ZOFNASS PROGRAM
FOR SUSTAINABLE INFRASTRUCTURE
Graduate School of Design
Harvard University

Graduate School of Design
Harvard University
George Gund Hall
48 Quincy Street
Cambridge, MA 02138
December 5, 2014 - REV. 0
May 19, 2015 - REV. 1

MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL (MNT) IN THE PORT OF CALLAO, LIMA PERU

Figure 1: Modernization Project of the Multipurpose North Terminal (MNT) /Sources:www.pathfind.org/html/Worldwide/images/Peru.GIF

Dr. Axel Becerra Santacruz y Maria Ignacia Arrasate prepared this case study under the supervision of Cristina Contreras ENV-SP and Judith Rodriguez as part of the Harvard-Zofnass program directed by Dr. Andreas Georgoulias by initiative of IDB for the purposes of research and education. Editing and Proofing: Laurel Schwab

The authors would like to thank Ana Maria Vidaurre-Roche member of IDB for her leadership role in the IDB Infrastructure 360 Awards Project and Astrid Zoeger of ATP Terminal el Callao for their input; this case would have not been possible without their contribution

1. PROJECT DESCRIPTION & LOCATION

The Multipurpose North Terminal (MNT) is located in the Constitutional Province of Callao, in a wide bay on the central Pacific coast of Peru 15 km away from the capital city of Lima. The coast of Callao has a lot of port activities due to flourishing trade and an important fishing industry. The natural characteristics of the site are almost completely altered and modified, either by the port facilities, or by the urban population of the district of Callao. The project is currently in the construction phase of stages 1 and 2 of modernization, with around 50% completed. It is planned to finish the construction works by 2015. The full modernization project will be finished in 2022 and will represent an approximate investment of $800 million.

The geographical location and configuration of the coast of Peru that presents winds blowing from the south-- predominantly parallel to the coast-- make it one of the most privileged riverine countries in the world where coastal upwelling develops intensity. This phenomenon produces rapid growth of phytoplankton supporting the important ecosystem; consequently the area is responsible for more than 50% of fish production.

At the projects' site, rainfall is virtually nonexistent except in the winter months, when it receives a minimal amount of rain. The temperature is generally determined by the thermal inversion phenomenon characteristic of the central coast and south of Peru. The presence of El Niño in 1997 and 1998 has resulted in a monthly average temperatures increase. In terms of natural risks, earthquakes causing also tsunamis, whose waters reach the flood zone where the project is located, have affected the region.

The history of the port facilities at the Callao Bay dates back to colonial times. The port of Callao was built between 1828 and 1875, at which point it was a small dock for ships up to 20 feet deep. In 1934, the port was expanded adding additional docks. The Port of Callao is the main cargo-handling terminal of major importance to the Peruvian economy, and was previously operated by ENAPU S.A. The Modernization project of the Multipurpose North Terminal in the Port of Callao (MNT) belongs to the Government of Peru, which signed a 30 year concession agreement with APM Terminals Callao S.A., from 11 May 2011 to 11 May 2041, for the improvement and management of the port. The timeframe for construction is 10 years and the timeframe for operation is 20 years. In terms of investment, the estimated cost is US $750 million, including terrestrial and aquatic areas, which are equivalent to 121.9 Hectares (Ha). The project employs a total of 1,300 workers Including regular and dockworkers.

APM Terminals Callao SA has proposed to modernize the port infrastructure and equipment in order to adapt to the demands of the present freight system and the growing dimensions of the

ships, as well as to provide better performance. In terms of sustainability, APM implemented an intensive program of social responsibility to ensure the inclusion of surrounding communities in the project. The program includes projects in three areas: Education, Health, and Infrastructure. More than 20 initiatives of social responsibility have been already implemented. In addition, the company is focused on performing port operations with minimal environmental impact, including the use of electrical cranes for cargo transportation, and implementing high standards of security for workers. The environmental management plan of the MNT includes a monthly and quarterly monitoring program for air quality, vibration, noise, seawater, marine sediments and biological evaluation of wildlife in the area of direct influence. Specifically, they implemented programs for waste recycling and environmental site remediation.

2. APPLICATION OF THE ENVISION RATING SYSTEM

The Envision™ system is a set of guidelines that aid in optimizing the sustainability of an infrastructure project during the planning and preliminary design phases, as well as a means to quantify the relative sustainability of the project. In this case study, the infrastructure to be assessed is the Modernization Project of the Multipurpose North Terminal (MNT) in the port of Callao Peru.

Envision consists of 60 credits grouped into five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk. Each credit pertains to a specific indicator of sustainability such as reducing energy use, preserving natural habitat, or reducing greenhouse gas emissions. Those credits are rated on a five-point scale referred to as a 'level of achievement': 'improved', 'enhanced', 'superior', 'conserving', and 'restorative'. Evaluation criteria are provided to determine if the qualifications for each level of achievement have been met for a particular credit. In each of the five categories there is a specific credit called "Innovate or exceed credit requirements". This is an opportunity to reward exceptional performance that applies innovative methods within the subjects that Envision evaluates.

The criteria for the levels of achievement vary from credit to credit, but generally an 'improved' level of achievement is awarded for performance that slightly exceeds regulatory requirements. 'Enhanced' and 'superior' levels indicate additional gradual improvement, while 'conserving' often indicates performance that achieves a net-zero or neutral impact. 'Restorative' is the highest level and is typically reserved for projects that produce an overall net positive impact. The Envision system weighs the relative value of each credit and level of achievement by assigning points. Credit criteria are documented in the Envision Guidance Manual, which is

available to the public on the ISI[1] and Zofnass Program[2] websites.

3. QUALITY OF LIFE CATEGORY

Envision's first category, Quality of Life, pertains to potential project impacts on surrounding communities and their respective wellbeing. More specifically, it distinguishes infrastructure projects that are in line with community goals, clearly established as parts of existing community networks, as well as consider the long-term community benefits and aspirations. Quality of Life incorporates guidance related to community capacity building and promotes infrastructure users and local members as important stakeholders in the decision making process. The category is further divided into three sub-categories: Purpose, Wellbeing, and Community.

Purpose

Within Purpose, Envision addresses the functional assets of communities, such as development and employment opportunities. In two years, the modernization of the Port of Callao not only created new jobs as a result of the delivered infrastructure, but it also expanded the socio-economic opportunities for the community by implementing social programs.

In terms of growth and development, APM Terminals Callao had promoted local employment and working opportunities to ensure maximum resident involvement in the project's area of influence. Consequently, APM Terminals has hired a large number of local workers, who are also trained through several courses in the in-house Training Center. In this way, new personnel are not only trained but also they have the opportunity to keep developing their skills further through technical studies.

