

**PERU LNG**  
**INDEPENDENT ENVIRONMENTAL AND SOCIAL MONITORING – IESM**

**2012 ANNUAL MONITORING PROGRAM**

***PLANT AND PIPELINE REPORT***

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## EXECUTIVE SUMMARY

Walsh Perú S.A. (WALSH) was contracted as the independent environmental and social monitoring consultant (IESMC) for the operation phase for the PERU LNG (PLNG) and Upstream Operations (the Project).

The scope of work of this report is summarized as follows:

- 1) Analysis of project information and documents gathered on the last field visit;
- 2) Assessment of performance against Lenders' Operational Policies and International Performance Standards regarding environmental, social, health and safety issues, relevant to the PLNG project; and
- 3) Summarize, analyze and address potential social and environmental risks and requirements of the operational phase to avoid and mitigate negative impacts to affected population, employees and to the environment.
- 4) Follow up on pending items on next filed visit.

This report represents the first independent monitoring field visit to PLNG made by Walsh serving in the role of the IESMC. This monitoring mission corresponds to the review of the Project's performance during the 2<sup>nd</sup> semester of 2012 as reported in the Environmental, Social and Health and Safety Semi Annual Compliance Report. The purpose of this visit has been to monitor conformance with Project environmental and social commitments made during the current operations phase of the project.

Commitments made by the PLNG for environmental and social management are defined in the following documents:

- (1) The Environmental and Social Management Plan (ESMP) as the main document defining ESHS programs and commitments for project impact management
- (2) The Environmental and Social Provisions for PLNG Common Terms Agreement (CTA) containing actions required to demonstrate compliance with Lenders requirements:
- (3) The ESAP 517 (g) – Part A to Common Terms Agreement

These documents together define the roadmap to achieve Lenders' compliance as defined by the International Finance Corporation (IFC) Performance Standards (PS), the Inter-American Development Bank Operational Policies (OP) and benchmarks against which the IESC audits the Project.

Walsh's Independent Environmental and Social Monitoring Consultant (IESMC) team visited the Peru LNG (PLNG) Plant located in Pampa Melchorita and segments of the pipeline to evaluate the Project's compliance of the Environmental, Social, and Health and Safety Management System (ESHS-MS) on the operation phase. Walsh's IESMC team recognizes PLNG's cooperation and assistance on field visit arrangements and information sharing. However, in the opinion of IESMC team, the scope work was limited by time and impossibility to visit all affected areas.

PLNG's demonstrates overall compliance of the required standards. ESHS-MS in the operations phase is well implemented and handled and due to this reason, PLNG maintains overall good relationships with communities, employees and parties involved. Nevertheless, there are pending items that need to be addressed and the IEMSC team will evaluate its development on the next site visit.

## **1.0 INTRODUCTION**

Walsh Perú S.A. (WALSH) was contracted as the independent environmental and social monitoring consultant (IESMC) for the operation phase for the PERU LNG (the Project) and Upstream Operations.

The Project involves the operation of a 4.4 million metric tons per year LNG export facility (the plant and the marine loading facility) located near San Vicente de Cañete, and a 408 km long pipeline from Chinqintirca, Ayacucho, to the Plant. In addition, the Upstream facilities consist of Block 56 gas field and related flow lines to the Malvinas Gas Plant.

### **1.1 OBJECTIVE**

The primary objective of the IESMC is to provide a coherent, integrated environmental and social monitoring of the Project's environmental and social compliance and potential risks. The environmental and social monitoring services will independently review and verify the Project compliance against the environmental and social commitments made within the Common Terms Agreement and reference compliance framework based on local and international standards and guidelines. This will allow gaps and risks to be identified and necessary mitigation and follow up actions to be defined, if necessary.

### **1.2 SCOPE OF WORK AND ACTIVITIES PERFORMED**

As this was the IESMC's first visit of the project and having PLNG achieved Project Completion the 2013 mission combined the familiarization and the last semi-annual monitoring tasks.

#### **Familiarization**

The familiarization consisted of a desktop review and included an evaluation of available project information and the identification of all guidelines and international standards regarding environmental, social, health and safety, and archaeological issues, relevant to the Operation Phase PLNG project (Reference Framework). This also included identifying relevant pending issues from the Construction Phase that should be closed during the Operation Phase.

The activities to achieve familiarization included:

- One day (April 3, 2013) IESMC team meeting to discuss the key environmental, social and health and safety issues identified for PLNG project from the documentation revision done. This meeting also was used to share each team member's previous personal experience regarding the project and identify responsibilities for each topic that should be covered during the mission.
- Two days (April 4-5, 2013) for project familiarization with the participation of Lenders, IESMC and PLNG staff. During this familiarization process, PLNG staff made presentations regarding the project status, main operation and maintenance activities made during 2012, implementation of the Environmental, Social and Health and Safety (ESHS) Management System for the operation phase, internal and external audits results, KPI and future modification projects.

A meeting between Lenders and the IESMC team to review relevant issues, main challenges, the Environmental and Social Action Plan (ESAP) and loan commitments, Lenders and monitoring team expectations, monitoring strategy and focus of field visit.

## Monitoring

The scope of monitoring included:

- 1) Evaluation of available project information/documents;
- 2) Field verification of reported performance and compliance;
- 3) Assessment of performance against Lenders' Operational Policies and International Performance Standards regarding environmental, social, and health and safety issues, relevant to the Peru LNG (PLNG) project; and
- 4) Review of the Project's Environmental, Social and Health and Safety Semi Annual Compliance Report (ref 2<sup>nd</sup> semester of 2012).<sup>1</sup>

The activities to achieve the monitoring included:

- One day (April 8, 2013) visit to Melchorita LNG Plant in separate teams

The EHS team, after the safety induction, received two presentations from COLP staff. One regarding the plant unit, the operation processes and key process indicators and the other regarding the general shutdown made on November 2012 and principal results obtained.

Facilities inspected during the visit included domestic effluents treatment plants, the temporary waste storage site, marine facilities and the shoreline beside the jetty.

Meetings were held with Plant staff to verify the implementation of key environmental, health and safety (EHS) procedures for operation phase.

The social team visited Chinchá Alta (Department of Ica), accompanied by PLNG social director and staff, to meet Condoray executive director and staff involved in provision of technical assistance to commercial business established by affected fishermen with compensation received from PLNG. It also visited three fishermen businesses in Tambo de Mora.

- Two days (April 9-10, 2013) visit to Ayacucho to review Pipeline Operation and Maintenance.

The IESMC team did an over-flight of the pipeline between approximately KP 10 to KP 132. KP 0 to KP 10 over-flight could not be done because of the clouds covering the RoW (Right of Way) over that segment. The objective of the over-flight was to verify the erosion control, the stability and recovery of vegetation cover of RoW.

The EHS team visited KP 83 and KP 85 to observe the status of bio-restoration. Explanation about the bio-restoration monitoring was received from BMAP (Biodiversity Monitoring and Assessment Program) team working in that site.

A site visit to KP 129 was made to inspect the safety and health procedures applied by a COGA (COLP contractor) DDV maintenance team. Erosion control and vegetation cover were also evaluated and some interviews were made to PMSAP monitors and Techint workers (COGA subcontractor).

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<sup>1</sup>However, when relevant and available, the report includes information regarding 1<sup>st</sup> quarter of 2013.

The social team visited Huaytara Peasant Community (Huancavelica Region) and Huayraccasa Peasant Community (Paccha Annex), which are communities traversed by the PLNG gas pipeline.

Before returning to Lima, the IESMC did a closure session with PLNG and the lenders to provide initial input on the results of the mission.

### 1.3 LIMITATIONS OF THE SCOPE OF WORK

The IESMC team recognizes PLNG's cooperation and assistance on field visit arrangements and information sharing. However, in the opinion of IESMC team, the scope of the first IESM was limited by two factors:

- (1) Relative short time available for field verifications, shortened by long traveling distances between the plant and the pipeline and within the pipeline sections; and
- (2) Unfeasibility to visit three key areas/stakeholders requested in the agenda proposed by the IESMC to Lenders and PLNG: (i) visit/inspection of the pipeline trench between KP1 and KP10, due to weather conditions affecting the over-flight; (ii) visit to and interviews with *Vinchos* community, due to ongoing negotiations between the community and TgP and the status of negotiations between PLNG and community leaders; (iii) visit to and interviews with *Chiquintirca* community due to long travel distances and time limitations; and, (iv) meetings with Herbay fishermen association.

### 1.4 INTERVIEWED PERSONS AND DOCUMENTS REVIEWED

Table 1 lists PLNG managers, staff and other stakeholders with whom IESMC had the opportunity to exchange information/views.

**Table 1** List of Interviewed Persons

Name	Organization - position
Pablo Taborga	PERU LNG – QHSE Manager
Giovanni Champin	PERU LNG - Environmental Coordinator (Pipeline)
Silvana Camacho	PERU LNG - Environmental Supervisor (Plant)
Carolina Casareto	PERU LNG – Environmental Manager
Julio Rojas	PERU LNG - Community Affairs and Social Investment Manager
Jenny Lozada	PERU LNG – Community Relations Senior Representative (Lima)
Alberto Sommaruga	PERU LNG – Community Relations Coordinator
Juan Valverde	PERU LNG – Community Relations (Pipeline Costa)
Carlos Hinojosa	PERU LNG – Community Relations Director (Sierra 1)
Nilton Quispe	PERU LNG – Community Relations Director (Sierra 2)
Leandro Mariátegui	PERU LNG – Social Database
Simon McGuire	PERU LNG – Pipeline Operations Manager
Antonio Gutierrez	PERU LNG –Health and Safety Manager
Gisela Cornejo	PERU LNG – Safety Coordinator

Name	Organization - position
Milagros Panta	CONDORAY – Director of Technical Assistance Program for Fishermen Businesses
Diana Celi	CONDORAY - Technical Assistance Program for Fishermen Businesses
Patricia Munian	CONDORAY - Technical Assistance Program for Fishermen Businesses
Mr. Alejandro Hernandez	Affected /compensated associated fisherman from Tambo de Mora
Mr. Antonio Loyora	Affected /compensated associated fisherman from Tambo de Mora
Mr. Atunka	Affected /compensated individual fisherman from Tambo de Mora
Mr. Chaves	Affected /compensated individual fisherman – Chincha
President and leaders	Huaytara Peasant Community
President and leaders	Huayraccasa Peasant Community (Paccha Annex)

## 1.5 DOCUMENTS REVIEWED

A list of all documentation reviewed as part of the familiarization workshops and the site visits can be found in Annex 1.

## 1.6 PROJECT DESCRIPTION

### 1.6.1 LNG PLANT

The LNG Plant in Pampa Melchorita, located at km 169 of the South Panamericana Highway, was issued the Operating Permit on June 22<sup>nd</sup>, 2010. The Contractor, EPC, supplied the installations on October 14<sup>th</sup>, 2010.

Natural gas arrives to the Plant and goes to the processing facilities to be liquefied. Here, the gas is conditioned, liquefied and finally stored as LNG (Liquefied Natural Gas). LNG is loaded into LNG carriers, which are tank ships designed for transporting LNG, and is finally exported. A total of 8'735,690 m<sup>3</sup> of LNG have been loaded on ships on the year 2012.

#### Processing Plant and Facilities

The plant has a natural gas reception unit where solid impurities are removed through filters and the volume of gas is measured. Then, the gas is passed to another unit for the removal of acid gases such as carbon dioxide (CO<sub>2</sub>) and hydrogen sulfide (H<sub>2</sub>S). The next step is to remove water vapor from the gas by dehydration, where a molecular sieve removes any water content acquired by the gas in the acid gases removal unit. The gas passes through the activated carbon column to remove mercury (Hg) and other heavy metals, if any. The fact that the Camisea gas does not contain sulfur or heavy metals is an outstanding environmental and economic advantage for the Project.

Once the natural gas has been conditioned, it goes to a pre-cooling cycle through a propane heat exchanger. Then, cooling is performed inside the Main Cryogenic Heat Exchanger (MCHE), using a mixture of cooling fluids composed of propane (C<sub>3</sub>H<sub>8</sub>), ethylene (C<sub>2</sub>H<sub>4</sub>), nitrogen (N) and methane (CH<sub>4</sub>) which puts the gas into liquid state at normal atmospheric pressure.



Finally, the LNG is stored in two cryogenic tanks of 130,000 m<sup>3</sup> each with a pressure of 1.08 bar and a temperature of -163.1° C.

The Melchorita Plant is equipped with turbo generators for the production of its own electricity, a Reverse Osmosis unit for treating sea water into potable water, a nitrogen generator, a unit for production of compressed air, flares for burning gases resulting from ship's boil off or emergency releases, storage facilities for chemical products, gasoline and diesel storage tanks and fuel dispensing facility for the company's vehicles, a laboratory, a domestic wastewater treatment system and an industrial wastewater treatment system. The plant is also equipped with the appropriate instrumentation to detect flammable gases and fires in the processing areas. There are also areas such as warehouses, workshops, personnel camps and medical facilities.

The plant's performance has reached high levels of energy efficiency. Energy efficiency is measured as the ratio of energy shipped as LNG (MMBTU) to energy input (MMBTU) into the plant. The average energy efficiency was 91.05% for February of 2011, 91.02% for all 2012, and 92.04% for 2013 to date. Such levels of energy efficiency mean less energy consumption and, consequently fewer greenhouse gases emission. Other indicators, such as utilization (96.9%), availability (97.6%) and reliability (97.8%) were also achieved during the first quarter of 2013, showing a well-managed operating performance. This has been the result of improvements made to the operations during the last plant shutdown (November 2012).

In the last years, there was a significant reduction of the volume of flared gases. 1,319.7 MMscf (million standard cubic feet) and 652.2 MMscf of gas were flared in 2011 and 2012, respectively. The volume of flared gas during the first quarter of 2013 was 157.2 MMscf.

Loading of the LNG into the LNG carrier requires the return back to the plant of remaining boiled off natural gas from the ship's tanks. Since the optimization of the loading procedures, the volume of burned gases has been reduced as follows:

	Last Quarter 2011	All Quarters 2012	First Quarter 2013
Volume of Burned Gas per Ship (MMscf)	10.5	3.5	1.5

In March 2012, dredging work was performed on port facilities, as well as the proper preventive maintenance. On the same year, turbo generators maintenance and cleaning up of the blades of the cooling fluids aerial coolers was also performed. A general shutdown of the plant was necessary for inspection, repairs (such as plugging of MCHE leaking tubes), upgrade combustion components, and cleaning up of the blades in turbines in January and November.

#### PLNG's Future Projects

One of the PLNG's projects is to build a LNG truck loading facility to supply natural gas to areas that currently do not have access to the natural gas through pipeline. The DIA (Environmental Impact Declaration) includes construction, commissioning, operation, maintenance and decommissioning and has already been approved by DGAAE. To start the construction of the loading area it is

necessary to build third party regasification facilities on the final destinations areas which have yet to be determined by the Government of Peru.

A project considered for future development would be to obtain ethane ( $C_2H_6$ ) from the raw natural gas to replace ethylene ( $C_2H_4$ ) currently used in the cooling fluids mixture. With the implementation of this project, there would be no need of importing ethylene ( $C_2H_4$ ), therefore transportation and associated processes on the supply chain will be avoided.

### **1.6.1 NATURAL GAS PIPELINE**

The 408 Km Natural Gas Pipeline transports natural gas produced in Block 56, Cusco, from Chiquintirca in Ayacucho, where it connects to TgP's gas pipeline, to Pampa Melchorita in Chincha, where the LNG Plant is built.

The gas pipeline was built conforming to international standards and national regulations. For the operation, corrosion control, gas pipeline integrity and monitoring, the gas pipeline incorporates in its design:

- A SCADA system (Supervisory Control and Data Acquisition) that allows remote control and operation of the gas pipeline. The SCADA controls the pressure, flow and temperature of the fluid at key locations and remotely operates valves and equipment to adjust operation parameters;
- Redundant communication systems to monitor and control pipeline operation in case of contingency situations. Communication is achieved primarily through fiber optic cable with radio and satellite backup;
- Cathodic protection system to prevent or reduce the corrosion ratio of the pipeline metal components;
- Pig launching and reception stations, and magnetic markers. These facilities are used for regular internal cleaning and for internal inspection for corrosion and damages inside the gas pipeline;
- Pressure control valves at key locations of the pipeline to control operating pressures;
- Geotechnical fiber optic cable for monitoring the pipeline stress due to landslides or creeping of terrain adjacent to the RoW;
- Other facilities, local measurement devices and heat generators to produce power required for the communication and cathodic protection system.

During the operating phase the two main activities of PLNG are the pipeline operation and facilities and RoW maintenance. During 2012, the pipeline operated for twelve months transporting a daily average between 551.68 and 622.89 MMSCFD of gas, with the exception of November when an average of 304.98 MMSCFD of gas was delivered to the Plant. During November, a general plant shutdown took place in order to make preventive and corrective maintenance to several plant components. The pipeline also transports gas for TgP with a daily average in 2012 between 138.72 and 247.93 MMSCFD of gas. The statistics as of February 2013 show that the amount of transported gas is within the ranges of gas transported during 2012.

