofagus pullei* and *Nothofagus grandis* species have been growing well since a prolific flowering season in 2014. Seedlings of the local species of pandanus (*Pandanus julianetti*) are also growing on the ROW.



Plate 8.4 – A tagged tree in a regeneration monitoring plot along the pipeline ROW



Plate 8.5 – Flowering and fruiting sandalwood at the LNG Plant site



Plate 8.6 – Seedlings of pandanus and nothofagus at Wellpad G

Monthly monitoring continues of two sandalwood (*Santalum macgregorii*) trees at the LNG Plant site that are listed as endangered by the International Union for Conservation of Nature.

Monitoring in June showed that the sandalwood trees were found to have flowers and fruit. EMPNG has been collecting seeds as they fall from these trees to propagate seedlings as part of the company's biodiversity efforts.

Early this year, monitoring discovered the unauthorised removal of branches from one of the trees. To prevent a recurrence, EMPNG issued communications to the local community emphasising the value of the trees and the need for their protection.

Negotiations by EMPNG security personnel resulted with the release of an eastern long-beaked echidna (*Zaglossus bartoni*) from poachers in Moro early in the year. The echidna was hunted for sale in a local market.

This species is listed as critically endangered by the International Union for Conservation of Nature because hunting has reduced its population in many regions of Papua New Guinea and made the echidna extinct in some areas.



Plate 8.7 – The rescued eastern long-beaked echidna

### 8.3 Quarantine management

EMPNG and its contractors must comply with National Agriculture Quarantine and Inspection Authority regulations and procedures when managing the receipt of freight into Papua New Guinea and when loading sea freight containers.

Machinery, spare parts and other equipment are imported for production activities.

In the first half of 2015, EMPNG received 1253 shipments into Papua New Guinea. Of these, 243 were inspected, with only five percent of the inspected shipments requiring re-fumigation in accordance with National Agriculture Quarantine and Inspection Authority procedures.

## 8.4 Weed, plant pathogen and pest management

The seventh annual weed audit was conducted over April and May this year. The audit identified four new weed species at EMPNG sites: greenleaf desmodium (*Desmodium intortum*), cypress vine (*Ipomoea quamoclit*), granadilla (*Passiflora ligularis*) and Chinese bur (*Triumfetta rhomboidea*).

Greenleaf desmodium was originally introduced to Papua New Guinea as a fodder plant and was previously recorded in villages near the onshore pipeline ROW. Now present on the ROW, this plant is categorised as a Priority 1 weed. The other three new species are classified as Priority 3 weeds.

Cypress vine is commonly associated with gardens and has entered EMPNG facilities from a nearby garden. Granadilla is a cultivated passionfruit grown in gardens. In this audit, it was found on the Hides Ridge. Chinese bur is a widespread tropical weed found along roadsides and garden areas with seeds that are easily spread by sticking to animal fur.

The audit found that two previously identified Priority 1 weeds – anglestem willow primrose (*Ludwigia leptocarpa*) and bitter vine (*Mikania micrantha*) – had extended their range. Anglestem willow primrose, which was previously recorded at the Lake Kutubu weed management zone, was identified in the Lake Kutubu to HGCP weed management zone. Bitter vine was last recorded at Moro B Camp and has now also appeared at the Lake Kutubu to HGCP weed management zone.

Despite the extended range of some weed species, the weed audit found that overall weed diversity was below pre-construction survey levels. Similarly, the abundance of weeds has decreased across all audited sites, compared to pre-construction survey levels.

Based on ongoing reviews, the status of some weed species has been changed to reflect the current understanding of their presence in Papua New Guinea.

Many relate to weed species that are now considered as naturalised in Papua New Guinea. These include one previously categorised Priority 1 weed, cyperus (*Cyperus difformis*), one former Priority 2 weed and 13 previous Priority 3 weeds. A former Priority 2 weed, water primrose (*Ludwigia hyssopifolia*), has also been re-classified to Priority 3.