In terms of social programs, APM Terminals Callao team had identified in detail the direct and indirect area of influence of the project, mapping all relevant interest groups within the community. The most influential organizations identified-- neighborhood associations-- pointed out security and employment as key issues.[3]

[1] www.sustainableinfrastructure.org

[2] www.zofnass.org

[3] Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao, Estrategias de relacionamiento comunitario con stakeholders, Marzo 2014.

Consequently, APM Terminals Callao implemented an intensive program of social responsibility to ensure the inclusion of surrounding communities in the project. The program includes projects in three key areas: Education, Health, and Infrastructure. As a result more than 20 initiatives of social responsibility have been already implemented. In addition, the company is focused on performing port operations with minimal environmental impact.

Notwithstanding the efforts by APM to include the communities and address their needs, there are still efforts to be made. A large sector of the population in the indirect area of influence is not fully aware of the company's activities or the type of work they do, nor its relationship with the government. The uncertainty among the population about the role of the company creates misperceptions about their future, specifically whether the port's expansion could displace some of the most vulnerable populations in the surrounding area. Reconciliation between the industrial use of land in the port area and the residential use in surrounding communities is a matter to be resolved. A more holistic understanding of the port's impact and a consideration of stakeholder participation could not only open an opportunity to mitigate many of the negative impacts of the project, such as heavy traffic and noise, but also integrate local voices and stronger local allies for further planning measures and infrastructure updates.

Community

The Community subcategory addresses issues related to comfort, health and mobility of local communities as well as project workers. APM Terminals Callao has placed safety as an integral part of the planning process.

In terms of security, ATP implemented a very strong program within its premises, which includes new technologies such as a personalized TAG system for all workers and new electric cranes, offering better standards of security. Additionally, the security program integrates new methodologies and campaigns for safety and awareness in order to achieve their goal of zero accidents or fatalities. APM provides health support to all employees, including an annual medical examination and family health insurance. This safety benchmark goes beyond the Peruvian regulatory requirements.

Other important aspects that the project has considered are mobility and connectivity in the area. Currently several major roads connect Lima and Callao. There is the Central Railway station, which mainly transports minerals from central Peru. Trucks mostly travel the roads, transporting minerals and economic goods to the docks and ports, but commuters also use these same roads, causing major traffic and congestion. Therefore, the impact of the project in relation to community access and mobility is still a matter to improve. Even though upgrades to existing roads and a new access point were taken into consideration to facilitate traffic in the

port area, aspects such as community walkability and livability were negatively affected due to high levels of violence in the areas surrounding the port. Until the safety issue is solved, the project team recommended avoiding walking during nighttime to prevent any incidents. APM Terminals Callao hired a special transport system for all employees to avoid incidents. APM Terminals and the police officers in the area are making a special effort, with two police emergency stations in the vicinity of the port. Nevertheless, this issue remains unsolved.

Despite the efforts of APM to look after the security and health of their employees, there are also other issues-- such as the lead pollution related to port operations-- still waiting to be addressed. The high level of security standards and the design strategies utilized in the project need to be expanded into adjacent neighborhoods. Mobility and accessibility impacts due to the increase of heavy traffic are still matters to improve, and connections to public transportation remain limited.

Wellbeing

The Wellbeing subcategory covers the visual and functional impacts of infrastructure projects on their immediate surroundings. The historical industrialization of el Callao and the surrounding areas of the port have completely altered the natural landscape of the area. In this sense, the design of the new administrative building and other construction related to the port modernization were integrated into the predominant industrial landscape, creating a coherent aesthetic by merging the new buildings with the old ones.[4]

However, there is an opportunity to develop a more comprehensive analysis of the port industrial facilities constructed since 1828 until today; in order to inform a heritage plan incorporating a contemporary history of how those facilities had been integrated into the modernization of the port. An archaeological assessment was conducted at the project site, and one water tank structure was declared as cultural heritage and given to the government for relocation. However, even though archeological studies for historical and cultural preservation were developed, there is an opportunity to inform future actions with a contemporary narrative recognizing present industrial history on the site.

In addition, it will be a key to consider the integration of community views in order to better understand the local character and find ways to resolve the existing tensions between the project and its context. As an example, public spaces play an important role in community

[4] Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao, Estrategias de relacionamiento comunitario con stakeholders, Marzo 2012.

functions and social cohesion, therefore, improvements in existing public spaces or the creation of new ones should be considered as part of the programs that APM is implementing.

4. LEADERSHIP CATEGORY

Leadership evaluates project team initiatives that establish communication and collaboration strategies early on, with the ultimate objective of achieving sustainable performance. Envision rewards stakeholder engagement as well as encompassing a holistic, long-term view of the project's life cycle. Leadership is distributed into three sub-categories: Collaboration, Management, and Planning.

Collaboration

The Collaboration subcategory acknowledges that sustainable projects must include input from a wide variety of stakeholders to fully understand synergies and opportunities. Considering the impact of this project, the management structure integrates different instances of participation and collaboration to gather the opinions of all stakeholders involved, including the affected population, suppliers and contractors.

The Annual Sustainability Report of APM[5] demonstrates leadership and commitment to address the economic, environmental, and social goals of the project. In two years, APM Terminals Callao has developed various strategies to strengthen environmental management, such as monthly and bimonthly monitoring of air quality, vibration, noise, seawater, marine sediments and biological evaluation of wildlife in the area of direct influence. In addition to these initiatives the collaboration agreements signed with public institutions and local stakeholders, such as a joint project to improve the quality of life of artisanal fishermen in the area, provide support to the ongoing efforts of APM regarding sustainability beyond the scope of the project. The project affects a broad area of direct and indirect influence; therefore, the management structure is key to achieve sustainability objectives.

Since beginning, the project team implemented a social program aiming to generate a process for partnerships and networking with stakeholders in order to support local sustainable development. With that purpose in mind, the identification of all stakeholder groups was conducted and information was exchanged for broader involvement and communication.[6]

[5] Reporte de Sostenibilidad, E- Auctions, Julio 2011-Junio 2013.

[6] Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. *Capitulo 3: Area de Influencia.*

Although clear leadership and commitment has been demonstrated and roles and responsibilities are clearly defined, the coordination among the project's authorities is not clear. There are still opportunities and synergies between different areas able to be explored. As an example, the project provided various instances of participation from all stakeholders involved in the project, but it is not clearly identified how those opinions are translated in the decision making process. A stronger collaboration with the identified local stakeholders can lead to restored environmental conditions by expanding further actions in the indirect area of influence, where problems such as lead pollution and insecurity among the population are affecting the daily life of the port's neighbors.