Maintenance is an important activity during the pipeline operation phase. PLNG has 10 maintenance contractors. COGA is the main contractor and is responsible for maintenance of the RoW, surface facilities (valves, measuring stations, and pig stations), cathodic protection and IT. Other important contractors are: WESAC, responsible for the access road maintenance; ISI Mustang, responsible for the SCADA maintenance; Telvent, which provides software support for the SCADA; and Omnisens, which provides technical support and maintenance in the geotechnical monitoring. PLNG also has two implementing partners that execute biorestoration activities and help in social activities such as the participatory social and environmental monitoring program (PMSAP, by its initials in Spanish) and other projects.

The largest land stabilization work on the RoW during 2012 was carried out in KP 28. Gabions and surface and underground drainages were installed to stabilize the right of way and the adjacent hillside. The works were executed without incidents. The works were completed with ground recontouring and pasture seeding to seek a fast vegetation coverage recovery.

During the 2012-2013 rainy season, no significant ground instability in the RoW was recorded. The 2013 maintenance program calls for preventive maintenance of 200 km of RoW and access roads. Specific work plans will be drafted after the RoW inspection is completed at the end of the 2012-2013 rainy season and findings are classified and prioritized.

In compliance with Peruvian regulations and international standards, PLNG has developed a pipeline Integrity Management System (IMS). As part of its compliance activities, PLNG has submitted to OSINERGMIN the Annual Pipeline Maintenance and Integrity Management Plans.

IMS is a tool that prevents or minimizes environmental and social impacts since it helps to prevent contingency situations, such as pipeline ruptures and gas leaks, which can potentially cause fire or explosions. The IMS includes activities to monitor and control internal and external corrosion of the pipeline, leak detection, monitoring for damage caused by third parties or natural external causes, geotechnical monitoring, personnel training, and system's inspections and audits.

## **2.0 SOCIAL MANAGEMENT**

### **2.1 ORGANIZATION AND STAFFING**

PLNG Social Management team is fully established and fully functional. The number, quality, and experience of human resources at both the managerial and field execution levels show high standard levels. The social team is well-positioned within PLNG's general structure, with vast participation in the decision-making process.

### **2.2 SOCIAL KEY PERFORMANCE INDICATORS (KPIs)**

Table 2 lists the five social key performance indicators (KPIs) applicable to the project's operation phase, whereby overall compliance on social issues is assessed. The last column summarizes achievements reported by PLNG Semiannual Compliance Report for Second Half of 2012 period.

**Table 2** Social key performance indicators

	TOPIC	KPI	ACHIEVEMENTS
1.	<i>Grievances</i>	70% of grievances resolved within 90 days 90% of grievances resolved with 180 days	80 % resolved within 90 days 90 % resolved within 180 days
2.	<i>Stakeholder Engagement</i>	Number of ADI Communities visited in the reporting period	90 % compliance with SEP
3.	<i>Local Hiring</i>	Peruvian workforce employed as a percentage of total workforce Trend Analysis	100 % of hired workforce is from Chinchá and Cañete
4.	<i>Community Monitoring (PMSAP)</i>	30% of observations addressed during 30 days	100% observations raised were responded specifying the period when the required works will be conducted.
5.	<i>Fishermen Compensation</i>	% Projects or businesses in operation (survival rate) Trend Analysis	67.10% of businesses in operation. The most enduring are those implemented by associated fishermen

In the opinion of the IESMC team, the above set of social KPIs can be sharpened and completed to allow for a meaningful, thorough assessment of overall and program-specific performance.

## 2.3 SOCIAL PERFORMANCE

The social monitoring programs reviewed/discussed during the monitoring visit and their applicability are:

Program	Applicability
Stakeholder Engagement Program (SEP)	Plant and Pipeline
Grievance Management Program (GMP)	Plant and Pipeline
Participatory Social and Environmental Monitoring Program (PMSAP)	Plant and Pipeline
Fisherman Compensation Plan (FCP)	Plant
Pipeline Compensation Management Plan (PCMP)	Pipeline
Livelihood Restoration Program (LRP)	Plant and Pipeline
Influx Management Program - High Consequence Areas (IMP-HCA)	Plant and Pipeline
Others	Plant and Pipeline

Due to time constraints and priority topics agreed upon parties, the implementation and current results of Local Hiring and Local Purchasing programs were not reviewed. Both programs are applicable to the PLNG Plant and Pipeline.

### 2.3.1 STAKEHOLDER ENGAGEMENT PLAN (SEP)

#### Plant

Direct communication with stakeholders within the coastal area takes place in two Project field offices located in Chíncha and Cañete near the Melchorita Plant. The two offices are open three times per week. Information events with project stakeholders are carried out by the SEP management team in accordance with procedures and schedule approved.

During the second semester of 2012, the offices received a total of 750 visitors; 250 consultations were recorded at the Cañete Community Relations office and 500 at the Chíncha office. The majority of these visits are related to inquiries on job opportunities and the Fishermen Compensation Plan.

#### Pipeline

Direct communication with stakeholders affected by PLNG gas pipeline takes place in the two project field offices located in Huamanga and Huaytara, as well as through PLNG Community Relations Officers in their periodic visits to communities and locations along the RoW. Visit to the communities account for most of the face-to-face interaction with stakeholders. Along the gas pipeline, the SEP includes a target number of interactions to be achieved on a monthly basis during operations; the frequency of engagement is adjusted depending on the level of company activities, specific requests or needs from particular stakeholders, availability of new information, etc. The SEP addresses various topics such as: communications, operations and maintenance activities, environmental safety, land easement and others.

SEP activities are divided in two sectors, as follows:

- (1) *Sierra 1*: From KP 0 to KP 105 (Chiquintirca to Huaychao); and
- (2) *Sierra 2*: From KP-105 to KP-269

Both sectors present different challenges during the execution of the SEP. Sierra 1 has the challenge to deliver information and document requests associated with slow bio-restoration of high altitude lands affected by pipeline construction and maintenance activities. Sierra 2 has the challenge to reduce pressures for additional compensation, and to inform about the limitations for expansion of new settlements onto security areas around the pipeline RoW. These challenges have been identified by PLNG social management staff and are apparently being addressed in a way that is progressively moving PLNG from conflictive claims and de-facto situations to dialogue and negotiated solutions.

During the second half of 2012, 177 letters were received from stakeholders; only twelve of them were related to grievance management. Out of the sixty letters received at the end of the second semester of 2012, 27 (45%) of them were related to fisherman compensation.

PLNG SMS makes use of comprehensive planning tools, and a stakeholder interactions tracking system, which allow for quality control of planned versus completed activities. The SEP has integrated mechanisms to verify queries, through joint inspections with community representatives and local authorities along the RoW.

The SEP is carried out in accordance with planned strategies, procedures, and timelines.

### Risks

No significant risks were found in regard to stakeholders relationships. However, a deeper risk identification/assessment will be carried out by the IESMC during the 2014 monitoring visit once the communities/groups with complex issues can be visited.

### Recommendations

PLNG is managing its relationships with all project stakeholders, including those supporting claims on unattended or not fully compensated damages. No recommendations are needed at this point, except continue executing the dialogue and negotiated solution strategy.

## **2.3.2 GRIEVANCE MANAGEMENT PROGRAM (GMP)**

As part of the stakeholder engagement program since the construction phase, PLNG has established a Grievance Management Program (GMP). Received grievances are consolidated in a database and processed in accordance to procedures and KPIs agreed upon with lenders. Table 3 shows the classification of grievances being recorded by PLNG Grievance Management System.

**Table 3** Classification of grievances

<b>Nature of complaint</b>	<b>Description</b>
Land & Easement	Expectations on the possibility of renegotiation, on modifying existing agreements, grievances related to misunderstandings to the Land and Easement contracts and obligations.
Environmental and economic grievances:	Perceptions and concerns about dust control, impacts on camelids, concerns on potential damages to water bodies (lagoons, rivers, springs), concerns on damage to wetlands and grasslands.
Land and infrastructure Damages	Concerns and grievances related to potential damages to water irrigation channels, fences, wells, existing roads, crops, and cattle.
Operation & Maintenance:	Concerns regarding operation and maintenance activities, crossings of irrigation channels, material transportation and storage, transit of cattle, reinstatement, erosion, and land restoration.
Fishermen Compensation	Grievances related to Fishermen Compensation Plan, received from fishermen included or not in the Plan.

The system worked well during construction and is fully functional during the operations phase.

However, two shortages of the GMP have been identified:

- (1) The grievance system is not sufficiently known and used by the affected communities in the Sierra region, as reported by contractor Social Capital Group (SCG) in a recent survey carried out during the second semester of 2012. A continuous effort to disseminate the system is advisable; and
- (2) The time required to resolve grievances is taking longer than the established goal (180 days); long delays have occurred for the solution of claims presented by Anchihuay, Chiquintirca, Huaychao, and Vinchos communities. In general, delays are due to time required for grievance evaluation, institutional diligences and negotiations, as it is the case of ongoing claims presented by the Vinchos community and recently formed associations, related to demands for alleged environmental impacts, additional easement and other compensations.

PLNG reported a continuous dialogue and better relationships with leaders from the Vinchos community with encouraging progress toward reaching agreements with this community.

### Risk-based Classification of Grievances

As per the lender's requests, two categories have been established allowing PLNG to take a proactive approach to identify potential issues along the RoW, prioritize the grievances, prevent potential conflicts, and manage all the grievances in a timely manner:

1. *Minor Grievances*: Having a low to moderate risk, and a low probability of becoming a conflict or stoppage; and
2. *Grievances*: Having a considerable risk, and a high probability to become a conflict or stoppage if unsolved.

During 2012, 83 grievances were placed, 30 of which originated from the *Virgen de Cocharcas de Cochabamba* community related to alleged infrastructure damages and landslide (KP-28) during the rainy season. By February 2013, PLNG reported that seventeen of them were resolved, while five are still in process. In particular, PLNG has placed great emphasis on erosion control along the pipeline access road, applying procedures recommended by international standards.

During the July-December 2012 period, 24 grievances were received; one of them related to fisherman compensation non-compliance with agreement, and the other 23 related to land and infrastructure damage. All of these grievances have been classified as minor.

During the 1<sup>st</sup> quarter of 2013, five complaints have been placed, one of them arising, once again, from the *Virgen de Cocharcas de Cochabamba* community.

Other grievances are related to compacted soil and sanding of beaches located nearby the Melchorita Plant marine terminal and restricted marine zone. Almost half of the complaints received since July 2012 has taken more than 180 days to be resolved.

PLNG is investigating received grievances to address and close them within the approved procedures.

### Stoppages

PLNG faced two stoppages during the second semester of 2012:

- (1) Fifteen members of *Virgen de Cocharcas de Cochabamba* community, blocked the RoW with a claim about alleged damages to their lands during pipeline construction; and
- (2) A small group of people from San Luis de Pichá, an annex of Vinchos community, blocked the RoW requesting renegotiation of compensation agreements, stop exports of natural gas and maintenance of public roads.

Both stoppages were resolved on the same day of their occurrence.

### Grievances

The "Frente de Defensa de Comunidades Afectadas por Camisea" (FREDCOM-AF CAMISEA), an organization that claims to represent the rural communities affected by the Camisea pipelines, has

demanded renegotiation of all easement contracts. According to PLNG, FREDCOM-AF CAMISEA is an organization which does not represent any PERU LNG affected communities.

Management of complaints and requests made by FREDCOM-AF CAMISEA has proved to be particularly difficult. Vinchos has been affected not only by the PLNG gas pipeline, re-composition of the RoW, a valve, and maintenance of access roads, but also by TgP pipeline. As a result six Vinchos' annexes with about 100 affected possessors are pressing growing demands for compensation. Since the agenda could not include a visit/interview of Vinchos community and leaders, the IESC could not verify the validity, nature, and scope of demands or if these demands are based in subjective/uninformed community perceptions, and/or vested interest on furthering FREDCOM's wider agenda.

PLNG has engaged the Vinchos community in conversations for a peaceful resolution of grievances and demands. Periodic meetings are held between PLNG and community representatives.

Reinstatement for 300 m of the RoW in Accopampa Annex in Vinchos is pending.

#### Old Open Complaints

There are twelve and fifteen complaints pending to be solved, from 2010 and 2011, respectively. There were many factors that contributed to the lack of resolution of these cases, such as complainants in Anchiuay who moved out of the area.

PLNG should close old grievances placed by complainants that the Company has been unable to locate, keeping records that document efforts made to contact them.

#### Recommendations

No major recommendations are needed in regard to the Grievance Management Program other than:

1. Continue the efforts to disseminate the system;
2. Continue executing the dialogue and negotiated solution strategy with Vinchos and its annexes; and
3. Close old grievances placed by complainants that the Company has been unable to locate, keeping records to document efforts made to contact them.

### **2.3.3 PARTICIPATORY ENVIRONMENTAL AND SOCIAL MONITORING PROGRAM – (PMSAP)**

#### **Pipeline**

An integral part of PLNG monitoring is the PMSAP, through which community members are engaged in the inspection process and report on environmental and social issues. This program has been successfully implemented since construction. For the operation phase, the PMSAP is designed to address social and environmental aspects associated with the pipeline operations and maintenance over four territorial zones (Huaytara, Ayacucho, San Miguel, and Ica).



Project activities are conducted with the support of NGO *Pro naturaleza* in coordination with the PLNG's Environment team. The PMSAP area covers 56 communities and localities, with 37 community monitors participating in the second semester of 2012.

The PMSAP continued monitoring activities along the RoW. As part of the integrated monitoring approach, the social information collected through the application of social monitoring forms has been systematized in a database format. Social monitoring of maintenance works is conducted at different work sections. The majority of the 47 observations made by community monitors are related to damaged signs and erosion control devices.

The Environmental team of the IESMC interviewed two monitors during the field visit. The monitors explained the work they performed, showed the data sheet they fill and explained the process by which they relay the information to the communities they represent. From the interviews, the community monitors seemed well trained and knowledgeable of their duties and responsibilities. The environmental team also had the chance to use the summary of findings of the monitoring reports. They proved especially helpful for erosion control issues. The social team was not able to review the PMSAP reports of the 2012 monitoring campaigns, nor had the opportunity to interview community monitors during the April 2013 field monitoring visit. Therefore, an assessment of the effectiveness of the monitor feedback to their home communities could not be assessed.

#### Recommendations

No recommendations on the PMSAP are needed for this monitoring report. For the 2014 field monitoring visit, the IESMC will assess effectiveness of feedback to communities of PMSAP findings and remedial actions taken by PLNG.

### **2.3.4 FISHERMEN'S COMPENSATION MANAGEMENT PLAN (FCMP)**

The FCMP executed by PLNG provides compensation to fishermen associations and individual fishermen through projects to create a continuous source of alternative income, as well as direct social assistance to individual fishermen. The FCMP was developed during the construction phase and continued through the first 3 years of the operation phase. A number of 838 artisanal fisherman participated in the compensation plan.

#### Update on results of the FCMP during the second semester of 2012

- The last ten Fishermen Associations have signed the compensation agreement, completing 100% of the fishermen associations' agreements.
- All associations except *Herbay* have received the compensation. The *Herbay* association, which has 92 associated fishermen, has not yet reached a final decision about the business that the association will develop with PLNG compensation resources. PLNG is currently engaged in dialogues with the *Herbay* Fishermen Association. The company has made clear that renegotiation is not an option and expects to disburse the compensation by the end of year 2013.
- 285 independent fishermen have signed agreements during the second semester of 2012. So far, 723 independent fishermen (95% of the total number) have signed agreements and received compensation. Only 21 independent fishermen are pending to sign agreements as

PLNG has been unable to reach a compensation amount due to expectations very well above compensations negotiated with the rest of fishermen.

- 707 businesses have been implemented, most of them related to complementary income generation activities already carried out prior to compensation or to alternative economic activities developed by the fishermen's close relatives.
- 20% of all implemented businesses were not in operation by August 2011. Only 90 vehicles from the 220 vehicles acquired with compensation resources are still working. The rest were sold.
- 569 businesses have received technical assistance from PLNG, and 466 have already signed the Reception and Satisfaction Act.

PLNG is committed to follow good practices while negotiating with the remaining independent fishermen. The Fishermen's Compensation budget for 2013 is about US\$ 800,000.

#### Technical Assistance Program to Fishermen

The Technical Assistance Programs is structured by phases, as follows:

Phases I and II: assistance to 106 agriculture and livestock businesses (completed);

Phases III, IV and V: assistance to 463 commercial businesses (in process); and

Phase VI: assistance to 138 transport-related businesses (pending).

Phases I through V are executed by *Promotora de Obras Sociales e Instrucción Popular* (PROSIP), which oversees two technical institutions: Instituto Rural Valle Grande (Valle Grande) and Instituto Superior Tecnológico Privado Condoray (Condoray).

569 businesses have benefitted from this assistance, as follows:

- (1) 106 agriculture and livestock businesses benefited from technical assistance provided by Valle Grande (phases I and II); and
- (2) 463 commercial and service businesses received technical assistance from Condoray.

Valle Grande has already completed the technical assistance to agriculture and livestock businesses. Results are compiled in Valle Grande Final Report presented in June 2012.

Condoray started the technical assistance program in August 2012 compensating fishermen from *Chincha* and *Cañete*; and has already completed phases III and IV for the first 360 commercial and service businesses. Condoray also gives technical assistance to fishermen associations except to *Herbay*. The results of Condoray phases II through IV are compiled in a Final Report presented in 2013. A report on Phase V is schedule for delivery by April 30, 2013.