Plate 8.8 – Anita Mosby, EMPNG Biodiversity Advisor, demonstrating the difference between the two types of ludwigia: *Ludwigia leptocarpa* (left) is the Priority 1 weed anglestem willow primrose and *Ludwigia octovalvis* (right) is a benign Priority 2 weed

Some Priority 1 weeds were identified at the Permanent Facilities Compound in May. These included gamba grass (*Andropogon gayanus*), giant cane (*Arundo donax*), buffel grass (*Cenchrus ciliaris*), elephant grass (*Cenchrus purpureus*), centro (*Centrosema molle*), leucaena (*Leucaena leucocephala*), guinea grass (*Megathyrsus maximus*) and bitter vine.

Five species new to the site were recorded, three of which were only recorded as single individuals. Other species had increased in abundance from previously recorded levels, except for five species that decreased in abundance – with two of them not recorded on the site at all this year. The site contractor is controlling all weeds through grass cutting and herbicides.

EMPNG continues ongoing weed monitoring to reduce the spread of Priority 1, 2 and 3 weeds. The company also maintains worker education about Priority 1 weeds through newsletters, toolbox talks and workforce training.



Plate 8.9 – EMPNG vehicles on the Kantobo to Mubi River Access Road, which is controlled through a boom gate at Gobe

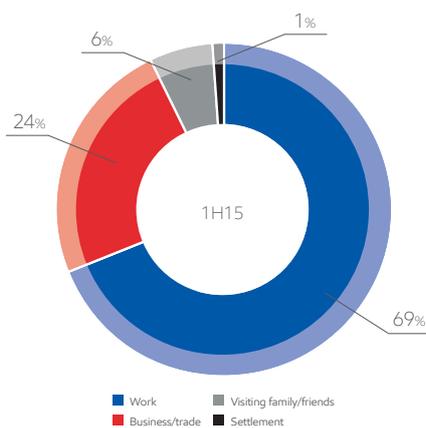
## 8.5 Access control

EMPNG’s access control system collects data from security checkpoints about the types of vehicles entering EMPNG-controlled roads and the reasons for using the roads.

In the first half of 2015, 11,149 vehicles used EMPNG access roads for purposes such as work, business/trade or visiting family or friends, as shown in Figure 8.1.

**Figure 8.1 - Purpose of access**

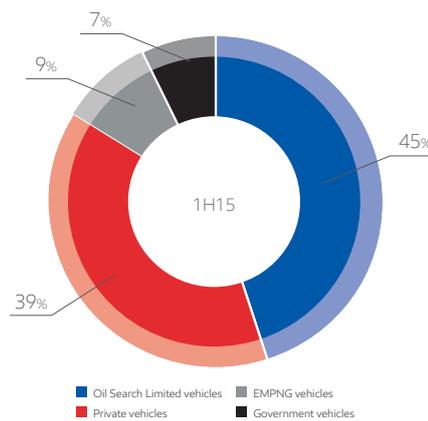
Percentage of traffic using EMPNG controlled roads by purpose



The types of vehicles that used EMPNG-controlled roads are shown in Figure 8.2.

**Figure 8.2 - Vehicle types**

Percentage of vehicle types using EMPNG access points



The company is effectively maintaining access control at the Hides Wellpad Access Road through the use of security checkpoints and worker site identification cards.

# Case study

## Committed to protecting biodiversity

EMPNG is implementing measures that monitor and preserve biodiversity near the company's operations, in accordance with commitments made in its Biodiversity Strategy and Environmental Management Plan for the Upstream area.

EMPNG's Biodiversity Strategy aims to protect biodiversity in the PNG LNG Project area by outlining how terrestrial biodiversity will be managed for the long-term. The Biodiversity Monitoring Plan, focused on EMPNG's Upstream area, defines performance indicators for each objective of the Biodiversity Strategy.

The Biodiversity Monitoring Plan aims to collect and analyse data for each performance indicator through a series of four PMAs. The PMAs are independent but complementary, with each designed to gather information for several performance indicators.