Management

The Management subcategory assesses the detailed understanding of the project that will allow the team to see and pursue synergies between systems. An innovative way of managing and understanding the project as a whole can lead to monetary savings, increased sustainability, expanded useful life of the project and protection against future problems. In terms of infrastructure integration, the project management team has been able of integrating the old city's existing infrastructure with the port. The project has remedied the space of the previous port installations and the former railway station, integrating them into the port area in order to facilitate cargo operations. This strategy has been implemented for long-term sustainable aims. Another management initiative relates to the Solid Waste Management Plan. Wood and metals waste resulting from the port's operations are segregated and subsequently marketed by authorized companies. As a result, 236 tons of waste were recycled in 2013.[7]

However, additional management efforts are needed in order to solve actual and potential future issues. The resolution of the conflict between the heavy traffic related to the port activity and the light traffic in the residential neighborhoods is an urgent matter. The connection between public transportation systems and the port has been identified as an opportunity for improvement. Solutions out of the scope of the project such as the construction of an elevated highway for heavy traffic are mentioned, but no concrete actions have been taken. In terms of by-product synergies further studies and assessments could help to identify

[7] FCC JJC. Plan de manejo de residuos sólidos. Enero 2014 & APM Terminals. Plan de Manejo de Residuos 2014 del Terminal Norte Multipropósito en Puerto del Callao. Enero 2014.

opportunities to use waste products from one facility into the project. This cost-effective strategy could be integrated during the operation phase of the project or during future phases of construction and expansion. Finally, constructive discussions with Peruvian regulatory agencies are recommended in order to foresee potential conflicts with existing regulations.

Planning

The Planning subcategory identifies the importance of a long-term view in order to achieve a more sustainable outcome.

The port operations concession contract has a duration of 30 years, including the construction phase during the first 10 years. However in terms of planning, the modernized port has been designed to last at least 50 years and is expected to last 100 years. Therefore, the project has taken into account strategies required for current operation and beyond, as well as the acquisition of the largest and most modern crane for long-term operation. These specific considerations allow for expanded functionality of the port beyond the point of delivery, Moreover, the economic growth of Peru in recent decades indicates that the design of the port considered expansion and reconfiguration; therefore, both operation and construction addresses the possibility of future changes in use or capacity.

The security programs, constant inspections and equipment maintenance schedule implemented by APM ensure that the design performance of the overall port activities will be maintained throughout the lifespan of the project.

One of the key issues taken into consideration is the identification of conflicting regulations that can create barriers to the implementation of new practices. While assessing the regulations to be applied to the project, APM detected two potential conflicts between the existing regulations and the company's efforts to improve performance; therefore the team approached Peruvian authorities to devise alternatives to address these issues. In terms of the port workers, APM is in conversations with the Peruvian Ministry of Work to modify existing laws with the objective of providing more stability to their employees. APM is also lobbying political authorizes to allow the entry of international companies into Peruvian ports, which is forbidden by the current Cabotage law. The company believes this is a sustainable solution that will benefit the country, generating more trade in the provinces and investment in its ports. However, it is important don't equating 'sustainable solution' with a pure economic metric, which would be very antithetical. Such a solution would only be 'sustainable' if it fosters well-being, community, equality, environmental balance, etc. in addition to any economic benefit.

Considering the 30-year concession contract and the future expansion of the port's lifespan beyond the concession period, there is an opportunity for evaluation in future stages of the project in relation to climate change. As an example, flexibility to enable reconfiguration and

refurbishment in the project should be included. This will enhance resilience in case of extreme events and the durability of the new infrastructure. It is also recommended to include a feasibility study to identify the key areas where increasing investment in extending useful life of the port offers a reasonable payback. It is also necessary to develop tools ad metrics that evaluates the impact of this sustainable solution beyond economic benefit and fosters well-being, community, equality, environmental balance, etc.

5. RESOURCE ALLOCATION CATEGORY

Resource allocation deals with material, energy, and water requirements during the construction and operation phases of infrastructure projects. The quantity and source of these elements, as well as their impact on overall sustainability, is investigated throughout this section of the Envision rating system. Envision guides teams to choose less toxic materials and promotes renewable energy resources. Resource Allocation is divided into three subcategories: Materials, Energy, and Water.

Materials

Minimizing the total amount of material used should be a primary consideration for infrastructure projects. Since its conception, APM Terminals Callao has designed this venture to minimize its environmental impact. In addition strong Peruvian environmental and waste management laws, were adding and extra challenge to fulfill specific requirements in this field. As a result the project included a strong set of design specifications for land restoration, waste management, recycling and use of regional materials in order to support sustainability aims. In other words it is important to distinguish between real sustainability work and what is needed to remain regulatory. In this sense envision rates efforts are over and beyond compliance.

Waste management and recycling procedures are clearly described in the Plan de Manejo de Residuos Sólidos (Waste Management Plan), which was developed by a third party. This set of specifications describes a clear process for waste management at different levels that includes analysis of waste generation, collection according to clear classification of waste, disposal according to specified classifications, and special treatment for dangerous or toxic waste. At the same time the plan included training for all construction workers in order to ensure correct implementation of all the specifications. A third party, formed by the waste management

consultancy group and The Agency for Environment, has been able to verify a high level of achievement in the recycling of materials.[8]

In regard to sustainable procurement practices and use of local materials, APM Terminals Callao implemented an innovative system entitled E-Auctions for materials and equipment purchase. The system aims to achieve more transparent and efficient transactions, reducing cost and time, making APM Terminals Callao one of the regional leaders in electronic and open procurement practices.

Although clear leadership and commitment has been demonstrated, to keep improving sustainability goals in terms of materials the next step will be to consider the Net Embodied Analysis Assessment as a design strategy, which will be essential to understanding life cycle considerations during future expansions.

Energy

Reducing overall energy use is crucial, particularly from non-renewable fossil fuel sources. In this respect APM Terminals Callao is one of the global leaders promoting the use of renewable energy sources in port operations. Taking advantage of their global experience, the project team implemented a new generation of port terminal cargo handling equipment, substituting previous diesel equipment and reducing energy consumption during operation and maintenance. The project aims not only for more efficient use of energy, but also the reduction of overall operation and maintenance costs through the project life cycle.

In addition, taking advantage of their experience in port operations around the globe, the project team implemented an energy systems monitor in each port terminal cargo handling equipment, which allows monitoring of the performance of energy consumption during operation. Finally, as part of the monitoring strategy, the project team contracted with Royal Haskoning and Ecotec as third party commissioning supervision.

The next step to improve sustainable standards will be to use energy consumption analysis to inform design strategies for project life cycle energy efficiency. This analysis will be useful to document empirical knowledge already developed by the project team, in order to develop

[8] FCC JJC. Plan de manejo de residuos sólidos. Enero 2014 & APM Terminals. Plan de Manejo de Residuos 2014 del Terminal Norte Multipropósito en Puerto del Callao. Enero 2014

further action towards a more efficient use of energy. At the same time it would be valuable to analyze a parallel source of energy supply from renewables such as wave energy production.