Most of the already assisted businesses are new, basic and informal. Although Condoray reports positive outcomes for many of them, it is concerned about the sustainability of some of the businesses. Lenders' representatives and the IESMC team suggested to PLNG that Condoray: (1) identifies the weakest business facing a high risk of failure; (2) recommend strategies/actions to improve their chance of success and (3) include specific recommendations of the respective business profile to be delivered to PLNG.

Phase VI for transport-related businesses will be executed by local company ARIFE. The final report is expected by the first quarter of 2014.

### Risks

No major risks were identified on the FCMP and the complementary Technical Assistance Program. The FCMP is near completion and the Technical Assistance Program is well advanced.

All activities pending for completion have been clearly identified by PLNG and scheduled for completion between March 2013 and March 2014, and they are: compensation and business development with Herbay and the 21 individual fishermen pending to sign; and completion of phase IV, V and VI of the technical assistance program.

### Recommendations

1. Expedite the process to establish a business with compensation to be received by Herbay Fishermen Association
2. Identify the weakest business being attended by Condoray that face a high risk of failure; recommend strategies/actions to improve their chance of success and
3. Include specific recommendations the respective business profile to be delivered to PLNG.

## **2.3.5 PIPELINE COMPENSATION MANAGEMENT PLAN (PCMP)**

PLNG pipeline passes through the following 22 Districts:

REGION AND NUMBER OF DISTRICTS	DISTRICTS
9 districts in Ayacucho	Paras, Socos, Vinchos, Tambillo, Accocro, Chiara, Acos, Vinchos, San Miguel and Anco)
4 districts in Huancavelica	Ayaví, Tambo, Huaytará and Pilpichaca
8 districts in Ica:	Huancano, Humay, Independencia – in the province of Pisco and El Carmen, Alto Laran, Chincha Alta, Pueblo Nuevo and Grocio Prado – in the province of Chincha
1 district in Lima	Cañete.

All land required for the Pipeline RoW has been acquired by the Project. By the end of 2012, a total of 2,541 easement contracts have been obtained. Contracts call for payment of compensation at three milestones: at easement signature, prior to RoW grading, and at closure of RoW with owners' approval of reclaimed activities.

### PCMP Status:

- 100% of Easement contracts with individual landowners have been negotiated and signed;
- 2,504 RoW of signed Easement Contracts with first payment executed; and
- Three third payments are pending (two in Vinchos).

There are 13 RoW Legal Easements established. In accordance with applicable regulations, PLNG continues with the judiciary processes to deposit all the outstanding payments in escrow accounts for collection by the possessors. Ten (10) out of the 13 established RoW Legal Easements are on State land, with only 3 impositions on individual owners.

### Risks

No significant risks related to the PCMP were identified.

### **2.3.6 LIVELIHOOD RESTORATION PROGRAM (LRP)**

In March 2011, monitoring framework and evaluation of the PCMP along with the Livelihood Reestablishment Program was agreed upon with the Environmental and Social (E&S) Lender representatives, including indicators for a 36-month results' monitoring of the LRP for affected communities/individuals. This monitoring program is important for a comprehensive picture of the results of the PCMP.

This monitoring will provide the opportunity to:

- (1) Verify that objectives have been achieved;
- (2) Document satisfaction levels from people affected by the compensation process;
- (3) Identify gaps; and
- (4) Implement gap-filling measures as needed.

PLNG contracted SCG to carry out the LRP. For the first monitoring report, SCG conducted interviews to 490 households, representing 39% of all affected families, in both, *Sierra* and *Costa*.

In the coastal area, SCG is monitoring the results of the technical assistance program provided by Valle Grande in Chincha and *Cañete* (improvement and strengthening of 106 livestock and agriculture businesses implemented by compensated fishermen) and by Condoray (463 commercial and service businesses implemented by compensated fishermen).

In the Sierra region, SCG is monitoring the results of the Livelihood Improvement Program for 13 communities and 150 families located in the Districts of Vinchos, Socos, Pilpichaca, Huaytara and Ayavi, carried out in 2010 and 2011.

SCG's first monitoring report shows an overall improvement in living conditions of affected interviewee's households, good use of compensation resources (house improvements, livestock, productive activities) and appreciation for employment opportunities. SCG also reported that the use of compensation resources and diversification of income-generation activities has improved their lives, in conjunction with governmental programs carried out in Sierra and Coast regions.

Conversely, the report also shows that a high number of interviewees reported low-to-mid levels of satisfaction with the compensation received when compared with perceived affectation. Satisfaction levels are particularly low among fishermen, with only 26% of them declaring to be satisfied with the compensation. However, 50% believe that the business development program has improved their livelihoods.

According to PLNG social staff, this could be the result of previous delays in providing technical assistance to fishermen businesses, recent events related to erosion in pipeline access roads and parts of the RoW itself, and to expectations for additional compensation. Nevertheless, low satisfaction levels imply social risks that need to be carefully managed.

Although SCG's first report provides interesting socio-economic data and perception of interviewed families, it does not provide clear conclusions about whether the impacts directly attributable to the

PLNG project have been mitigated and whether affected livelihoods have been restored, specifically in the case of the most affected and most vulnerable group of the population. The SCG reports do not provide information disaggregated by annexes, which makes difficult to conclude whether the directly affected areas are better or worse off. During the visit, lenders, Peru LNG and the SCG agreed on the next report presenting disaggregated data.

### Risks

Low levels of satisfaction expressed by a high number of interviewees imply moderated but important to consider social risks that need to be carefully assessed and managed.

### Recommendations

Lenders and the IESMC team proposed recommendations to strengthen data collection and analysis in order to get decisive results. Therefore, it is recommended that SCG:

- Consider geographic references to clearly identify areas of concern;
- Break down community data to reflect the situation of the community “Annexes”;
- Provide clear conclusions about impacts on income and on livelihood, and the effect of the compensations, particularly for those communities considered vulnerable according to the Rural Andean Community Management Strategy;
- Cross check and compare peoples’ perceptions with objective data/evidence of actions taken by PLNG;
- Do a comparative analysis of collected data and the project socio-economic database;
- Determine if the land has been restored and if people are being able to cultivate again; and
- Provide clear conclusions supported by empirical evidence and livelihood restoration data. SCG’s second report is expected to present results as follows:
  - Communities/*Annexes*/individuals with clear evidences of livelihood restoration (these cases should be closed and no need for further action/monitoring); and
  - Communities/*Annexes*/individuals having persistent difficulties for livelihood recovery (e.g. high altitude areas with slow re-vegetation process); pending to close cases should be reported by the Livelihood Restoration Completion Report together with the respective corrective action plan.

SCG’s Final Report on Livelihood Restoration is expected by the end of 2013.

### Livelihood Completion Report

The LRP will be closed when a completion audit demonstrates that livelihoods have been fully restored. This audit should be undertaken by an independent third party; it will rely on data generated by the monitoring program and should provide evidences of livelihood restoration along the entire RoW. The Completion Report is expected by mid-2014 (36 months after the closure of pipeline compensation activities).

## **2.3.7 INFLUX MANAGEMENT PLAN (IMP) AND HIGH CONSEQUENCE AREAS (HCA)**

### **Plant and Pipeline**

The IMP is implemented by PLNG to prevent potential settlement increase in areas near the LNG Plant and with special attention on HCA along the pipeline corridor.

On a regular basis, PLNG monitors the areas near the LNG Plant and along the pipeline corridor in order to detect the presence and/or growth of settlements that might encroach upon the LNG Plant buffer zone, the pipeline RoW and other project-associated facilities. The results of this monitoring program are reported to Peruvian authorities such as COFOPRI, the Ministry of Agriculture, and related municipal authorities.

PLNG carefully monitors HCA along the pipeline RoW during the Project's operations. HCA are defined in accordance with Supreme Decree N° 015-2006-EM, Environmental Regulation for Hydrocarbon Activities, and Supreme Decree N° 081-2007-EM, Hydrocarbon Transportation by Pipeline Regulations.

In the coastal area, a key challenge faced by the Project is the rapid growth of informal new settlements representing a still moderate but growing risk for the LNG Plant in Pampa Melchorita. Developers of a new settlement called "*Asociación de Propietarios Centro Poblado Nuevo Cañete*" (APCPNC), located south of the plant buffer zone continue marking plots and raising constructions. Other new settlements known as "*El Trébol del Pacífico*" and "*Brisas de Concón*" are also erecting new concrete and wooden houses.

Since January 2013, consultant ERM is carrying out an update of the Stakeholders database to include the new settlements nearby the Plant. ERM's report is due in April 2013, therefore will only be available for the next annual IESMC review.

### HCA

Since pipeline construction, new and rapidly growing settlements have sprawled just outside the pipeline buffer zone, in Chinchá (between KP 376+800 and KP 380+600) generating a HCA. This urban expansion is documented by PLNG in satellite images and is presented in Annex II.

Currently, there are two HCA, both in Chinchá, as follows:

- 1) Urban encroachment located between KP 376+800 and KP 380+600 inhabited by hundreds of families; and
- 2) Encroachment on KP 365 with about 25 uninhabited shacks.

The Chinchá settlements at *KP376+800 and KP 380+600* were initially established by the Chinchá Mayor in lands that belong to the Ministry of Agriculture, acting under a decree issued by the Peruvian government to attend the disastrous consequences of the 2007 earthquake that destroyed/damaged thousands of properties in coastal areas. As result of this and also of opportunistic housing developers, an area which was not inhabited in 2005, today has hundreds of houses; some of the new houses have formal title, while others lack formal land tenure rights. The settlement is divided into three already established neighborhoods, some of them with subsequent developments known as "*ampliaciones*". These are:

- 1) *Señor de los Milagros* with 6 neighborhoods;

- 2) *Satélite Primavera* with 2 neighborhoods; and
- 3) *Quince de Agosto* with 1 neighborhood.

In order to prevent additional encroachment and avoid/reduce safety risks, OSINERGMIN started a dialogue with the town's major and other local leaders aimed at defining norms for housing development. Dwellers from *15 de Agosto* and *Señor de Los Milagros* settlements moved out of the RoW and relocated to another area of the same neighborhood, thus clearing the pipeline buffer zone, for the most part. PLNG reported that the process was voluntary. It is important that PLNG fully documents this process and provides evidence of voluntary relocation and satisfactory results.

Likewise, PLNG has established dialogue with *Satélite Primavera*. However, this settlement is near a "Class Three" pipeline, which has a greater thickness, allowing for closeness of human settlements with little or no risks.

#### Actions Taken by PLNG

PLNG is fully aware of the risks posed by new settlements that are rapidly expanding nearby the LNG Plant buffer zone and along the gas pipeline. As a result, PLNG is diligently working with communities and local authorities to preserve the RoW from encroachments.

Ongoing actions:

- Periodic monitoring of new settlements;
- Collection and evaluation of satellite images;
- Increased frequency of monitoring in HCAs;
- Meetings with COFOPRI (Governmental agency responsible of issuing property deeds), municipal authorities and OSINERGMIN to coordinate activities, responsibilities and land use norms in these areas;
- Assistance to local authorities and families to relocate to neighboring areas outside the pipeline security zone;
- Weekly patrolling of the area; and
- Safety awareness meetings with community leaders, held by the HS team during operations and maintenance activities.

PLNG is carrying out constant monitoring and coordination with relevant authorities and communities to guarantee the security of the gas pipeline and local residents while avoiding conflicts with neighboring inhabitants and local governments.

#### Risks

In the coastal area, no significant incidents have been registered in the Plant's buffer zone, except damages caused to a buffer zone fence. No major risks have been identified.

The Influx Management Plan is being implemented in accordance with the procedures established for this plan and is aimed at achieving its objectives.

The rapid and uncontrolled expansion of new settlements (both, formal and informal) near the security zone of the pipeline points to low-to-moderate social risks that require careful monitoring, assessment and managing through existent procedures, such as:

- Influx Management Procedure -SOC-000-PRG-1030;
- Stakeholder Engagement Program -SOC-000-PRG-1010; and
- Pipeline Contingency Plan (EHS-000-PLN-1110).

#### Recommendations

1. Seek proactive agreements with authorities not only to react to the growth of new settlements but especially to prevent and discourage new construction in areas within the pipeline security zone (see the IMP);
2. Increase the frequency and quality of community safety awareness meetings; engage the social team in relationships, negotiations and in safety training; and
3. It is important that PLNG fully documents the process by which dwellers from the Señor de Los Milagros and Quince de Agosto moved out of the RoW and provides evidence of the satisfactory results obtained.

### **2.3.8 LOCAL HIRING & LOCAL PURCHASING MANAGEMENT PLAN**

Due to time constraints and priorities agreed among parties, the local hiring and purchasing management programs could not be examined in detail by the IESMC during the April 2013 visit. A follow-up on both programs is programmed for the 2014 Independent Monitoring Field Visit.

The Local Hiring Program governs the hiring processes of PLNG (including contractors) in the Project's direct area of influence. The program was designed to maximize job opportunities in and around affected communities during the construction phase. As expected, during the operations phase the need to hire local workforce has diminished since only a small number of qualified operational staff and maintenance contractors are needed.

Even though workforce demand during the operation phase is limited, some local workforce still continues to be used mainly in pipeline and surface installations maintenance and LNG Plant maintenance. On the second semester of 2012, PLNG reported 304 workers, mainly from Ayacucho, Huancavelica, and Ica.

PLNG social team is aware of the need and opportunity to develop a more proactive approach to local hiring that maximizes for the local population, especially in the project most affected areas.

Local hiring is performed in compliance with local labor regulations and approved procedures.

The Local Purchasing Program governs the purchasing processes of PLNG, Contractor and Subcontractor in the Project's direct area of influence, as outlined in the Project's ESIA's. This program establishes mechanisms and procedures for local purchasing in order to maximize benefits to the local population and minimize negative impacts. As the Project started the operation phase, the needs for local goods and services have greatly diminished. However, long-term demands of the operation phase can generate economic opportunities for local firms that the scale and speed of the construction phase did not allow.



PLNG social team is aware of the need to promote a more proactive approach that secures the procurement of local goods and services to positively contribute to sustainable local development.

#### Risks

No social issues or conflicts regarding local workforce were identified, except community requests to PLNG to increase local hiring for pipeline maintenance and operation. No risks associated to local hiring were found.

#### Recommendations

1. Adopt a more proactive approach to local hiring and local purchasing, including permanent and temporary jobs and purchases, training or other technical assistance to local providers.

### **2.3.9 ADDITIONALITY PROGRAMS – SOCIAL INVESTMENT PROGRAM (SIP)**

The main purpose of the Social Investment Plan (SIP) is to establish guidelines for the implementation of projects to strengthen local skills and foster community development within the DAI of PLNG, in keeping with the company's objectives and with a focus on sustainability. The program encompasses both coastal and highland areas.

For the operation phase, the SIP has a 2.5 million dollars annual budget. With these resources plus resources placed by governmental and non-governmental partners, PLNG voluntarily invest in various socioeconomic fields such as agribusiness with grape producers, assistance to fishermen with FONDEPES, entrepreneurial fairs, marketing of Camelids rearing and products in Ayacucho, health campaigns, etc.

Voluntary social investments are still partially driven by commitments made during the construction phase, by community demands and by programs/activities of interest of potential investment allies.

Although social investment activities are well received by beneficiaries and partners, they are not based on strategic planning or vulnerability analysis nor are they developed in coordination with social impacts management, social and environmental monitoring or compensation programs.

#### **Recommendation**

1. PLNG should review its social investment program to reflect and respond to three strategic lines:
  - Investment programs in most vulnerable Communities/Annexes within the project Direct Area of Influence, especially along the pipeline, as characterized by the Andean Strategy and in connection with the vulnerability analysis being carried out by SCG as part of the Livelihood Monitoring;
  - Investment programs for affected family units identified by Condoray and Valle Grande as requiring additional support for complementary income-generation activities; and
  - Investment programs in Communities/Annexes which depend on pasture areas affected by the gas pipeline in high altitude areas with slow re-vegetation and bio-restoration.

### 2.3.10 SOCIAL ISSUES REGARDING BIO-RESTORATION ALONG THE PIPELINE

The objectives of the Bio restoration Program are to restore ecological conditions and vegetation coverage to those similar to pre-construction. This program is further discussed on Section 3.5.3. The PLNG pipeline has experienced slower than expected vegetation recovery especially where some or all the following conditions exist: high altitude areas, low rainfall, shallow soil, or higher rockiness due to excavations during construction activities. PLNG identified 65 km of the RoW where the November 2012-February 2013 Bio-restoration Campaign targeted lands that encompass the following 16 communities:

Chiquintirca	Anchihuay
Cochas	Socos
Santa Magdalena	Yanapiruro-Ichubamba
Toccyascca	Paucho
Vinchos	Paccha
Rosaspampa- Churia	Llillinta -Picchahuasi
Pillpichaca	Santa Rosa de Tambo
Huaytara	Ayavi

PLNG and the communities have signed easement agreements according to which affected lands along the RoW will in 3 years have similar productive conditions as of before the construction of the pipeline. While PLNG has been able to comply with this commitment in most of the communities affected by the gas pipeline, in some sectors located in high altitude areas, the current vegetation cover is significantly below the surrounding areas not affected by pipeline construction. Even though pastures are slowly colonizing de RoW, native species recovery will take more than the 3 years period initially expected to reach pre-construction conditions.