Work began early this year on the Biodiversity Surveys (PMA3) element of the Biodiversity Strategy. Regeneration monitoring has also been conducted as part of the Environmental Management Plan for the Upstream area.

The other two Assessment Areas, representing medium altitude ecosystems, are near Moro and consist of four monitoring sites. The positions of these Assessment Areas enable EMPNG to examine the impacts of the company's infrastructure on long-term trends in biodiversity at a species level at these locations.

Site selection involved an initial phase of desktop terrain and vegetation assessment based on Geographical Information System maps, followed by a site reconnaissance to finalise specific Biodiversity Assessment Areas.

The Biodiversity Surveys use a rapid assessment methodology, an approach that has proven to be highly successful in remote areas of Papua New Guinea. Species data collected will be used to evaluate performance across all Biodiversity Strategy objectives.

The key groups to be studied through these surveys are flora, mammals (rodents and bats), birds and frogs. To accurately identify species that may be new to science and enable the production of identification manuals for use during subsequent Biodiversity Surveys, the researchers may obtain limited collections of some specimens. The first Biodiversity Survey using the rapid assessment methodology commenced early June.



Undisturbed sites adjacent to disturbed areas are included in regeneration monitoring

### Biodiversity Surveys

Biodiversity Surveys aim to establish three long-term Biodiversity Assessment Areas within the PNG LNG Project area and collect biennial quantitative information on plant and animal community compositions. One Assessment Area has been established along the Hides Ridge, representing high altitude ecosystems and contains six monitoring transects.



One of a group of rainbow tree frogs (*Litoria iris*) observed at a small swamp alongside the Hides Access Road

# Case study

## Committed to protecting biodiversity

### Regeneration monitoring

Regeneration monitoring aims to evaluate regeneration performance.

It replaces reinstatement monitoring conducted during the PNG LNG Project's construction phase.

The program involves a benchmarking scoring system to evaluate the progression of plant community succession, where the condition of vegetation on a given plot is compared with a benchmark. The benchmark areas near the pipeline ROW will represent the species composition of a 20-year-old forest, as well as forests that are up to four years old. These will be compared with regenerated areas of the ROW.

The condition of forest adjacent to EMPNG infrastructure will also be assessed to monitor edge effects. Fixed and random sampling will be used every two years.

As part of the study, researchers will monitor changes in vegetation within the PNG LNG Project area resulting from post-construction disturbance. For example, from unauthorised access, or natural conditions such as landslides or pest infestations.

Specific aspects to be observed include the presence of species and the extent of their cover, encompassing trees and single-stemmed palms, lianas (any long-stemmed, woody vine that is rooted in the soil at ground level and uses trees to climb up into the forest canopy), other vines, coarse woody debris cover, life form types and soil erosion. Additional details will be gathered during monitoring for other analytical purposes. For example, measurements of tree height will be used to develop approximate estimates of carbon stocks at each site and changes over time. This has potential value for determining the effectiveness of the revegetation process.

Regeneration monitoring will also provide opportunities to assess forest fauna in both regenerated and undisturbed forest areas.

Early observations during preparatory work for the first regeneration monitoring show that ROW regeneration is progressing well, with a range of desirable forest plant species providing good vegetation cover.

### Up close



## Research Centre drives community conservation

The New Guinea Binatang Research Centre, located in Madang, is working with EMPNG and engaging local communities to encourage landowner participation in the regeneration monitoring and Biodiversity Surveys.

Centre Director, Dr Voitech Novotny, said: "Our approach to ecological surveys and research has always relied heavily on collaboration with local communities, recruiting local assistants for a range of activities – from simple guidance in the field to more advanced tasks of monitoring and data collection in the field. Some of the locally-recruited assistants are given an opportunity to participate in the Centre's training and, based on performance, become appointed as Centre staff and/or continue in further studies."