Water

It is a critical issue to reduce overall water use, particularly potable water. APM Terminals Callao has implemented a program to train employees to reduce overall water consumption. They are also considering implementing new technology to reuse and recycle water; however, the impact of these strategies is still low in terms of overall percentage of water consumption. There is an opportunity to develop an analysis of freshwater resources without replacing those resources at its source in order to reduce the negative net impact on freshwater availability in quantity and quality. There is also a chance to evaluate alternative water sources, such as recycling rainwater.

It is also encouraged to consider monitoring potable water systems as a design strategy to incorporate means to monitor water performance during operations. Furthermore, it is highly encouraged to make sure that seawater monitoring informs design strategies, making sure that for further development is not damaging natural marine habitats.

Such analysis will be essential to understand water life cycles, in order to evaluate feasibility and cost to determine the most effective methods for potable water reduction and avoidance of seawater contamination.

6. NATURAL WORLD CATEGORY

Natural World focuses on how infrastructure projects may impact natural systems and promotes opportunities for positive synergistic effects. Envision encourages strategies for conservation and distinguishes projects with a focus on enhancing surrounding natural systems. Natural World is further divided into three sub-categories: Siting, Land and Water, and Biodiversity.

Siting

The Siting subcategory acknowledges the fact that infrastructure should be sited to avoid direct and indirect impacts in areas declared to have high ecological value. Previously developed or disturbed land is ideal for development, to prevent further damage to the environment,

increase land value and remediate contaminated brownfields. The Terminal Norte Multipropósito del Callao project aimed to expand and improve old port facilities, avoiding a new project on additional land. In this sense the project has fulfilled one of their major contributions supporting the preservation of prime habitat by infilling already developed land rather than producing an additional ecological footprint on virgin lands. A third party study on environmental impact evaluation and activities demonstrates that no areas of prime habitat are located on–site or within the specified distance of development according to environmental law.[9]

The project's location is not identified as prime farmland of statewide importance according to the Environmental Impact Evaluation. Consequently, expansion and improvement of the old port facilities does not have negative an impact on the vegetation and soil protection zone. In addition, the project is not identified as an adverse geologic formation; however, by its nature as a port project, it inhabits coastal areas.

In order to further contribute to the preservation of prime habitat, the ATP team could promote local programs aiming to protect areas of prime habitat through restoration of vegetation within identified surrounding areas. They also have the opportunity to promote restoration of previously degraded buffer zones to a revitalized state on another previously developed site, in order to preserve prime farmland or restoration of farmland.

Land & water

Infrastructure projects should have minimal impact on existing hydrologic and nutrient cycles. Since the conception of the project this issue was one of the main challenges. As a result the project included the redesign and re-use of a site deemed a brownfield by local, state and federal government agencies. The brownfield remediation plan was carried out during the construction phase and prevents future water contamination by cleaning up previously contaminated land, restoring wellhead protection, and installing land use controls to prevent future contamination.

According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities) and the stormwater study, the project does not obstruct or have a significant impact on runoff quantity and quality, however infiltration, evapotranspiration, greenfield or water

[9] Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. *Capitulo 3: Area de Influencia.*

harvesting areas were not considered due to the small amount of annual rainfall in the coastal zone of Peru.

In order to have a deeper contribution to the Natural World criteria, the ATP team could study to promote local programs aiming to teach their workers and the local population about the impact of pesticides and fertilizers and to promote the consumption of organic products in local stores and restaurants. At the same time additional strategies of the plan could include spill and leak monitoring, runoff interceptors, drainage channels designed to accommodate pollutants in stormwater or ice melt, and potential spills and leakage. Finally, It is encouraged to document the empirical experience of brownfield remediation according to local techniques and local knowledge in order to identify the key contributions to the preservation of greenfields.

Biodiversity

Infrastructure projects should also minimize negative impacts on natural species and their habitats. This project presents multiple strategies for biodiversity protection; unfortunately there is very little evidence on biodiversity protection and support in action.

The team could take further actions on this field in order to decrease the impact on the biodiversity in the surrounding areas. More attention should be paid to the oceanfront and the impact of deep excavation for future larger ships. In order to have a deeper contribution to the Natural World subcategory, ATP could promote local programs aiming to preserve marine species biodiversity. Specifically, it is necessary to make sure that future development in the oceanfront does not damage natural marine habitat and that ship traffic does not cause lead pollution, which also can affect marine life.

7. CLIMATE & RISK CATEGORY

Envision aims to promote infrastructure development that are sensitive to long-term climate disturbances. Climate and Risk focuses on avoiding direct and indirect contributions to greenhouse gas emissions, as well as promotes mitigation and adaptation actions to ensure short and long term resilience to hazards. Climate and Risk is further divided into two sub-categories: Emissions and Resilience.

Emission

The Emissions subcategory aims to understand and reduce greenhouse gas emissions as well as other air pollutants during all stages of a project's life cycle. Reducing these emissions minimizes short and long-term risk to the life cycle of the project.

To measure the greenhouse gas emissions a long-term and comprehensive life cycle carbon analysis has to be conducted and this assessment should be used to reduce the anticipated amount of net greenhouse gas emissions. Unfortunately, APM Terminals Callao did not develop a life cycle carbon analysis. However, in terms of air pollutant reductions, even though the project is not following any specific regime such as the California Ambient Air Quality Standards, the project team identified that in a port terminal the key to reducing emissions is the cargo handling process. Consequently, the team implemented new generation equipment that works with electric energy, substituting previous diesel equipment. This has been resulted in carbon monoxide, nitrogen dioxide and ozone reductions. At the same time the operations include a new underground system to transport grain and other goods, further avoiding emissions. All of these measures have considerably reduced emissions compared to previous standards.

According to the Terminal Norte Multipropósito el Callao, there is a great opportunity to document greenhouse gas emissions in order to inform a long term and comprehensive life cycle plan to reduce greenhouse gas emissions during the 30 years contract period and beyond. It is also encouraged to adopt the California Ambient Air Quality Standards, to document air pollutants in a more rigorous way.

Resilence

The Resilience subcategory addresses the ability to withstand short-term risks, such as flooding or fires, and the ability to adapt to changing long-term conditions, such as changes in weather patterns, sea level rise, or changes in climate. Increased adaptability and decreased vulnerability ensures a longer useful life and ensures that the project will be able to meet future needs.

APM Terminals Callao considers a natural hazards emergency plan that covers certain climate threat issues. The project team and a third party assessment natural hazards identifying the risk of lying coastal areas as tsunami susceptible. Chemicals management was identified as a source of contamination during a tsunami or earthquake followed by fire or explosion risk. The plan provides a list of likely natural hazards for the next 25 years. Consequently, the port facilities includes a risk management and action in case of emergency (Plan de preparación y respuesta ante emergencias) in order to prevent damage and contamination, mainly to the ocean. This

sections gives the project a certain level of resilience. Different sections of this plan describe steps taken to improve protection measures, such as key installations and representatives for protection and risk management (the risk management and emergency committee), risk evaluation and levels of emergency according to natural hazards risks, operational procedures to prevent risk, and training and simulation according to different emergency cases. The procedures also include management of hazard areas, dangerous liquids management, and runoff controls. Finally, the plan is subject to revision and evaluation after every emergency.