Slower than expected bio-restoration in these areas might affect the livelihoods of Andean community annexes, especially of those whose subsistence depends on high altitude pasture for grazing camelids (Llama and Alpaca). Although apparently the amount of affected land in each community is small in proportion to their total land holding, at the "Anexo" level a thorough assessment and firm conclusions on livelihood affectation needs to be based on hard data such as land affected, land available, size of the herd, carrying capacity of pasture, number of families that depend on camelids rearing etc. This data should be disaggregated by Anexo.

As an illustration, Appendix III presents pictures taken by the IESMC team showing the current vegetation cover status of visited trenches of the RoW in the community of Huairacasa.

PLNG's Bio-Restoration and Social work teams are fully aware of this challenge. The company has consulted experts, applied diverse innovative re-vegetation technologies, and is making every possible effort to expedite results.

As requested by the Lenders at the beginning of 2013, PLNG has contracted objective livelihood monitoring services to be carried out by SCG. The results of this monitoring program/service will provide information on whether or not the slow performance of re-vegetation and bio-restoration in high altitude lands is affecting the livelihood of the communities around these areas.

SCG has already issued a first report on Livelihood Restoration Program, considered by the Lenders and the IESMC team as not conclusive. The second and final Livelihood Monitoring Report is scheduled for May 2013. Section 3.2.6 presents the recommendations made by Lenders and the IESMC to SCG to improve the quality and sharpen the conclusions of the second monitoring report.

During the second semester of 2013, PLNG Bio-Restoration Team will review the new re-vegetation strategies carried out from November 2012 to February 2013. The IESMC team recommends involvement of the social team in this evaluation.

#### Challenges and Risks

Since re-vegetation and bio-restoration processes in high altitude areas has a slow performance (slower than expected), it is recommended that PLNG develops a proactive approach recognizing both, challenges and risks, and if necessary, provides additional assistance to affected communities as to reduce potential impacts on their livelihoods.

The IESMC team concludes that the risks associated with the slow re-vegetation/bio-restoration processes in high altitude areas are considered low risk level; i.e. affected communities losing their trust in PLNG, adopting conflictive positions or increasing pressure on monetary claims. Related risks can be further refined and categorized once objective, hard data on livelihood affectation is available from the upcoming monitoring report. Risks can also be offset by technical support to improve existent community productive systems as PLNG has been doing.

Based on field evidence and interviewed community members, who expressed confidence and patience while hopping for good re-vegetation results, risks identified seem to be low and manageable mainly through PLNG good stakeholders' relationships, communications strategies and proved commitment to avoid, reduce project environmental and social impacts.

#### Recommendations

1. Recognition of challenges and risks derived from slow bio-restoration in high altitude areas;
2. Objective identification and mapping of lands that will not be recovered within the 3 years period specified in easement agreements;
3. Specify possible recovery timeframe;
4. Proactive communication with affected communities on status, results and possible timeline for bio-restoration;
5. Identification and assessment of livelihood affectation in highly vulnerable communities;
6. Target affected communities for social investments in accordance with affectation and vulnerability analysis;
7. Involvement of the social team in the bio-restoration evaluation process to be carried out during the second semester of 2012; and
8. Scientific, interdisciplinary close monitoring of critical areas until recovery.

The IESMC team emphasizes that visiting the most critical areas and vulnerable communities to follow up on the evolution of bio-restoration in high altitude lands affected by the gas pipeline is a high priority for the 2014 monitoring.

## 2.4 SOCIAL MANAGEMENT SYSTEM

The Social Management System (SMS) is fully operational. It focuses on the strategies: Stakeholder Engagement, Compensations and Social Investment. The strategies are progressing positively, with some incidents and challenges in the area of compensations, currently in process of being solved.

Social programs for the operations phase are about to complete two years in execution with lessons learned and adjustment mechanisms embedded in the system. The system integrates risk identification; assessment and management; roles and responsibilities; and document control and records.

In general, risk analysis and prioritization of actions/topics are integrated to the ESHS-MS, based on assessment of probability and frequency. Proactive monitoring and integrity of the Management System is one of the pillars to secure sustainable development, compliance, stakeholder participation, and social license. The PLNG ESHS-MS shows good levels of integration between environmental and social areas with weekly meetings for information exchange, coordination and joint planning. PLNG has an established record of prompt and proper response to various auditing and monitoring reports as well as lender's requirements. Responses and corrective actions are fully documented and reported in 2012 Semiannual Compliance Reports.

The ESHS-MS can benefit from improving the integration between company areas (e.g. interdisciplinary identification and mapping of common entry points and cross-discipline converging topics). Bio-restoration of high altitude sections within the right-of-way (RoW) and erosion control are some of the key areas that require joint planning/management by the technical, environmental, and social staff. Integration between areas in decision-making and risk assessment can be achieved through mechanisms such as the implementation of a High-Level Management Committee.

Although the overall performance of the SMS is adequate, the system lacks some basic tools such as an annual action plan and integrated schedule for stakeholder engagement, periodic assessments of overall performance, convergence between social investments, impact management, and conflict management and sharpened Key Performance Indicators.

IESMC has identified potential improvements for the SMS in the following areas:

- Better integration between company areas (e.g. interdisciplinary identification and mapping of common entry points, and cross-discipline converging topics such as bio-restoration of high-altitude lands and erosion control);
- Developing strategic planning tools such as annual plans and schedules;
- Risk assessment;
- Integration of social investment, impact management, and conflict management programs;
- Periodic overall performance; and
- Review, adjustment and completion of social KPIs.

PLNG Social team is aware of the limitations and opportunities for improvement and by the months of October-November of 2013 plans to hold meetings aimed at reviewing its overall performance with subsequent adjustments to the SMS, as needed.

The IESMC positively observes the experience and dedication of PLNG social staff to project impact management and fulfillments of commitments agreed upon with stakeholders. This positive observation needs to be considered as the backdrop to all of the IESMC sector-specific findings mentioned in this report.

## 3.0 ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT

### 3.1 ORGANIZATION AND STAFFING

PLNG EHS Management team is fully established and fully functional. The number, quality, and experience of human resources at both the managerial and field execution levels show high standard levels. The EHS team is well-positioned within PLNG's general structure, with vast participation in the decision-making process.

PLNG EHS team is aware of the challenges and opportunities for improving the project performance. Annually the team hold meetings aimed at reviewing its overall performance with subsequent adjustments to the program, as needed.

The IESMC positively observes the experience and dedication of PLNG EHS staff to project impact management and fulfillments of commitments agreed upon with local and national and the lenders. The team shows initiative to solve the challenges that arise in such a complex project.

### 3.2 HEALTH AND SAFETY (H&S) KEY PERFORMANCE INDICATORS

Table 4 lists four H&S key performance indicators (KPIs) applicable to the project's operation phase. The last column summarizes achievements reported by PLNG Semiannual Compliance Report for the January to June 2012 and the July - December 2012 period.

**Table 4** PLNG 2012 Health and Safety KPI

	TOPIC	KPI	ACHIEVEMENTS
1.	<i>Lost Time Incident Rate</i>	<0.25	0
2.	<i>Reportable Incident Rate</i>	<1.25	0
3.	<i>EHS Training</i>	Trend	1894

### 3.3 HEALTH AND SAFETY (H&S) PERFORMANCE

This section evaluates and summarizes the Project's compliance with the IFC Performance Standards (PS) on Environmental and Social Sustainability, with focus on IFC PS 4, Community, Health, Safety and Security; national laws and regulations; and programs and procedures on occupational H&S of the PLNG's ESHS-MS. The H&S procedures and programs are applicable to the PLNG Plant and to the Pipeline. General subjects applicable to the Plant and the Pipeline are first described with following those specifically applicable to the Plant and then to the Pipeline.

During the field visit on April 8 – 10, 2013 and by reviewing H&S documentation, the IESMC team observed overall compliance of the H&S requirements, and findings are summarized in the following table:

Reviewed Item	Comment
PPE (Personal Protective Equipment) use	During the field visit, it was observed that all staff and personnel use the appropriate PPE such as hardhat, flame retardant clothes, goggles, ear protection, steel-toed shoes, and leather gloves on work activities.
Melchorita Plant's Risk Assessment Study	<p>The plant's Risk Assessment Study was performed by the consulting company Inspectra, was submitted to OSINERGMIN on July 17<sup>th</sup>, 2012 and is currently under evaluation. The two key items of this study are:</p> <ul style="list-style-type: none"> <li>➤ Fuel gas dispersion map: In the case of gas leakage, this map shows that the LEL (Low Explosive Limit) is within the Plant's boundaries. The worst-case scenario on the Panamerican highway shows that the gas concentration would be 50% under LEL.</li> <li>➤ Worst-case scenario of fire and explosion, radiation curves and shock waves are within the Plant's boundaries and will not affect pedestrians on the Panamerican highway, neighboring communities or camps in the Plant. Since the control room would be within the risk zone, it was designed with a ground barrier for its protection.</li> </ul>
Management of Change (MoC)	It is stated on the ESHS-MS that all changes may generate new risks, which must be assessed and controlled through the MOC's procedures. All areas within the organization participate in this process by evaluating that appropriate assessments have been performed and that all control measures are in place. Moreover, a safety audit is performed prior the change. An opportunity for improvement for this procedure is to incorporate a representative from community relations to identify if there are new information, consultation or communication needs associated with the proposed change. The used of the MoC procedure was verified for the sodium hypochlorite injection project at the sea water intake point. Initial design called for the control of marine species fouling in the pump filters through to use the biocide effect of the materials used (copper composite); however, since fouling was higher than expected putting water intake at risk, decision has been made to use chlorine as biocide.
Committees and Subcommittees	COLP's workers and subcontractors have safety committees and subcommittees; or workers' representatives (in the case that the number of workers is not enough to form a committee) as per national regulations. Committees evaluate the safety performance of activities and follow up on accidents, if any. COLP carries out monthly meetings with the representatives of the contractors to evaluate safety performance, environmental issues and to improve safety awareness within the employees.
Process Risk Assessment	During 2012, the Process Hazard Assessment has evaluated 7 process units. The rest of the process units will be evaluated during 2013. The purpose of this activity is to confirm and update the risk assessment made for the Plant design under current process and operational conditions. The outcome of this evaluation may result in the implementation of additional to existing control measures to reduce risks, as it is established by ESHS-MS.
	All law requirements and legal regulations applicable to the Plant have been identified and an analysis conducted to determine how each of the requirements applies to the different units of the Plant and their status of compliance. In the last years, a large number of regulations have been enacted; therefore, PLNG regularly updates the compliance matrix and implements the changes required by regulations.
Job Safety Analysis (JSA)	<p>JSA is one of the main tools used to reduce accidents in maintenance activities. All work procedures are described systematically in order to provide a safe guide to the worker and to avoid potential injuries. They are classified as low and high risk work. Work activities involving electrical circuits, confined spaces, excavations, suspended loads and open flame works are classified high risk level</p> <p>In 2011, a JSA Committee was created. Moreover, audits are performed to frequently evaluate the appropriate use of the JSA.</p>
Watch Observation Program	The Watch program was implemented in order to register worker's safe and unsafe acts. This program promotes worker safety awareness and reporting of good practices. It focuses on unsafe actions that need correction or improvement.

Reviewed Item	Comment
H&S Training	In 2012, 1,894 hours were used for H&S training for COLP and contractor, for both the Gas Pipeline and the LNG Plant. Training is performed in external institutions such as Process Improvement Institute, Sygnus, IHF and GIE. Specialized courses include Human Error, Management of Changes (MOC), Mechanical Integrity, Process Security Management (PSM), Process Hazard Analysis (PHA), Hazard and Operability Study (HAZOP), WHAT IF Analysis, Risk Assessment, Root Cause Analysis
H&S Management Systems	The PLNG's ESHS-MS is currently under review. Additionally, the OHSAS 18001 certification is scheduled for September 2013. The correct implementation of the ESHS-MS and commitment of PLNG staff and contractors has resulted in 0 for accidents with time lost and recordable accidents. At the end of 2012, man-hours worked from the last accident with time lost achieved 5,313,775. Near misses, property damage accidents and accidents requiring first aid have occurred. Accident Investigation is a tool that finds causes and the root causes of accidents, and brings up and implements corrective measures aimed at avoiding similar accidents to happen again. This is a continuous improvement process. The goals for 2013 are more demanding with respect to 2012. The lost time injury rate (LTIR) is <0.25, recordable incident rate (RIR) is <1.25 and perfect days is 290. It is recommended to set goals for accidents that required first aid and/or medical care, property damage accidents and car accidents in order to analyze corrective measures.
Workers' Health	Medical exams are performed annually, i.e. audiometry. Ergonomic studies are also performed in order to determine potential negative impacts that could affect the worker's health.
Emergency Response and Contingency Plan	Due to new regulations, the Emergency Response Contingency Plans (previously approved by the Lenders) have been consolidated. The Plant and Gas Pipeline Contingency Plan has been submitted to OSINERGMIN for its approval on August 29 <sup>th</sup> , 2012. The IESMC has not been able to review this document as is still under agency review. PLNG routinely trains personnel and carries out drills to evaluate the response level of the plan. As a result, corrective measures and improvements are being implemented. Response actions to leakages, spillages, fires, explosions are taken into account, as well as reduction of the magnitude of the damage.

## Plant

During the Plant visit, no unsafe conditions, failure to comply with procedures, or unsafe acts that may affect the staff's health or physical integrity were identified. The IESMC was able to see the correct use of PPE (Personal Protection Equipment) by the staff. The basic PPE issued to workers consists of hard hat, flame retardant clothing, goggles, ear protection, steel-toed shoes, and leather gloves. During the mission, there was no opportunity to verify the use of special safety equipment for electrical circuit work, work at heights, jobs in confined spaces; however, these have been verified in previous opportunities by some the IESMC.

The review of documents, reports and presentations, showed had the following significant issues:

- The Plant Risk Study was elaborated, as required by regulations, by an authorized consulting firm "Inspectra". The risk study was submitted to OSINERGMIN on 07-13-2012 and is in process for approval. The study includes consequence maps to identify any risks to neighboring communities and pedestrians on the Panamerican highway.
  - Under a gas leakage scenario, the dispersion map shows natural gas concentrations below 50% LEL at the Panamerican Highway boundary.
  - Under a fire an explosion scenario, the radiation and shock wave curves are located within plant boundaries and would not affect pedestrians in the Panamerican highway, neighboring



communities of camps within the plant. The control room would be within the risk zone so a shield barrier has been implemented.

- The procedure for Management of Changes (MOC) is properly implemented. According to ESHS-MS requirements, any change may originate new risks which must be assessed and controlled through the MOC procedure. The procedure requires different instances of the organization to confirm that the process review, risk assessments, and environmental assessments have been made and all control measures are in place before the change has been implemented. A safety audit prior to the commissioning of the change is performed. An opportunity for improvement is to incorporate community relations to identify potential needs for information from or communication to the neighboring community that may arise from change.
- COLP workers and subcontractors have implemented safety committees and subcommittees or representatives of the workers (in those cases where the number of workers is not enough to compose a committee) according to national regulations. Committees hold meetings to assess safety performance and to evaluate the results of accident investigations. In order to consolidate the information provided by the contractors' committees, COLP carries out monthly meetings with the representatives of the contractors to evaluate security performance, safety and environmental issues and to reach agreements on actions to correct impairments or implement improvement opportunities.
- During 2012, Process Hazard Assessments have evaluated 7 process units will complete all units during 2013. The assessment updates the evaluations used during Plant design with current process and operational conditions. This may result on additional control measures to reduce risks, as it is established by ESHS-MS.
- Application of national laws and regulations to Plant process operations has been identified and its status of compliance has been evaluated. As new regulations are published, PLNG continuously updates the compliance matrix and the state of implementation of changes required by regulations.
- Job Safety Analysis is one of the main tools used to reduce prevent accidents in maintenance activities. Since Plant operations, all procedures related to work permits are implemented. To keep compliance of work permit procedures, audits are performed and a Work Permit committee is active since 2011.
- A Watch observation program for reporting safe/unsafe acts and conditions is implemented. This program promotes each worker to stay alert and report as good practices or situation or processes requiring correction or improvement.
- Given that a large number of plant activities, especially maintenance, are performed by COLP contractors a health and safety audit program for contractors was implemented. As of April 2013, 5 audits had already been made for Plant and the Gas Pipeline. Contractors scheduled and audited in the Plant were San Pablo and SEGUROC.
- A key element in safety performance is training. PLNG reported 1 894 man-hours of training in H&S for 2012, including COLP and its Contractors. This training hours reported include the Plant and the Pipeline. Training for pipeline activities was focused on Locked Out and Tagged Out (LOTO), emergency procedures, work permits, job safety analysis (JSA) and first aid.
- Safety drills were held for the pipeline during 2012. For year 2013, PLNG has scheduled drills for car accidents, earthquake, and sabotage.