The Centre offers a postgraduate training program for Papua New Guinean Honours and Master of Science students, with six students currently enrolled. It also collaborates with other key national and international biological research institutions, including the University of Papua New Guinea, the University of Minnesota, the United States Smithsonian Institution and the Smithsonian Tropical Research Institute. The expertise of these research partners is being used for the Centre's work with EMPNG.



Researcher Maling Rimandai catalogues plant specimens at the Binatang Research Centre



Plate 9.1 – Manuel Dorum, Operations Technician Level 1, working through an operating procedure near the corrosion inhibitor pump at the HGCP

# 9 Performance

Monitoring and evaluation tools such as system assessments, site inspections, surveys, sampling and measurement are used to assess the effectiveness of the ESMP. These tools also enable EMPNG to determine whether mitigation measures designed to manage production risks are achieving their intended outcomes.

## 9.1 Incidents

EMPNG uses an incident management system to define its approach to managing incidents and near misses. An incident is a situation that has an unintended impact on a person's health, safety, security or livelihood, or has an impact on property, the environment, or legal/regulatory compliance.

A Severity Level of <0, 0, 1, 2, or 3 is assigned to incidents, where Severity Level <0 has no significant impact and Severity Level 2 or 3 require notification to the IESC or relevant government authority. EMPNG investigates the causes of incidents and near misses and implements corrective actions to reduce the likelihood of reoccurrence.

In the first half of 2015, EMPNG recorded 34 low-level environmental incidents classified Severity Level <0 and one Severity Level 0 incident.

Thirteen near misses were also recorded. All incidents were addressed and none resulted in a significant impact to the environment.

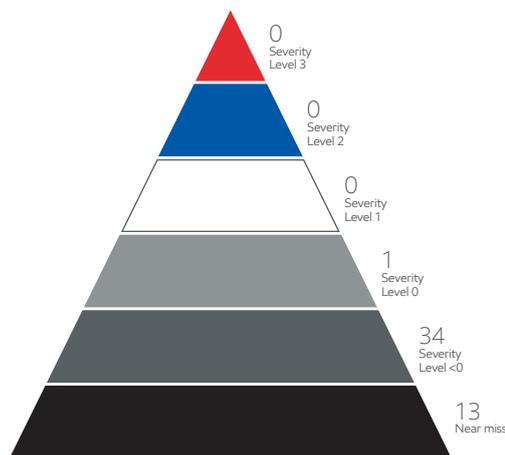
No Severity Level 2 or 3 incidents, requiring notification to the IESC or relevant government authority, occurred during the first half of 2015. Figure 9.1 shows the incidents and near misses recorded by Severity Level.

## 9.2 Monitoring and evaluation

EMPNG uses Exxon Mobil Corporation's Operations Integrity Management System framework to monitor, verify and assess its conformance with the ESMP.

**Figure 9.1 - Incidents**

1H15 numbers by Severity Level



EMPNG also uses this System to confirm where recognised risks are mitigated so that intended outcomes can be achieved.



Plate 9.2 – Field water sampling and testing equipment

The level of risk involved in an activity determines the type, extent and frequency of monitoring and evaluation.

The production verification program is implemented through site environmental specialists who inspect worksites, conduct field observations and monitor air, noise and water discharge in accordance with EMPNG's environmental protocols.

### 9.2.1 Results

Three Severity Levels are used to classify a non-conformance, which is defined as a situation that does not meet ESMP requirements.

The levels range from Severity Level I, which involves no damage or reasonable expectation of damage, to Severity Level III that requires expeditious corrective actions.

Non-conformance levels align with incident Severity Levels of <0, 0, 1, 2 and 3, as defined in EMPNG's incident management process.



Plate 9.3 – Sharon Lauatu, HGCP Environmental Specialist, performing groundwater monitoring at the HGCP

Potential non-conformance situations are detected through field observations, which identify an intervention and/or corrective action that is required to prevent a non-conformance. Examples of good environmental practices are recorded as positive field observations.

During the first half of 2015, 52 field observations requiring action to prevent a non-conformance were recorded. Seven of these were for erosion and sediment control management, 17 regarded waste management, three were for air emissions and monitoring, 17 related to water discharge and spill control, seven were for biodiversity-related aspects and one was for on-site vegetation control.