Despite the aforementioned design strategies, the team did not consider a specific climate impact assessment beyond the 30-year concession agreement. Even though there is a risk management and action plan in case of emergency, its impact is still limited in terms of potential long-term traps, vulnerabilities and risk due to long term changes such as climate change.

Consequently, there is a great opportunity for the natural hazards plan (Plan de preparación y respuesta a emergencias) to evolve into a long-term comprehensive climate impact assessment and adaptability plan. This should include important design variables and associated assumptions used in the design of the project comparing those assumptions to the potential impacts of climate change over the design life of the project. Specifically identifying potential long-term traps, vulnerabilities and risk to the long-term changes during the 30-year operations concession and beyond. This plan should also identify and assess possible changes in key engineering design variables. It is also an opportunity to evaluate the port infrastructure system to be resilient to the consequences of long term climate change in order to inform performance under altered climate conditions or to adapt to other long term change scenarios. Finally, it is encouraged to study the levels of heat island effects in order to inform the project and implement specific strategies to minimize surfaces with a high solar reflectance index (SRI).

8. SUMMARY AND CONCLUSION

The Port of Callao is the main Terminal Cargo Handling of major importance to the Peruvian economy, this mega project involves an investment of more than US $750 million, the enlargement of the port's site from 53.6 ha to 89 ha, five stages of development, a substantial increase in the port's operations, and more than 1,300 employees.

During the Envision^{TM} system analysis, has been possible to evaluate the impact of this project investment through the performance of each one of the 60 credits grouped into the five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and

Risk. Each credit reflects specific indicator of sustainability during construction implementation and actual operation of the modernization project.

In synthesis, beginning with the Quality of Life key contributions of the project, outstands the impact on local growth and development through the creation local employment and work opportunities. In two years, the modernization of the Port of Callao not only created new jobs as a result of the delivered infrastructure, but it also expanded the socio-economic opportunities of the community. The project has also implementing social programs that include: support Local Development, Education, Health, and Infrastructure. As part of these programs, various initiatives had been implemented in alliance with the Municipality of Callao to benefit local population. Some of these worth to mention are the improvement of the children's nutrition, increase their attention level during class, and to ease the economic concerns of the beneficiaries of the program. Furthermore, APM conducted an environmental education program in the area schools, aiming to raise awareness and provide information to the local population on environmental issues and sustainable management of natural resources. To promote local entrepreneurship, APM and local leaders created a bakery, including equipment and training, to support the economic development of the area and provide new sources of employment to youth. In addition, to support small-scale fisheries in the project's area, APM and the local fishermen's associations implemented a plan to update their facilities and provide continuous training to improve their skills. These programs were defined in response to the needs raised by the community and local organizations.

As part of wellbeing subcategory APM Terminals Callao has placed special emphasis on implementing high safety standards to ensure that staff can perform their work without suffering accidents. The project integrated technologies and methodologies to ensure the health and safety of all involved in its phases of construction and operation, going beyond regulatory requirements. In order to reduce noise and vibration, APM Terminals Callao decided to purchase equipment with the latest technology in installations or machinery on the site (silencers, anti-noise barriers, shock absorbers). With these considerations, the project is within the acceptable levels of noise, during day and night hours, established by Peruvian noise norms (Decreto Supremo N° 085-2003-PCM).

Nevertheless in this field, there is still an opportunity to mitigate negative impacts generated by industrial activity within the community by identifying compatible land uses and setting policies for new development in the areas adjacent to the port where problems such as lead pollution and insecurity among the population are affecting the daily life of the port's neighbors. Besides the employees and workers are directly involved in the port activity, the project should

consider making a meaningful contribution to long-term competitiveness of the surrounding community. Therefore, the activities and training offered at the Training Center could be opened to others or replicated in local schools to provide new technical skills for the local youth. Finally, despite the efforts done to include women in the port activity, there is still a huge gap between male and female workers. Clearly, these social programs contribute to the capabilities and productivity of surrounding communities, but the impact of those programs is still not measured in the information provided.

Leadership thus managers have been responsible for maintaining the relationship with the various stakeholders through meetings, whether private or public. In addition, the team at APM Terminals Callao is an active member of several organizations, such as workers unions and community committees, which allows them to have a close relationship with all stakeholders. Within the social responsibility and collaboration different policies were implemented by APM diverse partnerships and networks with stakeholders to contribute to the program for local sustainable development had been developed.

The project has remedied the space of the previous port installations and the former railway station integrating them into the port area in order to facilitate cargo operations. The project has taken into account a deeper dredging than required for current operations, as well as the acquisition of the largest and most modern cranes. Even though the project design includes upgrades to existing roads and a new access point were taken into consideration to facilitate heavy traffic in the port area, aspects such as community walkability and livability were negatively affected. In other words the risk of accidents is higher among pedestrians in the area and there is a general sense of insecurity in the busiest streets. The aim should be to reduce the negative impacts of the project, creating quieter communities, resulting in the expansion of feasible uses of properties adjacent to the port and higher property values. This could also contribute to a reduction in the deterioration and violence present in the neighborhoods adjacent to the port activity. The participatory approach of the EMP denotes the concerns of the local community in relation to the consequences of increased traffic, such as air pollution and insecurity.

APM is trying to coordinate with local authorities and other companies in the area to elevate the road for port-related traffic, with the objective of separating that type of transportation from the residents of the affected neighborhoods. Nevertheless, it is recommended that in the short term, a comprehensive mobility plan in coordination with the affected communities be considered, in order to address pressing matters regarding safety and pollution. In the long term, strategic improvements including transportation efficiency, better access to public

transit, and the use of non-motorized transportation will contribute to improved community mobility and accessibility, reducing the negative impacts of the project in the surrounding neighborhoods.

Looking towards the future, the management system of the port of Callao should include policies to assure coordination among different management areas, and at the same time look for mechanisms to achieve a meaningful integration of the stakeholders. There is room to improve the depth and breadth of community participation in the port. Despite efforts made by APM in this realm, public participation is still mostly informative; however, the process should also be an opportunity to provide meaningful input to the project. In addition, the population attributes the increased movement of heavy vehicles and negative traffic impacts to port activity. Heavier traffic has worsened commuting times, acoustic and environmental pollution, and accidents

In terms of resources allocation the project has also made a great contribution, since the conception of the project included a strong set of design specifications for waste management, recycling and use of regional materials in order to support sustainability aims. Since February 2013 APM has had a waste recycling operation, having a positive return in economic, social and environmental costs contributing to the sustainable development of the organization and the community. Wood and metals waste resulting from the port's operations are segregated and subsequently marketed by authorized companies. During 2013, 236 tons of waste was recycled. In regard to sustainable procurement practices and use of local materials, APM Terminals Callao implemented an innovative system entitled E-Auctions for materials and equipment purchase during Port expansion and actual operations.