- The ESHS-MS is being improved and it is expected to obtain the OHSAS 18001 certification in September, 2013.
- Procedure and safety programs implementation has resulted on performance indicators of 0 accidents with time lost and recordable accidents. At the end of 2012, man-hours worked from the last accident with time lost achieved 5,313,775. Near-accidents, accidents with property damage and accidents requiring first aid have occurred. Accident investigation is used to find immediate causes and the root causes of accidents, and brings up and implements corrective measures aimed at avoiding similar accidents to happen again. This is a continuous improvement process.
- For 2013 a goal has been set for accidents with time lost (LTIR) of <0.25 and recordable accidents (RIR) of <1.25 and perfect days of 290. Although indicators are becoming more demanding, it would be advisable to suggest indicators and goals for accidents with first aid, accidents with property damage and traffic accidents, so that trends and effectiveness of corrective measures can be analyzed.
- Pre-employment medical exams and annual exams are performed as required by law, including audiometric measurements and dosimeter for noise exposure. Lighting and ergonomic analysis has been conducted in working areas.
- Emergency response and contingency plans previously approved by the Lenders have been consolidated due to new legal requirements. The consolidated version of the Contingency Plan for the Plant and Gas Pipeline has been submitted to OSINERGMIN for approval on 08-29-2012. PLNG permanently trains staff on Contingency Plan and carries out drills to evaluate the response level. The evaluations of the drills result on corrective actions or improvements of performance during emergencies. Response activities include leakages, spillages, fires, explosions or other incidents, as well as emergency stop procedures that minimize the magnitude or severity of the contingency.

### Risks

Hazards and risks at LNG's Melchorita Plant have been properly identified and addressed. If a change in procedures, equipment or facilities is required, an MOC procedure should be implemented in order to control associated risks with the change and to maintain PLNG's performance compliance with international standards.

### Recommendations

The IEMC team recommends the following:

- To include potential social risks in the process of the Management of Change (MOC) and in the verification matrix in order to obtain and implement control measures for those risks.
- It is recommended to set goals for accidents that required first aid, property damage accidents and car accidents in order to analyze corrective measures.

### **Pipeline**

During the field visit, within the time limitations of a two day visit to very specific segments of a 408 km pipeline, the IESMC could observe compliance with H&S laws, regulations, guidelines, practices, and programs applicable to the operation of the pipeline and the maintenance of surface facilities, RoW, and access roads.

The hazards faced by workers are mostly related to maintenance activities and vehicle conduction on public roads and small access roads under difficult conditions, such as rain and snowfall. The risk associated to operations and maintenance activities on valves or scraper stations are similar to the ones found at the PLNG Plant. These include potential gas leakage, presence of gas, and electrical hazard. In order to prevent or minimize accidents, PLNG applies the same procedures for the pipeline as for the Plant, such as work permits and Job Safety Analysis (JSA).

During the inspection to the work front in KP 129+100 RoW, COGA personnel and Techint (sub-contractor) had and wear PPE (Personal Protection Equipment), for protection of against hazards that cannot be completely eliminated or controlled, such as falls due to the irregular terrain, eye protection against flying particles resulting from the use of hammers, picks and shovels, fall of heavy rocks or tools, and potential fire exposure. The basic PPE consists in hardhat, fire retardant clothing, safety glasses, hearing protection, steel-toed shoes, and leather or fabric gloves. See Picture N° 4 of the photographic annex. The IESMC had the opportunity to verify that the tools had been inspected in a monthly basis and had their corresponding identification.

The work crew included a licensed nurse with enough equipment and medicines to apply first aid for any incident or accident that may occur given the remote conditions where maintenance work is executed. In case of fractures, the nurse has splints for different type of fractures, neck collar, and rigid pallet to transport the injured. Medicine for diarrhea, burns, and for some common illnesses, such as respiratory diseases, is included. The nurse also has available a polyvalent snake serum. For medicine requiring medical prescription, the nurse can consult a physician over the phone. See Pictures N° 5 and 6 of the photographic annex.

All personnel, including those from local communities, have medical passes, where they record medical examinations and vaccination. The work front has a dry latrine (Chemical) and gets warm food provided in coolers by a caterer, which is inspected to verify that it meets basic sanitary conditions required by national regulations. The sanitary control encourages local suppliers (restaurants and caterers) to comply with the sanitary regulations, in order to have the opportunity to be hired as food suppliers for PLNG maintenance crews.

As shown in Pictures 7, 8, and 9 of the photographic annex, work crews had completed the work permit and JSA procedures.

Through document review, reports and presentations the team identify the following:

- Audits of work permits are carried out in order to keep a high level of compliance with work permits procedures. A Work Permits Committee is active since 2011.
- A Watch Program that promotes workers participation in safety is active, similar to the one at the Plant.
- Given that large number of tasks, especially related to maintenance, is performed by COLP contractors, an integrated audits program of H&S and Environment was implemented for contractors. During the mission, PLNG informed that 5 audits scheduled for the first quarter of 2013 for Plant and Pipeline contractors had already been performed. The contractors audited for the Pipeline were COGA and WESAC. Only three companies are scheduled to be audited during 2013 from the 10 companies that PLNG uses for maintenance or hired for special programs such as bio-restoration, PMSAP, and BMAP. Even though COGA, WESAC, and Securitas account for the majority of the workforce, personnel from other companies/institutions are also exposed to the same risks during their activities on the RoW. There is an opportunity for

improvement by introducing them into the EHS audits program in order assure their compliance with the EHS procedures applicable to the pipeline, such as PPE, first aid kits, latrines, waste management, etc. as required by the size of the crews or workgroups and activities performed.

- During the field visit, it was verified that all the personnel had a medical pass. See Pictures 10 and 11 of the photographic annex. Through the medical pass, any inspection can verify that each worker has passed the pre-occupational examination, annual examination, and has the applicable vaccination.
- For Emergency Response preparedness, PLNG performed drills during 2012 for the pipeline. For 2013, PLNG has scheduled drills for car accidents, earthquake, and sabotage to facilities. The location and scenario selected for these drills consider the typical contingencies that may occur during the pipeline maintenance activities.

## Risks

The hazards and risks associated with the operations and maintenance activities of the pipeline are duly identified and evaluated. Changes to any activity require the application of the Management of Changes (MOC) procedure. The IESMC can conclude that the risks are controlled and within the international standards with very good performance levels.

## Recommendations

The following opportunity for improvement is suggested:

- Include in the EHS audit program pipeline contractors developing activities related to special programs such as bio-restoration and monitoring (e.g. Grandes Montañas, PMSAP, BMAP, social programs).

## 3.4 ENVIRONMENTAL KEY PERFORMANCE INDICATORS

Table 5 lists four environmental key performance indicators (KPIs) applicable to the project's operation phase. The last column summarizes achievements reported by PLNG Semiannual Compliance Report for the January to June 2012 and the July - December 2012 period.

**Table 5** PLNG 2012 Environmental KPI

	TOPIC	KPI	ACHIEVEMENTS
1.	<i>Integrity of Pipeline RoW</i>	Trend	5
2.	<i>Spill on Land</i>	0	0
3.	<i>Compliance with Emission Standards</i>	>90%	100%
4.	<i>GHG Emissions</i>	Trend	1 015 513 Tons
5.	<i>Waste Recycled</i>	Trend	12.28%
6.	<i>Spills on Water</i>	0	0
7.	<i>Vegetation Cover</i>	>90%	Not Reported
8.	<i>Re-establishment of Bofedales</i>	>80%	Not Reported
9.	<i>PAH Concentration on Marine Sediments</i>	<1.684 mg/kg	<1.684 mg/kg

## **3.5 ENVIRONMENTAL PERFORMANCE**

### **Plant**

Operating activities at the Melchorita LNG Plant, Marine Terminal and ancillary facilities and the pipeline comply with the national legislation and regulations; the EMP's monitoring program for the operational phase of the Environmental Impact Assessment (EIA) for the LNG Export Project of Pampa Melchorita – Peru- (the Plan includes practices and procedures to avoid or mitigate negative environmental impacts, as well as monitoring programs); the Maximum Allowable Limits (MAL) standards applicable to the project; the Environmental Quality Standards (ECAs); the environmental chapter of the IFC's EHS General Guidelines, version April 2007; the EHS Guidelines for LNG Facilities; the IFC's Guidelines for Ports, Bays and Terminals; and the environmental procedures of the PLNG's ESHS-MS.

### **3.5.1 POLLUTION PREVENTION AND MINIMIZATION**

#### **Plant**

During the field visit, the EISMC team oversaw the domestic wastewater treatment facilities, the temporary storage area for hazardous and non-hazardous solid waste, the Marine Terminal, the dining room and the administrative offices of the Plant. All these areas complied with the waste management procedures. Waste is collected in properly classified designated colored containers. Then, it is transported to the central temporary storage area, where it is classified and separated one more time before being disposed to the authorized recycling, treatment or disposal facilities. In this field visit, waste management records were not reviewed due to time constraints.

Domestic effluents are currently treated in the former CBI's domestic wastewater treatment Plant (built and used during the construction). This was decided as the treatment plant built for the operation phase did not performed satisfactorily. PLNG has decided to carry out a general renovation of the former CBI Plant in order to use permanently for the operations phase. The plant reuses the treated domestic wastewater effluents for spraying roads in dust control and for irrigating green areas. Also, it does not use fresh water sources, such as surface water from rivers, lakes or aquifers, thus avoiding the use of natural water mainstreams. The effluent's quality parameters comply with the irrigation water standards. Lab results are analyzed and summarized in Section 3.7 Operating Phase Monitoring.

In areas where there is no sewage collection system, there are portable toilets. A truck collects the sewage from these areas and transports it to a third party treating facility.

Handling of hazardous chemical substances has been duly established in the design phase, taking into consideration international design standards for LNG plants and terminals; and the NFPA standards. Moreover, it successfully meets the IFC PS guidelines and the specific LNG facilities guidelines. Chemical products are located on a secondary containment to protect the soil from undesired spills or any other potential contamination. Some of these hazardous chemical products are propane, ethylene, Therminol, activated Methyl Diethanolamine (MDEA) and sodium hypochlorite. Also solids hazardous compounds, such as molecular sieves or activated carbon and others, packed in smaller containers, are used. These products shall be handled as per the manufacturer's instructions set out in the material safety data sheet (MSDS).

Water drainage that may be polluted with grease, oils or hydrocarbons are collected and treated in a CPI (corrugated plate interceptor) oil/water separator. This unit removes hydrocarbons from the water before it is discharged into the Water outfall. The collected hydrocarbons are stored in a tank for its subsequent treatment and disposal as hazardous waste. Results analysis and compliance assessment can be found in section 4.7 Operating Phase Monitoring.

Another effluent discharged into the sea is brine from the Reverse Osmosis process. The plant receives seawater collected in the pier of the Marine Terminal, where water passes through a semipermeable membrane to be purified. Cleaned water with low salt content is extracted and used as potable water. The resulting brine (Reverse Osmosis effluent) is monitored and mixed with CPI separator effluent before it is discharged into the sea. The combined discharge into the sea is also monitored. Results analysis and compliance assessment of the brine and combined effluent can be found in section 4.7 Operating Phase Monitoring.

Potential negative environmental impacts due to combustion emissions have been evaluated in order to reduce its generation. Since natural gas and appropriate equipment are used, exhaust gases emissions do not exceed the MAL applicable to this Project. Another significant aspect is the Plant's location, far from any other industrial buildings in an area with moderate winds and absence of significant ground elevations (hills), which allows high dispersion and low concentration of pollutants in the air quality. Results analysis and compliance assessment can be found in section 4.7 Operating Phase Monitoring.

With regard to GHGs emissions, the plant uses natural gas with low carbon content, and highly efficient equipments were selected during the design phase, which reduces the amount of GHGs emissions per cubic meter of LNG produced. This complies with IFC PS 3: Resource Efficiency and Pollution Prevention; and the IFC's Guidelines for LNG Plants. Likewise, the Plant's GHGs emissions are within the scope of emissions 1 (Emissions generated by PLNG) and 2 (Emissions related to the purchase and consumption of electricity).

In regards of noise, even though the Plant has equipment that generates noises with high levels of decibels, the design has taken into account a safety buffer area which fulfills the purpose of maintaining the population outside the area in which they could be affected; at the same time, since noise is reduced with distance, the noise levels in the surrounding areas of the Plant achieve residential levels.

## **Pipeline**

The waste management practices during maintenance activities in the RoW were evaluated based on the field inspections made during the mission to working crews and documentation provided by PLNG.

Waste generated during operation and maintenance activities is temporarily stored at the pipeline contractor bases in Ayacucho and Ica. Industrial and hazardous waste are collected by authorized companies for disposal in approved facilities. Domestic waste is delivered to the city's waste collection service. In some cases, such as in the Chiquintirca and San Clemente camps, organic waste is treated in compost cells and the compost is used to improve the green areas of the camp or the RoW. For those crews from contractors other than COGA or Techint, domestic waste is buried in cells. It suggested that cell closure be document when leaving the work area in order to avoid

potential liabilities in the future. During the visit to the work crew at KP 129+100, good waste management practices were verified as the waste was separated and gathered in bags for subsequent transportation to the collection area in the Ayacucho Base.

The mission did not include working crews requiring fuel and lubricants handling. The IESMC has carried out visits to such locations before and as a result of the evaluation some suggestions were made to improve handling practices. The compliance report for the first semester of 2012 indicates the implementation of corrective measures for the handling of hazardous substances and waste as a response to the suggestions made in the IESM team mission dated December 2011.

#### Risks

The IESMC team concludes that there are no environmental risks associated to the operational activities of the Melchorita LNG Plant, the Marine Terminal since they are properly monitored and controlled as per international design standards and environmental practices in compliance with the IFC's Guidelines.

The pipeline has no environmental risks foreseen for pollution due to hazardous substances or waste and domestic or industrial waste as the management of these issues is within the parameters established in the ESHS-MS.

#### Recommendations

No recommendations or suggestions regarding opportunities for improvement are made.

### **3.5.2 PIPELINE MAINTENANCE**

The objective of the Pipeline Maintenance program is to maintain the pipeline RoW and associated facilities geo-technically stable and to prevent erosion processes. The April 2013 mission included an over flight of the RoW which provided a general picture of erosion control and vegetation cover restoration. The mission also included inspection to specific sections of the RoW, which provided more detail regarding the execution erosion control works, the degree of recovery of the vegetation in the RoW.

The helicopter over flight from approximately KP 10 to KP 132 showed no major RoW stability issues, such as depressions, gullies or landslides, provided the limitations inherent to flight height and speed. PLNG RoW monitoring activities carried out during the rainy season and inspections performed immediately after show effects of rain runoff, such as buffer strip saturation, damage in drainage channels and outfalls, different levels of erosion and, in some places, evidence of creeping soil. Some examples of runoff effects on the RoW can be observed in photographs 12, 13 and 14 of the photographic appendix. The PMSAP monitoring report for the January – March 2013 period showed that 61 % of the findings corresponded RoW geotechnical issues. The results of the ESHS-MS monitoring and the pipeline integrity system, supplemented by the information of PMSAP findings are used to plan work program for the erosion and geotechnical maintenance of the RoW.

During 2012, a hillside adjacent to Kp 28 was subject to geotechnical stability works due to a creeping that could affect pipeline integrity. Work execution, based on to the sequence of photographs provided by PLNG, included the implementation of applicable environmental mitigation procedures, such as top soil removal and stockpiling in a safe place for its use during recon touring; construction of geotechnical works to stabilize the hillside with gabions at the toe of the slope;

construction of sub-surface and surface water drainage, land recontouring and seeding of fast-growing pasture (with seed mixtures approved in the EMP) achieving a vegetation coverage of the intervened areas.

A key issue during the mission was the review of the access road to Ccollpas (also often written as Jolpas). Due to weather conditions, the over flight could not reach the access road so the evaluation was based on a presentation and photographs taken during the works. Given that the access road is responsibility of the Municipality of Chiquintirca, the stabilization work was performed by the Municipality under PLNG's supervision and advice. The works consisted on the removal of unstable material from hillsides and road slopes and embankments and its transportation to surplus material dumpsites; the construction of drainage works for storm water and recontouring of existing excess material dumpsites. The executed works has left the road in stable conditions.

### Risks

Geotechnical and erosion risks are properly controlled and monitored within the international standards.

### Recommendations

Annual planning based on RoW inspection and cross reference to PMSAP should continue to ensure proper RoW maintenance.

## **3.5.3 REVEGETATION AND BIORESTORATION**

The objective of the Revegetation and Bio-restoration Plan is to adequately manage the ecosystem restoration of the areas that originally had native vegetation and that were directly impacted by the pipeline construction and associated activities, including access roads, shooflies, camps, pipe yards, borrow pits and disposal sites.

The evaluation of the bio-restoration of the pipeline and ancillary facilities is performed by Grandes Montañas who walks the RoW with vegetation coverage (kp 0 – 275). Grandes Montañas identifies which areas are fully restored and do not require further activity and which require seeding or transplanting of native grasses or soil amelioration. This is complemented with information collected by the Grievance Management Program and the PMSAP in order to prepare a list of RoW segments to be included in the bio-restoration campaign.

The IESMC over-flight, visits to the RoW, and the preliminary BMAP results showed that vegetation coverage and bio-restoration in most areas has been successful, especially in croplands and low altitude mountains. The preliminary results of the restoration program show that some sectors of the RoW already have achieved a vegetation cover similar to those adjacent areas unaffected by construction activities. The BMAP results show that the biodiversity where full vegetation coverage has been achieved is still not comparable to similar areas not affected by construction. Nevertheless, the natural species colonization is already in process which will result, in the long term, on RoW conditions similar to its original conditions, recovering habitat for the fauna of the intervened areas.

Areas located at high altitude with low natural fertility and water availability are recovering slowly and will require several years and bioremediation campaigns to achieve a complete recovery. This



challenge is faced on RoW above 4,000 meters above sea level with shallow soils, where excavations resulted in increased rockiness over the RoW. These conditions are mostly located in the western Andean sector of the pipeline. See photographs 15 and 16 of the photographic appendix.