By the end of June, nine field observations remained open, with actions progressing to close these observations.

Three positive observations were also recorded during the first half of the year. Two related to spill prevention and waste management at the HGCP and the third was for effective engagement with local communities regarding the protection of erosion control measures.

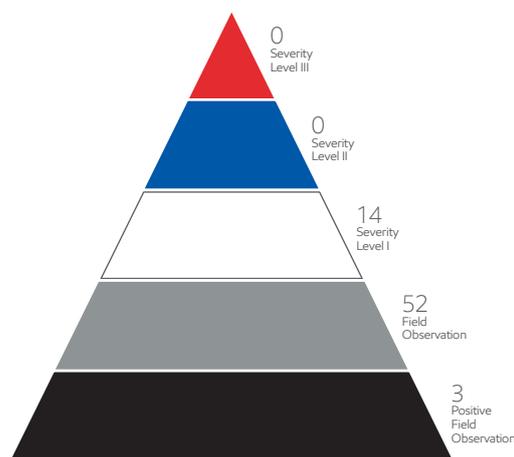


Plate 9.4 – An example of good spill prevention methods includes using drip trays under fuel-operated equipment

Fourteen Severity Level I environmental non-conformances were recorded during the first half of 2015, as shown in Figure 9.2.

### Figure 9.2 - Non-conformances and field observations

1H15 numbers by Severity Level



Eleven related to exceedances of wastewater management criteria, while two regarded sewage spills. These non-conformances were also recorded as Severity Level <0 incidents. The remaining non-conformance regarded a pollution control device at the HGCP and was also recorded as a Severity Level 0 incident.

There was no damage to the environment caused by any of the non-conformances recorded. Corrective actions are being implemented to prevent recurrence.



Plate 9.5 – IESC representatives and EMPNG subject matter experts outside the HGCP during the monitoring visit in May

### 9.3 External monitoring

The IESC completed monitoring visits in February and May to evaluate EMPNG's performance against environmental and social commitments made in the ESMP.

Findings from both the February and May visits, along with findings from each of the IESC's monitoring visits since the start of the PNG LNG Project construction phase, are available on the PNG LNG Project website.

Visit the website at  
[www.pnglng.com](http://www.pnglng.com)



The next IESC monitoring visit is planned for October 2015.



Plate 10.1 – Community Affairs Officer, Christine Yango, meeting with a women in Paua Village as part of EMPNG's community engagement activities

# 10 Stakeholder engagement

Communities and other stakeholders are kept informed about EMPNG's production activities through ongoing engagement and collaboration.

## 10.1 Communities

In the first half of 2015, EMPNG conducted 788 formal community engagements in 78 communities and 3169 informal engagements in 77 communities. These engagements involved more than 19,930 attendees.

In Upstream areas engagements focused on safety along the pipeline ROW, as well as road and traffic safety. More than 6140 students from 27 primary and elementary schools in Hides, Komo, Angore and Moro participated in an EMPNG 'Always Be Careful' road safety campaign. The campaign consisted of posters featuring Toea from the children's adventure book series. The posters outlined safe roadside procedures such as 'Stop, Look and Listen before crossing the road'.

EMPNG representatives also spoke with children about the importance of wearing bright coloured clothes when walking by the roadside so drivers could spot them easily.

Safety messages were translated into Huli to ensure greater understanding among the students.

Clans involved in caretaking activities along the pipeline ROW have received refresher training on topics such as: safety when cutting grass near the pipeline; and the process for reporting landslips or encroachment along the ROW.

EMPNG also provided Upstream communities with information about compensation payments and the process for 2015 deprivation payments.

In communities near the LNG Plant site, more than 2460 students from seven schools participated in road and pedestrian safety awareness programs.