Although clear leadership and commitment has been demonstrated, to keep improving sustainability goals in terms of materials, the next step to improve sustainable standards will be to consider the Net Embodied Analysis Assessment, as a design strategies for life cycle energy design efficiency which will be essential to understand life cycle considering future expansion. At the same time there is an opportunity for further stage development of the E- Auctions methodology. Specifically, it is still not possible to measure the impact in quantitative terms beyond economic savings.

In terms of energy consumption, APM Terminals Callao implemented a new generation of Port Terminal Cargo Handling Equipment substituting previous diesel equipment in order to reduce Energy Consumption during operation and maintenance. According to the energy supply

contract all energy supply is coming from the Endevour hydroelectric plant located in the North area of Lima.

For future stages of the project in terms of resources allocation, design and construction standards and practices need to consider new problems arising from sustainability. Moreover, some of the systems currently in operation, such as water and electricity consumption for the port activities, could be modified or re-evaluated in other to reuse greywater or prioritize renewable energy sources. In order to implement these practices, further studies should be made regarding the existing regulations to avoid possible conflicts.

One of the key contributions of the project has been made to the Natural World category by expanding and improving old Port facilities, avoiding placing a new project on additional land. In this sense the project has supported the preservation of prime habitat by infilling already developed land rather than producing an additional ecological footprint on virgin lands. In these two years, APM Terminals Callao has also developed various strategies to strengthen environmental management, such as monthly and bimonthly monitoring of air quality, vibration, noise, seawater, marine sediments and biological evaluation of wildlife in the area of direct influence of the North Terminal to ensure the environmental control of the Callao Port.

Ironically, it is also within this category were the key challenges for future development requiring more attention. The project provides high evidence of protection and risk management and various evaluations to strengthen environmental management, unfortunately there is very little evidence towards Biodiversity protection and support in action. In other words, even so, the project is not situated on a site of ecosystem functions of streams, wetlands, water bodies or riparian and high evidence of monitoring on the oceanfront exist; the team has the opportunity to use this knowledge to inform more actively strategies towards Biodiversity. Specifically in further areas development were deep excavation will be needed for expansion to allocate larger ships. In order to have a deeper contribution to the Natural World. At the same time ATP team could promote local programs aiming to preserve Marine Species Biodiversity. Specifically, it is necessary to make sure that future development in the oceanfront does not damage natural marine habitat and that ship traffic does not cause water pollution by lead, which also can be affecting the marine life.

Finally, in the climate and risk category, according to the dimension of the operations of The Terminal Norte Multipropósito el Callao, the project did a great contribution by reduction of emissions of Air pollutants. The project team identified that in a Port Terminal the key to reduce emissions, is the Cargo Handling process but not life-cycle carbon analysis has been

conducted. The team implemented new generation equipment that works with electric energy substituting previous diesel equipment. Operations include a new underground system to transport grain and others goods avoiding emissions of different particles to the air such as carbon monoxide, nitrogen dioxide and ozone pollutants reductions. In this subject there is a great opportunity to document greenhouse gas emissions in order to inform a long term and comprehensive life cycle plan looking for certain areas of opportunities to reduce greenhouse gas emissions during the 30 years contract period and beyond. Finally, it is also encouraged further studies in regard to air pollutants, possibly adopting the California Ambient Air QUALITY STANDARDS to document in a more rigorous way and measure precise reductions of different air pollutants (Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone, Particle pollution, Sulfur Dioxide) as compared to standards used.

In terms of resilience APM Terminals Callao considered a natural hazards emergency plan that covers certain climate threat issues. Despite the aforementioned design strategies, the team did not consider a specific Climate Impact Assessment and Adaptation beyond the 30 years concession agreement. In other words, even so there is a risk management and action plan in case of natural hazards emergency, its impact is still limited from potential long-term traps, vulnerabilities and risk due to long term changes such as climate change. Consequently, there is a great opportunity for actual Plan to evolve to Long-Term comprehensive climate impact assessment and Adaptability plan. This should include important design variables and associated assumptions used in the design of the project comparing those assumptions to the potential impacts of climate change over the design life of the project.

In conclusion, considering a more systemic approach could be an opportunity to achieve higher levels of sustainability; in addition, the application of new methodologies and technologies could lead to a collaborative process to optimize the overall performance of the port beyond its physical limits.

Considering the 30-year concession contract and the future expansion of the port’s lifespan beyond the concession period, further specification is necessary in relation to the funding allocation for monitoring and maintenance in future stages of the project considering also the implementation of projects towards mitigation plan of incremental traffic on land and in oceanfront. Furthermore, flexibility to enable reconfiguration and refurbishment in the project should be included; this will enhance resilience in case of extreme events and the durability of the new infrastructure. It is also recommended to include a feasibility study to identify the key areas where increasing investment in extending useful life of the port offers a reasonable payback.

A systematic assessment of the laws, regulations, policies and standards applicable to the port is provided. Utilizing this assessment, the Environmental Management Plan integrates the elements necessary for operational control to ensure compliance with legal requirements and other commitments for the project sustainability goals. Moreover, formalizing the sharing of risks and rewards in the contracts between the project owner and the project team is an important step to consider in advancing sustainable performance. Finally, the input received from the community should be documented and integrated into the decision-making process of the port construction and operations.

This report evaluates the sustainability performance of the Modernization project of the Multipurpose North Terminal in the Port of Callao project according to the Envision™ Rating System. The report identifies areas in which the project scored highly, as well as low-scoring areas that represent opportunities for which the project team can learn and improve on in future projects, as they strive to achieve sustainable project design and construction methodologies.

APPENDIX:

APPENDIX A: PROJECT PICTURES AND DRAWINGS

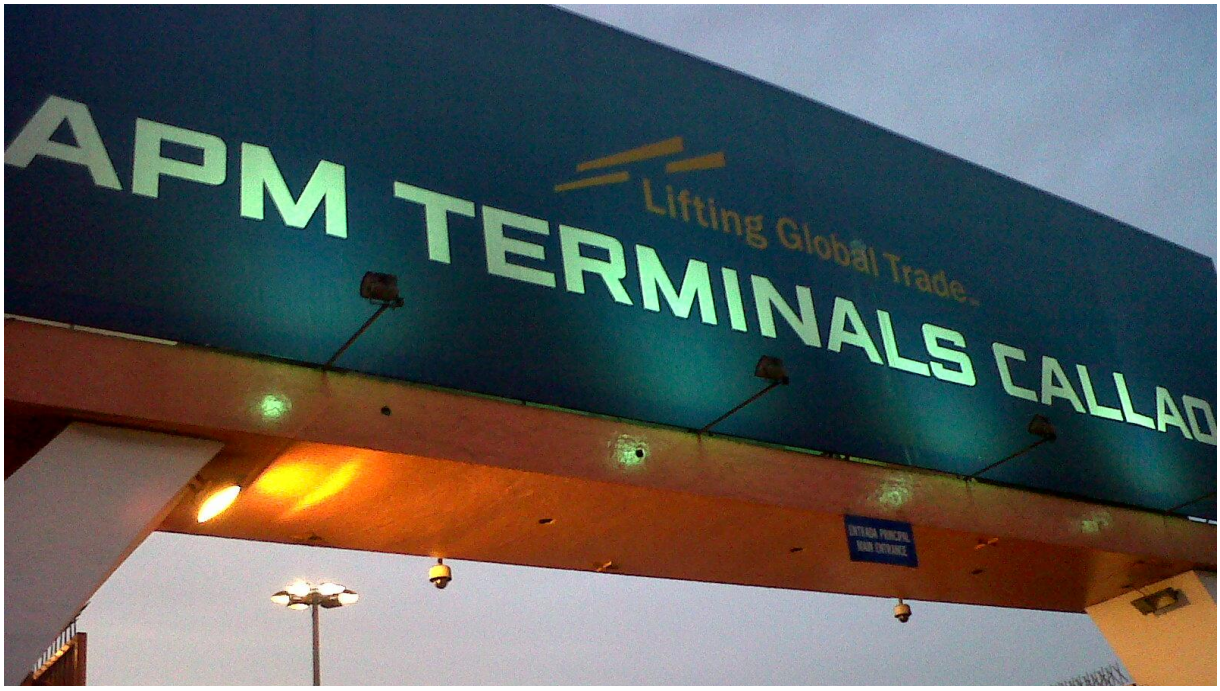

Figure 2 & 3: General pictures of the project
Sources: APM Terminals Callao, **Bruno Giuffra, Empresario / El Comercio, Somos N°1346**

Figure 4: Location map.
Sources: Municipalidad Provincial el Callao, accesed Dec 7 , 2014, link www.municallao.gob.pe/muniCallao/

Figure 5 & 6: General view of the project under construction
Sources: APM Terminals Callao

Figure 7 & 8: Identifying levels of water and contamination
Sources: APM Terminals Callao

Figure 9 & 10: Identifying levels of water and contamination
Sources: APM Terminals Callao

Figure 11: New Generation Cargo Equipment
Sources: APM Terminals Callao

Figure 12: Land Remediation Process
Sources: APM Terminals Callao

Figure 13: Land Remediation Process
Sources: APM Terminals Callao

Figure 14: Land Remediation under process
Sources:APM Terminals Callao

Figure 15: Old Tank preservation
Sources: APM Terminals Callao

Figure 16: Foundations under development
Sources: APM Terminals Callao

Figure 17: Land remediation process
Sources: APM Terminals Callao

Figure 18: Perforation process
Sources: APM Terminals Callao

Figure 19: Perforation process
Sources: APM Terminals Callao

APPENDIX B: ENVISION POINTS TABLE

CREDIT SCORING

					IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve community quality of life		2	5	10	**20**	**25**
2			QL1.2 Stimulate sustainable growth and development		1	2	5	13	**16**
3			QL1.3 Develop local skills and capabilities		1	2	5	12	**15**
4		COMMUNITY	QL2.1 Enhance public health and safety		2			**16**	
5			QL2.2 Minimize noise and vibration		1			8	**11**
6			QL2.3 Minimize light pollution		1	2	4	8	**11**
7			QL2.4 Improve community mobility and access		1	4	7	**14**	
8			QL2.5 Encourage alternative modes of transportation		1	3	6	12	**15**
9			QL2.6 Improve site accessibility, safety and wayfinding			3	6	12	**15**
10		WELLBEING	QL3.1 Preserve historic and cultural resources		1		7	**13**	**16**
11			QL3.2 Preserve views and local character		1	3	6	11	**14**
12			QL3.3 Enhance public space		1	3	6	11	**13**
				Maximum points possible:				**181**	
13	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment		2	4	9	**17**	
14			LD1.2 Establish a sustainability management system		1	4	7	**14**	
15			LD1.3 Foster collaboration and teamwork		1	4	8	**15**	
16			LD1.4 Provide for stakeholder involvement		1	5	9	**14**	
17		MANAGEMENT	LD2.1 Pursue by-product synergy opportunities		1	3	6	12	**15**
18			LD2.2 Improve infrastructure integration		1	3	7	13	**16**
19		PLANNING	LD3.1 Plan for long-term monitoring and maintenance		1	3		**10**	
20			LD3.2 Address conflicting regulations and policies		1	2	4	**8**	
21			LD3.3 Extend useful life		1	3	6	**12**	
				Maximum points possible:				**121**	
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy		2	6	12	**18**	
23			RA1.2 Support sustainable procurement practices		2	3	6	**9**	
24			RA1.3 Use recycled materials		2	5	11	**14**	
25			RA1.4 Use regional materials		3	6	9	**10**	
26			RA1.5 Divert waste from landfills		3	6	8	**11**	
27			RA1.6 Reduce excavated materials taken off site		2	4	5	**6**	
28			RA1.7 Provide for deconstruction and recycling		1	4	8	**12**	
29		ENERGY	RA2.1 Reduce energy consumption		3	7	12	**18**	
30			RA2.2 Use renewable energy		4	6	13	16	**20**
31			RA2.3 Commission and monitor energy systems			3		**11**	
32		WATER	RA3.1 Protect fresh water availability		2	4	9	17	**21**
33			RA3.2 Reduce potable water consumption		4	9	13	17	**21**
34			RA3.3 Monitor water systems		1	3	6	**11**	
				Maximum points possible:				**182**	
35	NATURAL WORLD	SITING	NW1.1 Preserve prime habitat				9	14	**18**
36			NW1.2 Protect wetlands and surface water		1	4	9	14	**18**
37			NW1.3 Preserve prime farmland				6	12	**15**
38			NW1.4 Avoid adverse geology		1	2	3	**5**	
39			NW1.5 Preserve floodplain functions		2	5	8	**14**	
40			NW1.6 Avoid unsuitable development on steep slopes		1		4	**6**	
41			NW1.7 Preserve greenfields		3	6	10	15	**23**
42		LAND & WATER	NW2.1 Manage stormwater			4	9	17	**21**
43			NW2.2 Reduce pesticide and fertilizer impacts		1	2	5	**9**	
44			NW2.3 Prevent surface and groundwater contamination		1	4	9	14	**18**
45		BIODIVERSITY	NW3.1 Preserve species biodiversity		2			13	**16**
46			NW3.2 Control invasive species				5	9	**11**
47			NW3.3 Restore disturbed soils					8	**10**
48			NW3.4 Maintain wetland and surface water functions		3	6	9	15	**19**
				Maximum points possible:				**203**	
49	CLIMATE & RISK	EMISSIONS	CR1.1 Reduce greenhouse gas emissions		4	7	13	18	**25**
50			CR1.2 Reduce air pollutant emissions		2	6		12	**15**
51		RESILIENCE	CR2.1 Assess climate threat					**15**	
52			CR2.2 Avoid traps and vulnerabilities		2	6	12	16	**20**
53			CR2.3 Prepare for long-term adaptability					16	**20**
54			CR2.4 Prepare for short-term hazards		3		10	17	**21**
55			CR2.5 Manage heat islands effects		1	2	4	**6**	
				Maximum points possible:				**116**	
								803	