Based on the Pipeline Quarterly Report, September - November 2012, PLNG identified 65 km of the RoW that needed further bio-restoration. The bio-restoration campaign started in November 27, 2012, ended in February 2013. Its focus was on affected lands located at particularly challenging conditions such as high altitude (4,000 meters above sea level), poor pre-existent soil and extreme environmental conditions (high wind, and hail or snow), high concentrations of rocks, low temperatures and low rain levels, aggravated by the disturbance caused by pipeline construction, all of which has resulted in a slow speed re-vegetation and bio-restoration processes.

The November 2012–February 2013 Bio-restoration Campaign included the RoW across 16 communities of the high Andean zone (4 more than in 2011). Several strategies, including soil improvement in 24.5 km (12 communities) by using local manure (guano) from surrounding communities, are being tested to accelerate Bio-restoration.

A key indicator for pipeline environmental performance is vegetation coverage recovery of sites affected by construction. The KPI is defined as the percentage of adequately bio restored area between the total areas requiring biorestorement. The goal for 2012 was 90%. Even though PLNG informed that vegetation cover evaluation had been carried out through satellite images and other means, no evidence on how the annual KPI was calculated and the compliance report for the second half of 2012 does not include the results of this KPI.

The KPI tracking restoration of Andean wetlands is also missing in the compliance report for the 2<sup>nd</sup> semester of 2012 as this evaluation was not performed by PLNG. This indicator has an objective of 80% recovery for 2012. The BMAP has begun the implementation of a protocol to assess the Andean wetland recovery; however, no results have yet been obtained.

Although the pipeline RoW still show few sectors with low vegetation coverage recovery, the biorestorement works efforts as evidenced by PLNG reports and past efforts show the Project commitment to fully recover the RoW. The biorestorement works are scheduled every year and incorporate lessons learned and new techniques to improve success. Based on this, the biorestorement is performed at the start of the rainy season, when the most suitable conditions for plant development will occur and incorporates fertilization, seed sowing and translocation of pasture or shrub species. The program has incorporated local techniques (e.g. use of camelids manure) and is constantly evaluating different techniques that will provide new experiences and help improve the biorestorement effort for this and other Andean projects.

### Risks

Areas located at high altitude with low natural fertility and water availability, where construction has resulted in loss of soils and increase in rockiness, represent a challenge for recovering the vegetation coverage to conditions similar to pre-construction. In some cases it will require several years and biorestorement campaigns to achieve a complete recovery.

Social risks related to biorestorement were discussed on section 2.3.10.

### Recommendations

PLNG must assess and calculate the KPI E-07 and E-08 and report them the next compliance report.

Bio-restoration effort on high altitude areas should continue to be monitored, including evaluating success of the different techniques used.

Based on the evaluation of the November 2012- February 2013 bio-restoration campaign, additional campaigns should be scheduled.

Recommendations regarding social issues are found in section 2.3.10.

### **3.5.4 MARINE TERMINAL IMPACTS**

One of the key concerns over the marine terminal operation was the effect the jetty and the roll off pier would have on the marine ecosystem and the coastal configuration. The marine ecosystem concerns were potential introduction of exotic species and loss of biomass and fisheries. The marine ecosystem is monitored through a variety of programs such as the sediment and seawater monitoring program (see section 3.7), the Marine Participatory Monitoring Program, and the BMAP. Exotic species introduction is monitored through ballast and seawater sampling. All ships entering the marine terminal are subject to ballast water monitoring for oil and grease, E. Coli, V.Cholerae, and zoo and fitoplankton. The results for zoo and fitoplankton have not shown invasive species. This is also corroborated with the results reported in the BMAP (see section 3.5.5).

The jetty has had effect on the marine bird population, fish community and benthos. The jetty and trestle have experienced a very large increase in marine birds. This has resulted in maintenance issues for the marine facilities. PLNG has implemented biological control through the use of falcons to keep the birds away from the facilities and has placed nets on the jetty and structures to reduce nesting areas for the birds.

Results of the BAP show fish and benthos increases in biomass and abundance on areas located close to the jetty and trestle. This is a typical impact as new infrastructure creates new habitats for species, which are further protected by fishing exclusion required by the marine terminal operation.

The construction of the jetty and the roll off pier resulted in a modification of the predominant currents. As consequence, coastal sediment dynamics have been change resulting in new areas of sedimentation and erosion until the coastal profile reaches its new balance. Modifications have mainly occurred in front of the LNG Plant within the exclusion zone. A coastal segment located 2 km north of the plant is experiencing erosion and another located 3 km north is subject to sedimentation.

PLNG has a coastal monitoring program that does topographic and morphology survey in the 3 control areas located in the marine exclusion zone, the erosion area and the sedimentation area. The trends of each area are mapped and compared to identify changes in the speed of these processes. Results show that from April 2010 to November 2012, sedimentation rates have decreased by 8%.

### Risks

Coastal areas north of the plant have not reached sediment transport equilibrium therefore the beach is still changing its configuration (shape and type of materials). Environmental risks are properly controlled and monitored within the international standards.

### Recommendations

No recommendations or suggestions regarding opportunities for improvement are made.

## **3.5.5 BIODIVERSITY MONITORING AND ASSESSMENT PROGRAM (BMAP)**

The main purpose of the Biodiversity Monitoring and Assessment Program (BMAP) is to monitor, under scientific rigor, indicator species and important ecological habitats, recovery of habitats affected by construction and marine terminal impacts. The BMAP goals are to develop recommendations for mitigation and disseminate knowledge through publications, conferences, and training. The program encompasses both coastal and highland areas.

The BMAP is a joint effort of PLNG and the Smithsonian Institute. It has four main programs associated with the PLNG project: bio-restoration, fresh water ecosystems, marine ecosystems, and a conservation program that is in a pilot phase. The BMAP is fully operational and has 11 outings planned for 2013.

The BMAP 2012 campaign has shown results for biodiversity and communities in the pipeline RoW and how rodents and lizards dispersion has change in impact and control plots given their role as seed spreaders. Another key issue target by the BMAP is the Marine Terminal effects. Results show that the abundance and biomass have increased in areas located closer to the Jetty and no exotic species has been identified.

In addition, the BMAP is monitoring boat and coastal artisanal fishing activities to evaluate trends on species, capture effort, and fisheries sustainability. Data shows that current fishing practices are showing stress on the resources as more than 50% of the specimens captured are immature. This is an overall trend in marine fisheries in Peru as growing coastal population has increased the demand for fish.

### Recommendations

PLNG could incorporate as part of the SEP programs to introduce sustainable practices to the fishermen associations.

## **3.6 ESHS-MS OPERATING PHASE**

Schedule 5.17(g) – Part A, CTA, item 17 requires from PLNG the development and implementation of an ESHS-MS for the operating phase, which is consistent with ISO 14001 for environmental issues and OHSAS 18001 for Occupational Safety and Health.

The ESHS-MS for the operating phase was developed and implemented in July 2010 during the commissioning process. In compliance with CTA requirements, the management system is compatible with ISO 14001 in regards to environmental issues management and compatible with OHSAS 18001 in regards to Occupational Health and Safety. The management system is applicable to all project operations in the Gas Pipeline, the LNG Plant and the Marine Terminal.

PLNG uses the four-step quality management system (PDCA), which is based on a continuous improvement cycle and has the following components:

- Plan (policies and leadership, risk assessment and risk management, legal and contractual requirements, objectives, goals and plans);
- Do (roles and responsibilities, training, communication systems, records and documents control, operational control);
- Check (inspections, audits, monitoring programs to identify non-conformances and opportunities for improvement); and
- Act (implement corrective or improvement actions).

The ESHS-MS provides general management system procedures, such as the following

- Risk Control Plan;
- Incident Investigation Plan;
- Audit Plan;
- Numeric Standards applicable to the Project; and
- The Contingency Plan.

The description of the management system components and the appropriate ESHS-MS review by management are also included.

The ESHS-MS presents specific procedures to manage Occupational Safety and Health issues, such as the following:

- Occupational Health Program;
- Physical Risk Control Program;
- Chemical Risk Control Program;
- Fire Risk Control Program;
- Job Safety Analysis; and
- Work Permits.

These procedures have been already implemented and its correct performance is verified through inspection programs; internal and external audits; and the monitoring of the exposure of workers to physical, chemical and ergonomic risks through annual medical examinations.

The ESHS-MS also has programs and specific procedures to control potential negative environmental aspects, such as the following:

- Waste Management Program;
- Air Management Program (for emissions, noise and vibrations);
- Water Management Program (for water extraction, river crossing, wetland conservation, effluent disposal by irrigation, and environment);
- Soil Management Program (for the prevention of soil contamination, erosion control and restoration);
- Marine Management Program (maintenance of vessels and associated facilities, marine traffic, ballast water management, fuel load, hazardous materials, waste management, spill prevention, marine dynamics and coastal profile, flora and fauna).

The implementation and its adequate application are checked through inspections and audits. Corrective or improvement measures are monitored through the Action Tracking System (ATS).

Even though the PLNG's ESHS-MS complies with CTA requirements, PLNG has decided to obtain the certification of the standards ISO 9001:2008, ISO 14001:2004 and OSHAS 18001:2007, for which it has been gradually adapting its management system to the requirements of the standards above mentioned. By the end of 2012, progress of improvements needed were 75.12% for ISO 9001, 87.15% for ISO 14001 and 85.34% for ISO 18001.

Pipeline RoW and facilities contractor COGA has its own ESHS-MS, which has a three-standard certification: ISO 9001 (Quality), ISO 14001 (Environment) and OHSAS 18001 (Occupational Health and Safety). COGA's MS, as well as Techint's MS (sub-contractor) are compatible with PLNG-COLP's MS.

Other pipeline contractors such as WESAC do not have their own management system; therefore, COLP has provided them technical support to apply the PLNG's ESHS-MS procedures. In 2012, an internal audit was performed for PLNG/COLP to COGA's ESHS-MS procedures in waste management and pollution control and four minor non-compliances were observed. During the first semester of 2013, another internal ESHS audit was performed to COGA and one to WESAC.

During the first quarter of 2013, the Plant has been subjected to two external audits, one from the National Port Authority (ANP) and the other one from the Agency for Environmental Assessment and Control (OEFA), and no observations were made. Likewise, two integrated HSE audits to the contractors San Pablo and SEGUROC were carried out. Ten areas have been inspected so far this year 2013.

### Risks

Based on the documents reviewed, as well as on the field visit, it is concluded that PLNG's ESHS-MS is appropriate and it exceeds standard criteria by constantly self-improving its management system. As a result, the risks inherent to the operation of a LNG Plant and its port facilities in regards of ESHS-MS are controlled and within the proper international standards.

### Recommendations

As stated in Section 2.4, the ESHS could benefit from a larger input from the PLNG social team in order to further align the objectives. More details on this can be found in Section 2.4.

### 3.7 OPERATIONAL PHASE MONITORING

Monitoring of operating activities at the Melchorita LNG Plant, Marine Terminal, and ancillary facilities is part of the EMP's monitoring program for the operational phase of the Environmental Impact Assessment (EIA) approved for the LNG Export Project of Pampa Melchorita - Peru. The monitoring plan has been regularly updated; additional monitoring points, as well as additional parameters have been included as per recommendations made in external audits and effluent discharge permits.

The EMP keeps the monitoring program updated within ESHS-MS. Table 6 shows the parameters and monitoring frequency for the LNG Plant. The maximum allowable criteria and applicable environmental quality standards are set out in a document called Numeric Standards, which is a document of the ESHS-MS.

#### Risks

Based on the review of the results of the monitoring program used, no material risks are foreseen for the Project.

#### Recommendations

Taking into consideration the observations made in the evaluation of the monitoring program application for the Plant, the following is recommended to:

- Include the results of the vehicle emissions monitoring in the compliance reports delivered to the Lenders;
- Complete the annual stack gas monitoring of the sampling station GTG N° 3 as soon as this equipment is in operation, in order to check that emissions are within the allowable criteria;
- Control that the laboratory presents the result considering the limit of detection (i.e. there should be no values below the limit of detection or express values exceeding the limit of detection as "less than");
- Improve quality control in the preparation of the results table included in the compliance reports for the Lenders, in order to avoid data misrepresentation;
- Include in the compliance reports for the Lenders waste management trend graphs within the waste monitoring requirements of the EMP's monitoring program; and
- Document through technical evaluations (statistics and/or trends) the conclusion that indicates that the results exceeding the sea quality standard are not due to the Project's activities.

**Table 6** Parameters and Monitoring Frequency for LNG Plant.

Parameter	Monitoring Frequency	Locations	Status
<b>Air Quality</b>	Quarterly* *Could be adjusted based on results	<ul style="list-style-type: none"> <li>4 stations in the plant or surroundings</li> <li>1 station outside the plant in direction of the nearest potential receptor</li> </ul>	PLNG has performed the 2012 monitoring. All results obtained are within the applicable standards.
<b>Emissions Quality</b>	<ul style="list-style-type: none"> <li>Annually (for first 3 years)</li> <li>Every 3 years (thereafter)</li> </ul>	<ul style="list-style-type: none"> <li>8 stacks</li> </ul>	<p>During 2012, monitoring was carried out according to the frequency and in the locations established. All the results obtained were within applicable standards. Samples from sampling station GTG N° 3 were not collected since it was out of service for maintenance.</p> <p>The EMP also registers vehicles emissions the first time they are used in the Project, and then the annual emissions certificate is checked.</p> <p>Vehicle emission monitoring is reported in the semi-annual compliance reports. Monitoring is carried out and reported to the national authorities in monthly reports.</p>
<b>Environmental Noise</b>	Quarterly	<ul style="list-style-type: none"> <li>7 stations inside the plant</li> <li>3 stations outside the plant</li> </ul> <p>Measurements during the day and night.</p>	<p>During 2012 and in the first quarter of 2013 measurements were carried out in the locations and with the frequency set out.</p> <p>The results obtained within the plant are in compliance with the applicable standards; however, the results obtained outside the plant show noise levels above the residential standards due to noise sources external to the plant.</p>
<b>Domestic Effluents</b>	Monthly. More sampling and analysis can be performed in the event of operating problems.	<ul style="list-style-type: none"> <li>At the treatment system outlet</li> </ul>	<p>Results are assessed against the irrigation water standards.</p> <p>During 2012, monitoring was carried out on a monthly basis and only in September the results showed Total Coliforms (TC) above the criteria.</p>
<b>Industrial Effluent – CPI</b>	Monthly, prior to mixing with brine from the desalination plant. More sampling and analysis can be performed in the event of operating problems.	<ul style="list-style-type: none"> <li>At the oil/water separator</li> </ul>	<p>The applicable standard for discharges into the sea is set out in the numeric standards document. During 2012, monitoring was carried out on a monthly basis during discharge. In July, August and September no discharges were carried out due to the discharge permit expiration.</p> <p>The results were within the standard, except for the results of residual chlorine in January. Review of results showed parameters reported as below detection limit with values over the reported detection limit. PLNG will request an explanation of results clarification to the laboratory, which shall be avoided in the laboratory.</p>
<b>Industrial Effluent – Brine Reverse Osmosis Plant</b>	Monthly	<ul style="list-style-type: none"> <li>At the Reverse Osmosis Plant</li> </ul>	<p>In 2012 monitoring was carried out on a monthly basis. According to the semiannual Compliance report, the results of the first semester were within the applicable standard, except for two results regarding residual chlorine (in January and April) and one results regarding COD. The report also showed that the content of lead for the first semester largely exceeded the standard; however, this only appears to be a typing mistake since the results showed in the monthly reports submitted to the national authorities indicated compliance. In the second semester all reported results were within the applicable standards.</p>
<b>Combined Industrial Effluent</b>	Monthly	Point discharge into the sea: At the in-line blending of the effluents from the CPI and the Reverse Osmosis Plant	<p>The parameters monitored are the same as for the CPI and Brine effluents with the addition of the sea water quality monitoring so the results of the effluents can be compared to those of the receiving body.</p> <p>First semester 2012, all results were within the acceptable criteria, except for March which reported high values of fecal and TC and lead for the whole semester. Resampling was conducted fecal and total coliforms and both parameters resulted within standard. Monthly reports submitted to the national authorities showed that both coliforms and lead are within permitted values, which could mean that the samples are different or that there is any other issue affecting the results of the compliance reports submitted to the authorities or to the Lenders.</p> <p>In the semester of 2012 all results reported were within the standard values applicable to the Project.</p>
<b>Solid Waste Monitoring</b>	Semi-annual compliance reports Monthly reports	N/A	<p>The EMP's monitoring program sets out a requirement for formal monitoring of waste generation. Disposal and recycling rates shall be assumed.</p> <p>Semi-annual compliance reports submitted to the Lenders include the KPI that measures the monthly percentage of reused and recycled waste compared to the total waste produced. The monthly reports delivered to the authorities show more details regarding the different types of waste produced and include transportation and disposal certificates, which show the performance and compliance with the waste management procedures approved in the ESHS-MS.</p> <p>According to the information received during the presentations at the mission, the percentages of the different types of waste during 2012 are very similar to those of the first half of 2013. The graphs concerning the percentage of recycled waste during 2012 and so far this year 2013 is good evidence that PLNG conducts daily monitoring of the waste management.</p>
<b>Dredging Activities Monitoring</b>	<ul style="list-style-type: none"> <li>Turbidity / TSS: Daily</li> <li>Arsenic: Weekly</li> </ul>	N/A	<p>Total Suspended Solids (TSS) measurements are derived from turbidity measurements through correlation charts. The Dredging Environmental Management Plan presents detailed information regarding the frequencies, parameters, monitoring stations and standards that shall be complied with.</p> <p>PLNG carried out a dredging campaign between 12<sup>th</sup> and 24<sup>th</sup> March 2012. It was reported that daily monitoring was performed and all the results were within the applicable criteria.</p>
<b>Sol Monitoring</b>	Event-based: In the event of a spill with potential soil contamination	N/A	<p>Two minor lubricant spillage took place in 2012 (one-gallon, and a quarter of a liter, respectively) without adverse effects to the soil. As a result, there was no need to carry out soil monitoring in 2012.</p>
<b>Sea Water Monitoring</b>	Quarterly	<ul style="list-style-type: none"> <li>9 stations at the surface</li> <li>11 stations at three depth levels: <ul style="list-style-type: none"> <li>Surface</li> <li>Mean Depth</li> <li>Bottom</li> </ul> </li> </ul>	<p>The stations cover the requirements of the EIA and discharge permits, as well as the IESMC recommendations. PLNG conducted monitoring during 2012 and the first half of 2013 in all the stations with the established frequency.</p> <p>Most results were within the quality standards applicable to the Project. Copper (Cu), nitrates, nitrogen as NH<sub>3</sub>, mercury (Hg), selenium (Se), hydrogen sulfide (H<sub>2</sub>S) and lead (Pb) eventually exceed the criteria. These compounds, as reported by PLNG, are not always present in the stations themselves, but in areas far from the Project, such as the Sea Terminal, and similar results were found while taking the EIA baseline. However, since the non-conformance results cannot be attributed to the Project, it is necessary to document the conclusions by means of a technical assessment in time since non-conformance results in the sea terminal's area of influence have been recorded in more than one monitoring cycle.</p>

## 4.0 ADMINISTRATIVE PROCEDURES

PLNG has received notifications from OEFA that will start a non-compliance administrative procedure that may result on fines. All procedures opened by OEFA are related to non-compliances identify by OSINERGMIN during the 2007-2008-2009 period, when that agency was responsible for environmental compliance. PLNG is timely addressing each of them in order to get them resolved. Based on the review made, the observations were resolved by PLNG within the time frame requested by OSINERGMIN for resolution and therefore PLNG was not subject to a fine for any of them. When OEFA took over as compliance agency, it incorporated a policy that each observation should be subject to a fine as they represent non-compliance with the EIA or national regulations.