Plate 10.2 – Idauwi Primary School students listen to a PNG LNG Project presentation

Communities near the LNG Plant site also received updates about production activities, safety zones near the LNG Plant Marine Terminal and information about EMPNG's community and school-based programs, such as the Science Ambassador Program.

Additionally, agricultural advice and support was provided to local farmers and advice was given to some local businesses.

### 10.1.1 Issues identification

As shown in Figure 10.1, economic issues accounted for 26 percent of all issues raised in the first half of this year.

These mainly related to questions regarding training and employment provided through EMPNG.

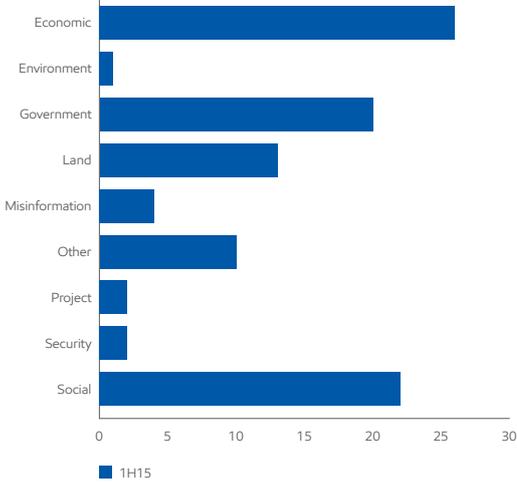
Social issues comprised 22 percent of the total, with some consisting of positive comments regarding EMPNG's stakeholder engagement activities.



Plate 10.3 – Gangulu Literacy School students learn about road safety as part of the ‘Always Be Careful’ campaign

**Figure 10.1 - Issues**

Percentage received by issue category



Other social issues concerned community health and requests for further communication of EMPNG’s marine safety zones.

In May, EMPNG produced additional marine safety communications materials for communities, including information translated into Tok Pisin and Motu.

Twenty percent of the issues related to government topics, with most regarding the Government’s distribution of royalties from LNG production.

These inquiries were sent to the Papua New Guinean Department of Petroleum and Energy for resolution.

Thirteen percent of the issues were for land concerns, with particular regard to compensation payments and land access.

## 10.2 Government

EMPNG is engaging with all levels of government to keep government representatives informed about production activities.

### 10.2.1 Infrastructure and government support

EMPNG is providing engineering advice and joint funding, with the Hela Provincial Government, for the construction of a new bridge across the Benaria River. Construction of the bridge and the associated Benaria bypass road started in early 2015. The company is also providing funding and engineering support for emergency repairs along sections of the Highlands Highway that were damaged by continuous heavy rainfall early this year.

Additionally, EMPNG is providing engineering support to the Hela Provincial Government for the construction of a public road that will cross the pipeline ROW near Tongoma Village in Awatangi.

The engineers are working with the Department of Works to ensure: control measures – such as berms and/or barriers – are installed to prevent vehicular access along the ROW; and pipeline integrity is maintained during construction of the road.

### 10.2.2 Advocacy

In early 2015, Papua New Guinea's Prime Minister, the Honourable Peter O'Neill, attended the signing of an agreement between EMPNG and the National Airports Corporation to enable commercial flights at Komo Airfield.



Plate 10.4 – Prime Minister, the Honourable Peter O'Neill speaking at Komo Airfield agreement signing ceremony

The 2015 advocacy program began in February, with Papua New Guinea Department of Petroleum and Energy senior managers receiving a briefing from EMPNG representatives about the status of production activities.

By the end of June, more than 95 dignitaries had attended advocacy workshops at the LNG Plant, including Australia's Minister for Trade and Investment, the Honourable Andrew Robb.



Plate 10.5 – A group of dignitaries, including Australia's Minister for Trade and Investment, the Honourable Andrew Robb, at the LNG Plant site

Advocacy workshops provide participants with an update on production progress, community development programs and national content initiatives, such as the training and development of local workers and suppliers.

This year's advocacy program aims to increase engagement between EMPNG production teams and senior government officials, regulators, government departments, representative stakeholder organisations, schools and community groups.

### 10.2.3 Benefits assurance delivery

Papua New Guinea's Department of Petroleum and Energy is working with other relevant government agencies and EMPNG to progress the clan vetting process for approval by the Papua New Guinean Government.

The clan vetting process identifies beneficiary clans from the PNG LNG Project area, which enables the Department of Petroleum and Energy to determine the appropriate allocation of benefits.

EMPNG continues to pay monthly royalty payments from LNG production to the Papua New Guinean Government for distribution to PNG LNG Project area landowners. The funds are held in a government-nominated trust account with the Bank of Papua New Guinea.

In accordance with requirements of the *Oil and Gas Act 1998*, EMPNG paid the annual Development Levy to the Government in early 2015. The Levy, which is equivalent to two percent of the wellhead value, is held in the Department of Petroleum and Energy trust account so that it can be paid to local-level governments and provincial governments for local infrastructure development.

### 10.2.4 Revenue management

In May, legislation was tabled to establish a Sovereign Wealth Fund to manage the distribution of oil, gas and mining revenues in Papua New Guinea. The exact timing of when the Fund will be implemented has not yet been confirmed. The Kumul legislation, aimed at restructuring the Government's management of the extractives sector, was also submitted to parliament in June for its first reading and was subsequently gazetted.

Papua New Guinea's Department of Treasury has appointed long time Treasury staff member, Lucas Alkan, to lead the country's Extractive Industries Transparency Initiative (EITI).



Plate 10.6 – EMPNG Managing Director, Andrew Barry, presenting at the UK-Papua New Guinea Trade and Investment Forum, London

The 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.

The Treasury Department also appointed Manu Momo as Deputy Secretary for Economic Policy. The first Papua New Guinea EITI Annual Activity Report was submitted to the National Secretariat in June. This Activity Report and other EITI information is accessible on the Papua New Guinea Department of Treasury website.

In June, the final draft of the World Bank-funded EITI scoping study was submitted to the multi-stakeholder group for review. Invitations were subsequently sent to qualified vendors for the role of Independent Administrator. The Independent Administrator will compile the EITI country report, drawing on revenue and production data from producing companies and government agencies responsible for receiving and managing related revenues.

Papua New Guinea was officially accepted as a candidate EITI country on 19 March 2014. EMPNG is among 21 members of the EITI multi-stakeholder group and ExxonMobil has served continuously on the EITI board since its inception in 2002.

### 10.3 Media

The first and second editions of *PNG LNG TIES*, an eight-page pictorial broadsheet-sized newsletter, were published in March and June respectively.

*PNG LNG TIES* features production and business updates as well as stories about EMPNG's interactions with local communities. It replaces the bi-monthly community-based *PNG LNG Newsletter* and the *PNG LNG TokTok*, which was a four-page pictorial newsletter published every quarter in daily newspapers during the PNG LNG Project construction phase.

Seven thousand copies of each *PNG LNG TIES* edition have been published for distribution to EMPNG workers, local communities and other stakeholders. The newsletter is also published on the PNG LNG Project website.

In February, EMPNG Managing Director, Andrew Barry, presented a production overview to the Papua New Guinea National Leaders Summit in Port Moresby. Mr Barry also delivered a PNG LNG Project overview presentation to the inaugural UK-Papua New Guinea Trade and Investment Forum held in London in June.

ISSUE NO. 1, MARCH 2015

**PNG LNG to assist with power generation in Port Moresby and Hides**

**ExxonMobil PNG continues to work with the government of Papua New Guinea to help improve the quality of life for Papua New Guineans.**

both parties reached an agreement to supply power for Port Moresby.

Initially, the PNG LNG Project will supply power from the LNG Plant – when available – to PNG Power which will then distribute it to customers. The second phase is the provision of up to 20 million cubic feet a day of domestic natural gas, which is expected to fuel a new State-owned gas-fired power generation unit to be built in Port Moresby.