In compliance with the CTA, PLNG has informed the Inter Creditor Agency (ICA) and the Lenders of these procedures and will inform as soon as they are resolved.

## 5.0 RISKS AND IMPACT MANAGEMENT

Table 7 provides a summary of the social and environmental risks identified for this period. Based on the information reviewed and the visit, the IESMC has concluded that:

- 1) No major social risks were identified;
- 2) The risks identified are classified as low and moderate;
- 3) PLNG is fully aware of the social and environmental risks and has adequately identify them;
- 4) Risk triggers are being dealt with and expected to be solved in a short/mid-term; and
- 5) PLNG's ESHS-MS provides procedures and plans to properly address potential risks.

**Table 7** Identified Risks

Program	Risk Cause(s)	Risk
Fishermen Compensation Management Plan (FCMP) Section 2.3.4	Lengthy negotiation process with Herbay fishermen association. Moreover, there are still 21 individual fishermen pending to sign the compensation agreement.	Low Risk: - Dealing with expectations for compensation claims - Social conflict
Pipeline Compensation Management Plan (PCMP) Section 2.3.5	Vinchos community compensation claims.	Low Risk: - Damage claims and grievances - Dealing with expectations for compensation claims - Stoppages
Livelihood Restoration Program (LRP) Section 2.3.6	Slow performance of re-vegetation and bio-restoration processes on the RoWin high altitude lands (above 3,800 meters), which is used for grazing of camelids. Full recovery of pastures will be achieved in longer than 3-years.	Moderate Risk: Compensation claims and grievance due to slow restoration processes



Program	Risk Cause(s)	Risk
Influx Management Plan (IMP) (around LNG Plant buffer zone) Section 2.3.7	Rapid expansion of the “Asentamiento Humano Nuevo Cañete”, (APCPNC), “El Trébol del Pacífico”, “Brisas del Concón” and other settlements located South and North of the LNG Plant.  Population growth is causing encroachment in areas nearby the LNG Plant’s buffer zone.	Low Risk: - Physical damages around the LNG Plant’s buffer zone.
High Consequence Areas (HCA) Section 2.3.7	Population growth is causing encroachment along the pipeline, especially between KP 376+800 and KP 380+600. This might pose a potential risk to the pipeline as well as to the newly created neighborhoods.	Low Risk: - Physical damages to the pipeline - Conflicts with neighboring inhabitants and local government.
Bio-restoration Program Section 2.3.10	Areas located at high altitude with low natural fertility and water availability where construction has resulted in loss of soils and increase in rockiness represent a challenge for recovering the vegetation coverage to conditions similar to pre-construction.	Low Risk: - Risks associated with the LRP as they do not represent a risk to the integrity of the pipeline.
Coastal sediment transport Section 3.5.4	Beaches located up to 3 km north of the plant have not yet reached sediment transport equilibrium. This causes erosion and sedimentation of beaches used by local artisanal fishermen.	Low Risk: - Modification of the coastal profile.

In the 2014 monitoring field visit, the IESMC will follow up on the management and evolution of identified risks.

Annex I: Documentation Review

Annex II: HCA Satellite Imagery

Annex III: Photographic documentation

## Annex I

### Documentation Review

## **LIST OF DELIVERED ENVIRONMENTAL DOCUMENTATION DURING LENDERS MISSION TO THE LNG PLANT AND PIPELINE**

**04 to 10 April, 2013**

- TAB 01 – Health & Safety Presentation
- TAB 02 – Social Responsibility
- TAB 03 – Pipeline Operations, Maintenance and Integrity Management
- TAB 04 – Plant Environmental
- TAB 05 – Pipeline Environmental
- TAB 06 – Biodiversity Monitoring and Assessment Program (BMAP)
- TAB 07 – Shutdown Activity
- TAB 08 – Plant and Operations
- TAB 09 – Plan de compensación Fishermen
- TAB 10 – Condoray Asistencia técnica
- TAB 11 – Asistencia tecnica – Etapa I a IV
- TAB 12 – Informe Asistencia Tecnica Etapa IV
- TAB 13 – Informe Asistencia Tecnica Etapa II
- TAB 14 – Informe Asistencia Tecnica Etapa III
- TAB 15 – HCA 379 –Esp-Img-2005-2006
- TAB 16 – HCA 379 –Esp-Img-2007-2008
- TAB 17 – HCA 379 –Esp-Img-2010
- TAB 18 – HCA 379 –Esp-Img-2011
- TAB 19 – HCA 379 –Esp-Img-2012
- TAB 20 – Pipeline Environmental lenders 2

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- 1.1.1.2. *Capítulo II Descripción del Proyecto*
- 1.1.1.3. *Capítulo III Estudios de Línea Base*
- 1.1.1.4. *Capítulo IV Evaluación Ambiental*
- 1.1.1.5. *Capítulo V Plan de Manejo Ambiental y Monitoreo*
- 1.1.1.6. *Capítulo VI Consulta Publica*
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- 1.1.2.2. *Anexo 2 Resultados de la Recolección de Datos de Campo y los Análisis de Laboratorios*
- 1.1.2.3. *Anexo 3 Evaluación de Impactos, Modelamiento de Aire y Ruido*
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- 1.1.2.5. *Anexo 5 Documentación de Consultas Publicas*
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### 1.2. Observaciones (1,2 Round)

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- 1.2.2. *Segunda Ronda*

## 2. EIA SD – PLANTA

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- 2.1.1.1. *Resumen Ejecutivo*
- 2.1.1.2. *Sección I Características del Proyecto y Marco Legal e Institucional*
- 2.1.1.3. *Sección II Modificaciones al Proyecto del Diseño del Proyecto de Exportación del GNL*
- 2.1.1.4. *Sección III Cambios en la Línea Base*
- 2.1.1.5. *Sección IV Evaluación Ambiental Complementaria*
- 2.1.1.6. *Sección V Modificación al Plan de Manejo Socio-Ambiental*

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- 2.1.2.1. *Anexo A Análisis de Consecuencias de Radiación Termal*
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- 2.1.2.3. *Anexo C Actualización del Estudio de Línea Base Ambiental*

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- 3.1.1.2. *Volumen II Línea Bases*
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- 4.12. Reporte Ambiental Diciembre 2012

## **5. REPORTES TRIMESTRALES DUCTO 2012**

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- 5.2. Reporte Trimestral Mar- Apr- May
- 5.3. Reporte Trimestral Jun- Jul- Aug
- 5.4. Reporte Trimestral Sep –Oct- Nov

## **6. INFORME CONSULTOR INDEPENDIENTE**

- 6.1. Peru LNG Project Completion - Plant and Pipeline / Upstream Facilities (JGP Consultoría)

## **7. INFORMES SEMESTRALES DE CUMPLIMIENTO**

- 7.1. Environmental, Social, Health and Safety Semi-Annual Report (1st half of 2012)
- 7.2. Environmental, Social, Health and Safety Semi-Annual Report (2nd half of 2012)

## **8. CARTAS ENVIADAS AL ICA 2012**

### **8.1. 2012**

- 8.1.1. PLNG-SG-018-12
- 8.1.2. PLNG-SG-019-12
- 8.1.3. PLNG-SG-024-12
- 8.1.4. PLNG-SG-036-12
- 8.1.5. PLNG-SG-044-12
- 8.1.6. PLNG-SG-045-12
- 8.1.7. PLNG-SG-056-12
- 8.1.8. PLNG-SG-062-12
- 8.1.9. PLNG-SG-064-12

### **8.2. 2013**

- 8.2.1. PLNG-SG-004-13
- 8.2.2. PLNG-SG-005-13
- 8.2.3. PLNG-SG-008-13

## Annex II

### HCA SATELLITE IMAGERY



## Satellite Image 2011



Gasoducto PERU LNG

Gasoducto TGP



11



Area de Alta Consecuencia  
(HCA) 200m

Fuente:

- Instituto Geográfico Nacional.
- Instituto Nacional Estadística e Informática.
- Ministerio de Transportes y Comunicaciones.
- Techint.
- Imágenes Ikonos (período de toma 2011)

Referencia Espacial.

- Datum WGS
- UTM 18 Sur



**TÍTULO:** High Consequence Area (HCA) at Kp 379  
Area de Alta Consecuencia en Kp 379

Responsable:  
Luis Saez

Área Responsable: Pipeline

Elaborado para: **Informacion**

Fecha: J

Escala:  
1 : 8000

Elaborado por:  
COLP IT - GIS

Papel: **A3**



# Area de Alta Consecuencia en Kp 379 - Areas de Crecimiento Urbano

Satellite Image 2010



## LEYENDA

Gasoducto PERU LNG

Gasoducto TGP

Valvula PERU LNG



Derecho de Via (20 m)

Area de Alta Consecuencia (HCA) 200m

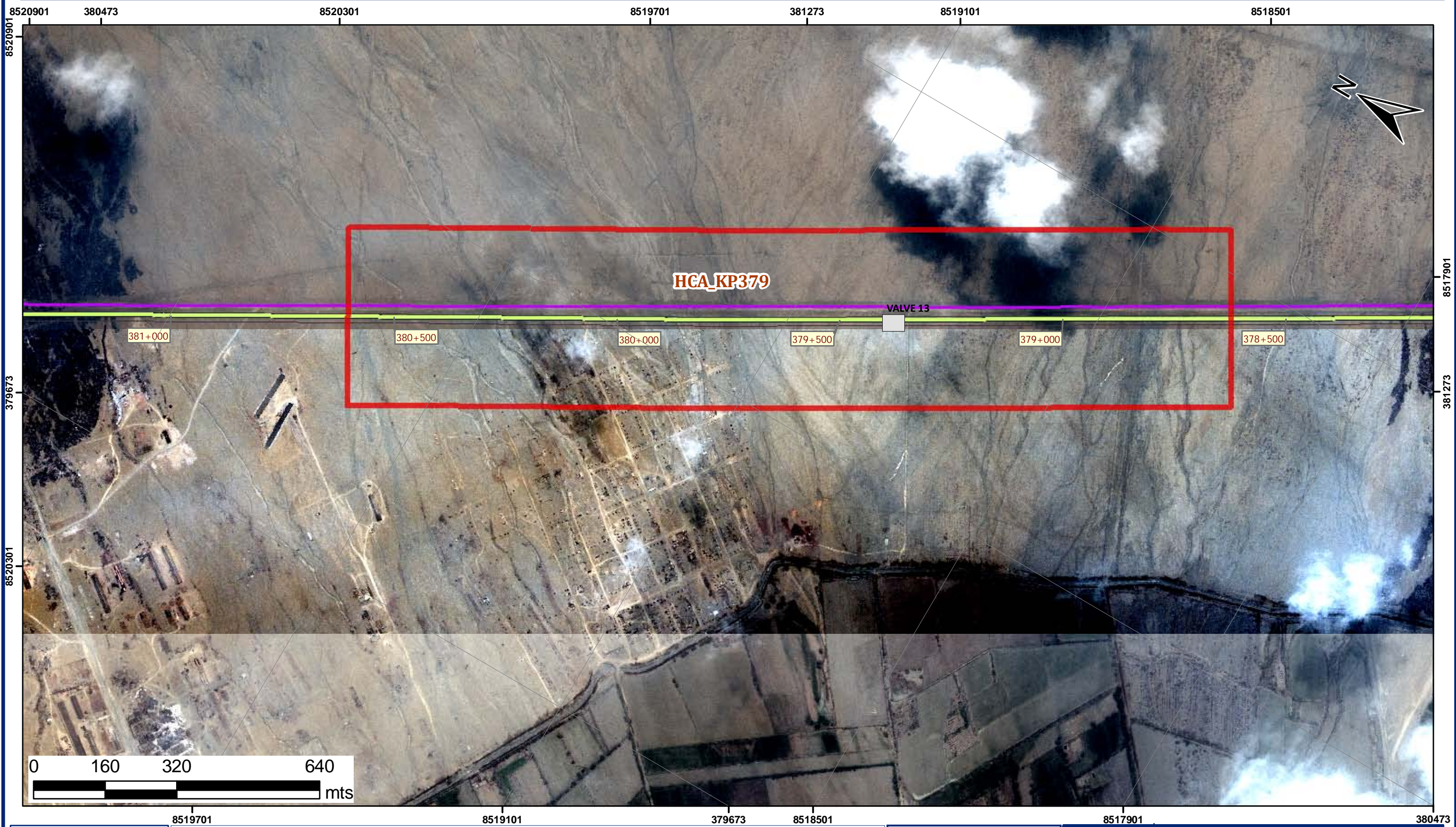
## INFORMACIÓN

Fuente:  
- Instituto Geográfico Nacional.  
- Instituto Nacional Estadística e Informática.  
- Ministerio de Transportes y Comunicaciones.  
- Techint.  
- Imágenes Ikonos (periodo de toma 2010)

Referencia Espacial:  
- Datum WGS 1984  
- UTM 18 Sur

 <small>Compañía Operadora de LNG del Perú</small>		PERU LNG			
<b>TÍTULO:</b> <b>High Consequence Area (HCA) at Kp 379</b> <b>Area de Alta Consecuencia en Kp 379</b>					
Responsable: Luis Saez		Área Responsable: Pipeline		Elaborado para: Informacion	
Fecha: Mayo 2010		Escala: 1 : 8000	Elaborado por: COLP IT - GIS		Papel: A3





PUEBLO NUEVO  
ICA  
CHINCHA ALTA  
SUNAMPE  
ALTO LARAN

### LEYENDA

Gasoducto PERU LNG	Valvula PERU LNG	Area de Alta Consecuencia (HCA) 200m
Gasoducto TGP	Derecho de Via (20 m)	

### INFORMACIÓN

Fuente:

- Instituto Geográfico Nacional.
- Instituto Nacional Estadística e Informática.
- Ministerio de Transportes y Comunicaciones.
- Techint.
- Imágenes Ikonos (periodo de toma 2007-2008)

Referencia Espacial:

- Datum WGS 1984
- UTM 18 Sur

<b>TÍTULO:</b> High Consequence Area (HCA) at Kp 379 Area de Alta Consecuencia en Kp 379		
Responsable: Luis Saez	Área Responsable: Pipeline	Elaborado para: Informacion
Fecha: Mayo 2010	Escala: 1 : 8000	Elaborado por: COLP IT - GIS
		Papel: <b>A3</b>





LEYENDA

Gasoducto PERU LNG

Gasoducto TGP

Valvula PERU LNG

Derecho de Via (20 m)

Area de Alta Consecuencia (HCA) 200m

INFORMACIÓN

Fuente:

- Instituto Geográfico Nacional.
- Instituto Nacional Estadística e Informática.
- Ministerio de Transportes y Comunicaciones.
- Techint.
- Imágenes Ikonos (periodo de toma 2005-2006)

Referencia Espacial:

- Datum WGS 1984
- UTM 18 Sur

PERU LNG

TÍTULO:

High Consequence Area (HCA) at Kp 379  
Area de Alta Consecuencia en Kp 379

Responsable:

Luis Saez

Área Responsable:

Pipeline

Elaborado para:

Informacion

Fecha:

Mayo 2010

Escala:

1 : 8000

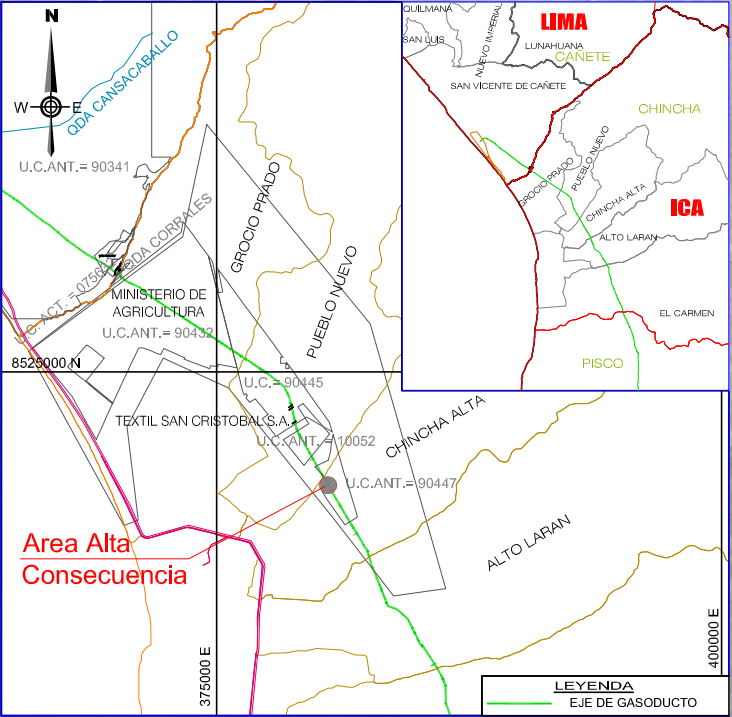
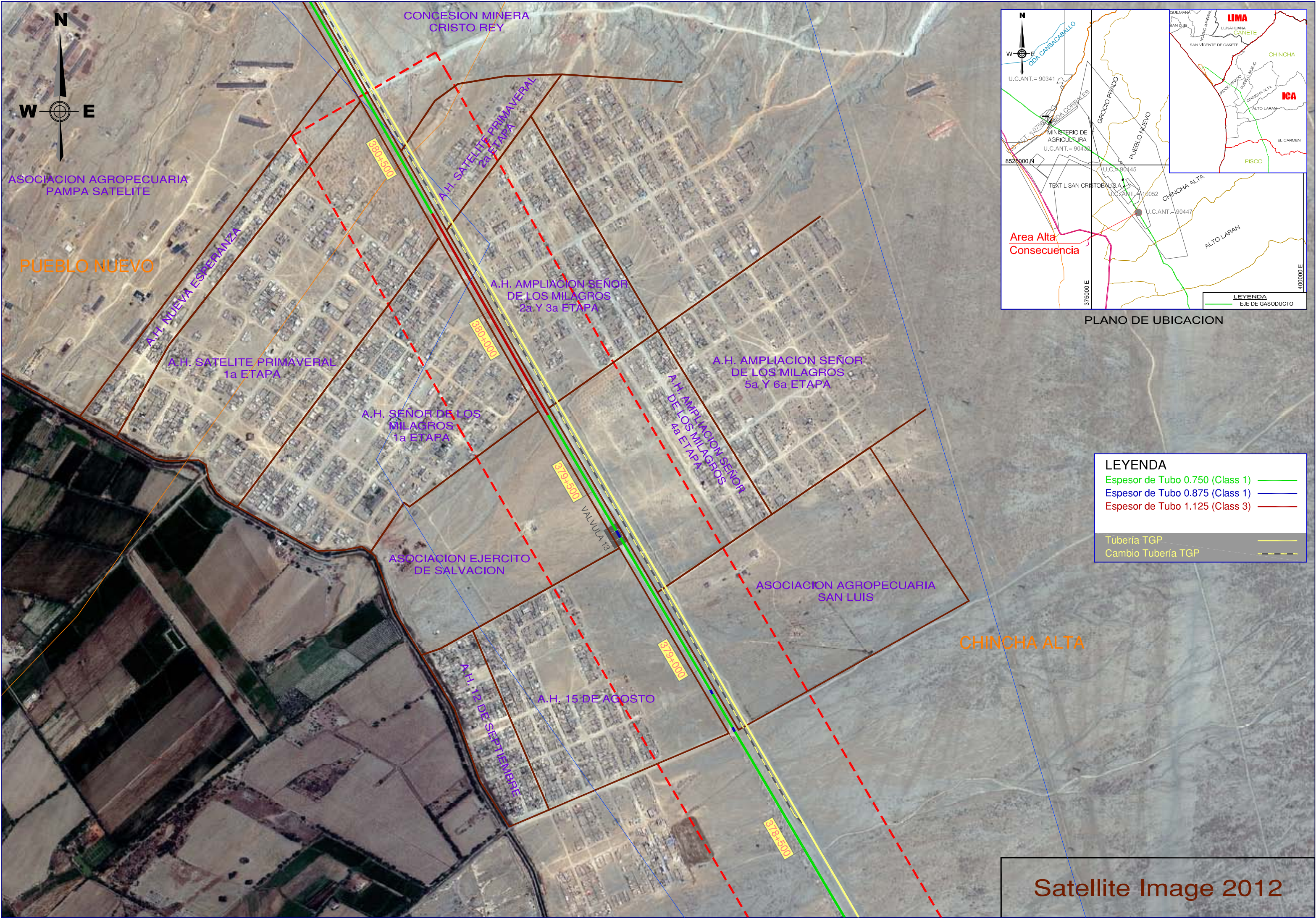
Elaborado por:

COLP IT - GIS

Papel:

A3





PLANO DE UBICACION

LEYENDA




- Espesor de Tubo 0.750 (Class 1)
- Espesor de Tubo 0.875 (Class 1)
- Espesor de Tubo 1.125 (Class 3)
- Tubería TGP
- Cambio Tubería TGP

Satellite Image 2012



**Annex III**

**PHOTOGRAPHIC DOCUMENTATION**

PHOTOGRAPHIC REPORT ON PLANT AND PIPELINE INFLUENCE AREAS AND COMMUNITIES APRIL 2013	
MELCHORITA PLANT – COASTAL AREA OF INFLUENCE	
	<p><b>Picture Nr. 1</b>            New settlement rapidly growing along the Panamericana (South) Road, nearby the Melchorita Plant. Although not formally recognized, the new settlements are undergoing a process of formalization through governmental provision of services such as electricity and schools. No encroachment on PERU LNG buffer zone has taken place.</p>
	<p><b>Picture Nr. 2</b>            Idem.</p>
	<p><b>Picture Nr. 3</b>            Idem.</p>



**Picture Nr. 4**

CONDORAY headquarters in Cañete: Julio Rojas (PERU LNG Director of Social Management and Milagros Panta Monteza (CONDORAY, Executive Director) responsible for the Technical Assistance Program to businesses established by affected Fishermen with the compensation provided by PERU LNG.



**Picture Nr. 5**

Dina Celi, Patricia Munian (CONDORAY staff) and Maria DaCunha (BID Social Specialist)



**Picture Nr. 6**

Mr. Alejandro Hernandez, his wife (right) and his brother (left). The two men who have fished for almost 50 years and were founders of the first fishermen association in Tambo de Mora; both were affected and compensated by PERU LNG and jointly used their compensation to establish a hardware store in Tambo de Mora; their business is one of the 569 receiving technical assistance from PERU LNG (provided by CONDORAY/PROSAP); the two brothers declared to be satisfied with the assistance given by PERU LNG/CONDORAY.

	<p><b>Picture Nr. 7</b></p> <p>Mr. Antonio Loyora (75 years old); also one of the first fisherman from Tambo de Mora; Mr. Loyora was affected and compensated by PERU LNG project. Her daughter graduated in community basic medical attention. With compensation he and his daughter established medical first aid service that benefits the Tambo de Mora community; their business is one of the 569 receiving technical assistance from PERU LNG (provided by CONDORAY/PROSAP); both declared to be satisfied with technical assistance provided by PERU LNG/CONDORAY.</p>
	<p><b>Picture Nr. 8</b></p> <p>Location of the first aid medical services facility in Tambo de Mora.</p>
	<p><b>Picture Nr. 9</b></p> <p>Mr. Atunka, a fisherman affected by PERU LNG project. In the back, some of the geoses fed with peanuts; both spouses declared to be satisfied with the assistance given by PERU LNG/CONDORAY. He continues fishing to complement family income.</p>





**Picture Nr. 10**

Mrs. Atunka, fisherman's wife. With the compensation she and her husband open a peanut business; she is here drying a recently harvested peanut crop that will be sold in Lima. Part of the crop is used to feed domestic animals (see geese below) and the rest is exchanged for milk and eggs at the neighborhood.



**Picture Nr. 11**

Example of CONCORAY Final Technical Assistance Report, issued per each one of the 569 attended commercial businesses established by affected fishermen with the compensation received from PERU-LNG.



**Picture Nr. 12**

Example of Compliance Act, dully signed by each fisherman after completion of technical assistance provided by CONCORAY/PROSAP to his/her commercial business, whereby beneficiaries: (1) acknowledge PERU-LNG compliance with compensation agreements; (2) express satisfaction with technical assistance received and (3) discharge PERU-LNG from any further obligation within the Fisherman Compensation Plan agreed upon between the parties.

**MOUNTAINS PIPELINE AREA OF INFLUENCE**  
**PEASANT COMMUNITY OF HUAYTARA**



**Picture Nr. 13**

Mountains Peasant Community officially recognized by Law 26506 of 1982 (Peasant Communities Law) the CC Huaytara holds collective land tenure rights; it has 380 "Comuneros" and about 4,000 persons. The CC Huaytara is located in the Huancavelica Region. Some of its high altitude communal lands were affected by the gas pipeline (Stretch 2: KP 105 – KP 269).

The blackboard shows pictures of communal productive initiatives being undertaken by the community with support of Banco Rural and FINCA programs, several of them also supported by PERU LNG.



**Picture Nr. 14**

Roberto Junior, Huaytara Community President, accompanied by community leaders during the visit paid by Peru LNG staff, lenders and Walsh representatives. Community leaders manifested gratitude and satisfaction for support received from PERU LNG.



**Picture Nr. 15**

View of the main village (CC of Huyatara).



**Picture Nr 16**

Panoramic view of Huaytara Village. In the back the community highlands can be appreciated as well as the gas pipeline ROW affecting 52.5 Ha. Although community leaders expressed concern and reported a slow or no recovery of pastures along the high sections of the ROW, this community also owns lands, pasture and crops in lower altitude, which reduce the impact of the pipeline in the community livelihood. In addition Peru LNG is providing support to various productive initiatives. See Pictures No.17 to 19.



**Picture Nr. 17**

Panoramic view of Hyatara from slops being planted with TARA with provision of plants and materials provided by PERU LNG.





**Picture Nr. 18**

Community leaders and members showing lenders and Walsh representative the plantation or TARA at 3,800 meters above sea level.



**Picture Nr. 19**

Recently planted Tara Plants. For the Tara cultivation, the Huaytara Peasant community is installing an incipient aspersion irrigation system bringing water from a far-away creek; the irrigation system is also supported by PERU LNG which has provided hosepipes and other implements.

### PEASANT COMMUNITY HUAYRACASA



**Picture Nr. 20**

Entrance to Paccta Annex. A Quichua speaking community located at 4,000 meters above sea level with collective lands affected by the gas pipeline. Community members prepared to receive PERU LNG and Lenders' representative to celebrate the completion of a school built with the support of PERU LNG.



**Picture Nr. 21**

School inaugural ceremony. At the center (back) Mr. Marcelino Condori, Community President, accompanied by Ramiro Yamoha, Deputy Major, community leader.






**Picture Nr. 22**

Ramiro Yamohan Rodriguez, Community Deputy Major inaugurating the school and expressing gratitude to PERU-LNG on behalf of the Paccta community. Once the school is furnished and once regional authorities assign a teacher, Paccta children will not have to walk one hour to attend school



**Picture Nr. 23**

Commemorative Plaque, with the names of community leaders, PERU-LNG representatives and the engineer contractor that built the school facility.

	<p><b>Picture Nr. 24</b> Carlos Hinostroza, PERU-LNG Director of social programs - Sierra 2 with a present woven by community women to express the community gratitude.</p>
	<p><b>Picture Nr. 25</b> Members of the Paccta community. A woman and her child.</p>
	<p><b>Picture Nr. 26</b> Children from Paccta who will be benefited by the new school.</p>





**Picture Nr. 27**

Vinchos Major and his wife, honor invitees to the inauguration of the new school who as a contribution brought tables and chairs for the school.

The Major also expressed gratitude to PERU-LNG for support given to all districts and communities.



**Picture Nr. 28**

Pasture lands located by the side of the access road to Paccta community.



**Picture Nr. 29**

Idem. Although located at high altitude the land has pasture suitable to feed the community animal stock (Alpaca and Llamas).



**Picture Nr. 30**

Paccta lands, surrounding the community settlement. In the back, a section of the 21 km long PERU-LNG pipeline Right of Way that crosses Paccta communal lands.



**Picture Nr. 31**

Community members in front of the community center; in the back a section of the gas pipeline RoW can be appreciated.



**Picture Nr. 32**

PERU-LNG Right of Way; community members expressed concern due to lack of pastures in the RoW. The area affected in this community is about 52.5 Ha.





**Picture Nr. 33**

View of the gas pipeline RoW. At the center a lender's representative.

## FIELD PHOTOGRAPHIC REPORT - APRIL 2013

### MELCHORITA PLANT



**Picture Nr. 1 -** Wastewater treatment plants (known as "Ex-CBI"). They used activated sludge to get a high rate of waste material degradation, which showed good results during the construction phase.




These treatment plants need to be rehabilitated to treat domestic wastewater.



**Picture Nr. 2 -** Wetland for tertiary wastewater treatment. This wetland was built during the construction phase and has been used during the operations phase. Vegetation has been mown to favor nutrients (Nitrogen and Phosphorus) absorption by the plants.

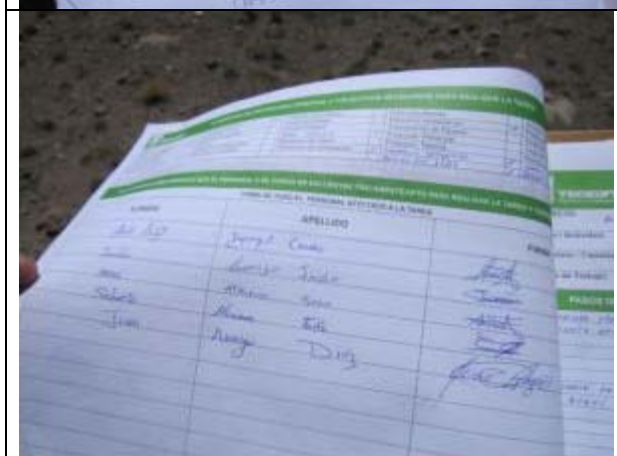


**Picture Nr. 3 -** Portable toilets are used in places where there is no sewage collection system; and where there is maintenance works. Tanker trucks are used to collect sewage from these points.

	<p>Picture Nr. 4 – Techint personnel (COGA contractor) wearing the appropriate PPE for the work being carried out. (KP 129+100)</p>
	<p>Picture Nr. 5 - Rigid pallet for transportation of an injured person. (KP 129+100)</p>
	<p>Picture Nr. 6 - First aid materials and medicines of a licensed nurse. (KP 129+100)</p>



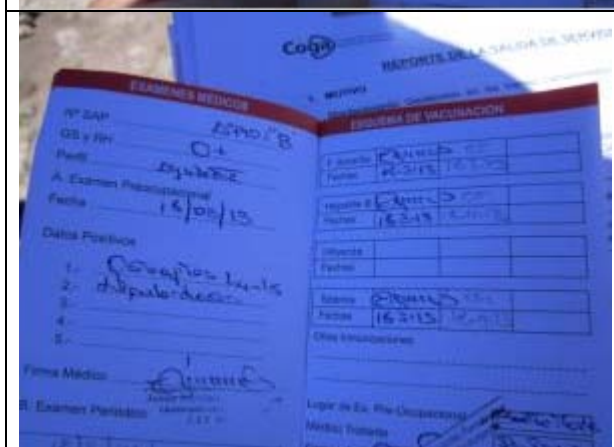
Pictures Nr. 7, 8, and 9 - Job Safety Analysis (JSA) are used to describe work procedures in order to avoid unexpected unsafe actions. The document describes potential risks associated with a task, as well as control measures to avoid accidents. (KP 129+100)









Pictures Nr. 10 and 11 - This is a medical pass, where medical evaluations and vaccines are registered in order to control worker's medical registries. (KP 129+100)



Pictures Nr. 12, 13, and 14 - Examples of impact to artworks to control erosion caused by rain and detected with monitoring programs in order to withstand future rains. (KP 124-134+500)



	
	<p>Pictures Nr. 15 and 14 – View from helicopter. Pictures of areas where the RoW is seen due to low plant cover recovery. The second picture shows areas where the RoW cannot be seen from the air as the plant cover within the RoW is similar to the one of its surroundings.</p>