"This agreement enables a reliable long-term supply of natural gas to support Port Moresby's urgent power generation needs," says Andrew Barry, ExxonMobil PNG Managing Director.

This is in addition to an existing commitment for gas supply in Hides.

"This agreement enables a reliable long-term supply of natural gas to support Port Moresby's urgent power generation needs," says Andrew Barry, ExxonMobil PNG Managing Director.

"There is still work for PNG Power to do to get the necessary infrastructure in place, but we expect to be able to provide the first phase of the power to PNG Power by the middle of 2015."

**Inside this issue:**

- 1 Arrival of Papua
- 2 Revenue and supply explained
- 3 Andrew Barry's new Managing Director
- 4 Peter Graham bids farewell
- 5 Health equipment for PNG
- 6 Lucky escape for the ex-convict
- 7 Meet our people
- 8 Safety tips – Skalen

**Message from Andrew Barry, Managing Director**

Welcome to the very first edition of PNG LNG TIES!

PNG LNG TIES is about the relationships that we continue to build with government, business partners and communities throughout our operations area. It's about Teamwork, Integrity, Environment, Excellence, Safety and Security... or TIES for short.

It's about our culture to achieve things collectively, and a recognition of all the different groups and people who have contributed to our successful start-up and continuous safe operations.

The stories in this edition are just a few examples of the many results we've accomplished because of these partnerships, and because of the commitment and investment that so many people have made.

From China there's a story about a ship called Papua that was built to transport LNG from Papua New Guinea, and there's another story about two men in Kutubu who helped a rare ex-convict escape captivity.

And there's important information made about royalties and revenue.

On a personal note, having just taken on the reins of leading this incredible operation from my predecessor Peter Graham, I'm excited about the future and getting to know people here and building on our accomplishments so far.

I hope you enjoy the stories, and if you have one you'd like to share with us, you can get in touch with the PNG LNG TIES editorial team at [pnglgties@exxonmobil.com](mailto:pnglgties@exxonmobil.com)

Happy reading!

Plate 10.7 – The first edition of PNG LNG TIES

An event was held at the LNG Plant on 2 July 2015 to commemorate the delivery of the first 25 megawatts of domestic electricity as part of a Memorandum of Understanding between EMPNG and the Papua New Guinean Government.

EMPNG has committed to supply domestic gas to support the Government's plans for improving the capacity and reliability of the country's power supply. Papua New Guinean Government representatives, the media and other key EMPNG stakeholders attended the event.

The twentieth PNG LNG Quarterly Environmental and Social Report, which covered production activities in the fourth quarter 2014, was published on the PNG LNG Project website.

Visit the website at [www.pnglng.com](http://www.pnglng.com)

The Report's Executive Summary was also published in Tok Pisin. Printed copies of the Report were made available to stakeholders with limited access to the internet.



Plate 11.1 – Aerial view of the HGCP

# 11 Acronyms

Acronym	Definition
1H15	First half of 2015 – 1 January to 30 June 2015
EITI	Extractive Industries Transparency Initiative
EMPNG	ExxonMobil PNG Limited
ESMP	Environmental and Social Management Plan
GWIM	Global Women in Management
HGCP	Hides Gas Conditioning Plant
IESC	Lender Group's Independent Environmental and Social Consultant
Lanco(s)	Landowner company (companies)
LNG	Liquefied Natural Gas
PMA	Programmed Monitoring Activity
PNG	Papua New Guinea
ROW	Right of Way
TVI	The Voice Inc.



## Port Moresby – Project headquarters

ExxonMobil PNG Limited  
Jacksons Parade  
Port Moresby  
National Capital District  
Papua New Guinea

GPO Box 118  
Port Moresby  
National Capital District  
Papua New Guinea

Email [pnglngproject@exxonmobil.com](mailto:pnglngproject@exxonmobil.com) | Web [www.pnglng.com](http://www.pnglng.com)

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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 (USD\$) is 0.3645 [PGK1 = USD\$0.3645]. This rate is as published by the Bank of Papua New Guinea at 30 June 2015.



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