**The five innovation credits are bonus points and not included in total point tallies*

APPENDIX C: GRAPHS

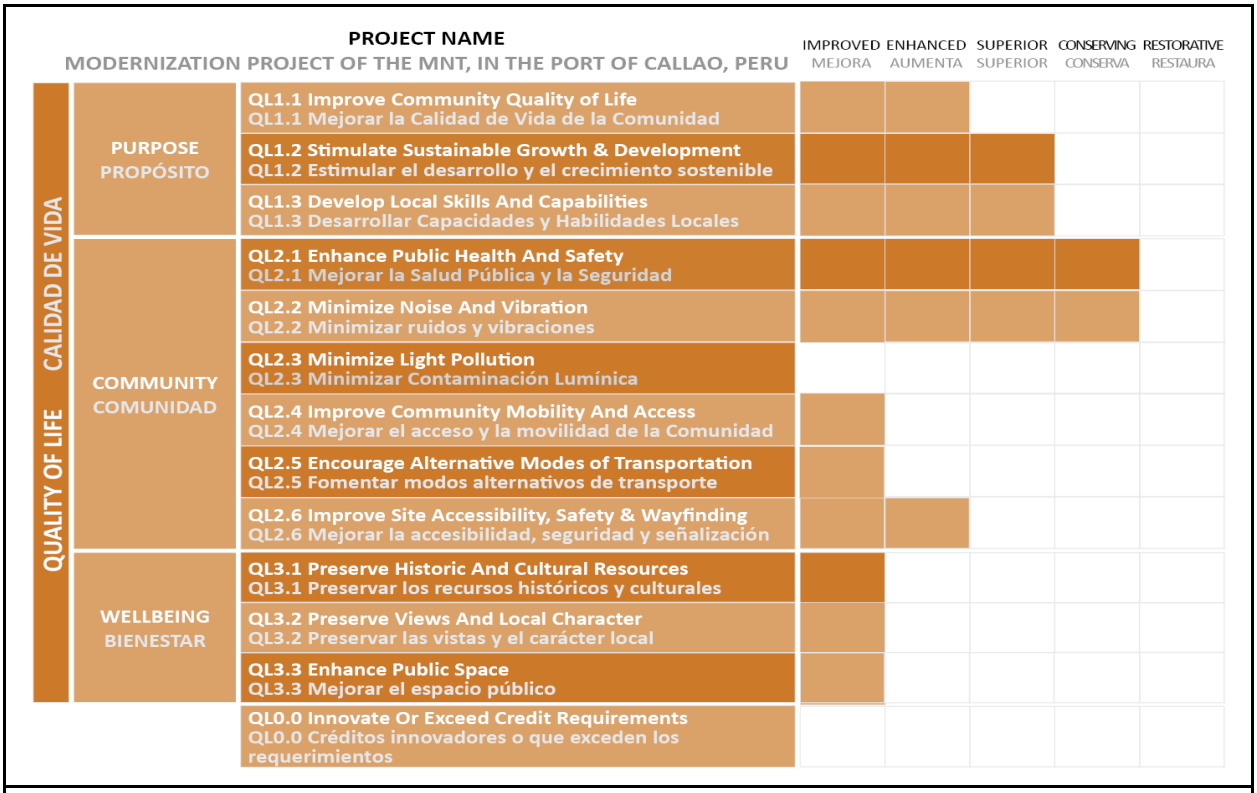

Figure 20: Quality of Life category_ Summary of results

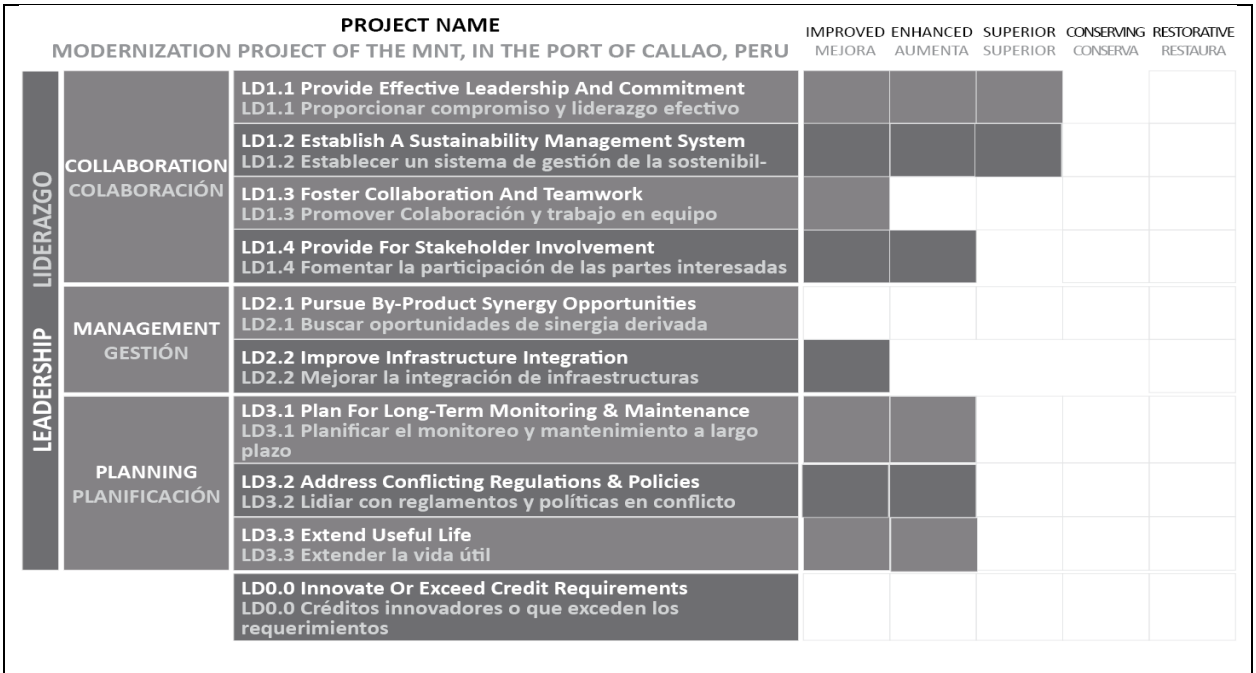

Figure 21: Leadership category_ Summary of results

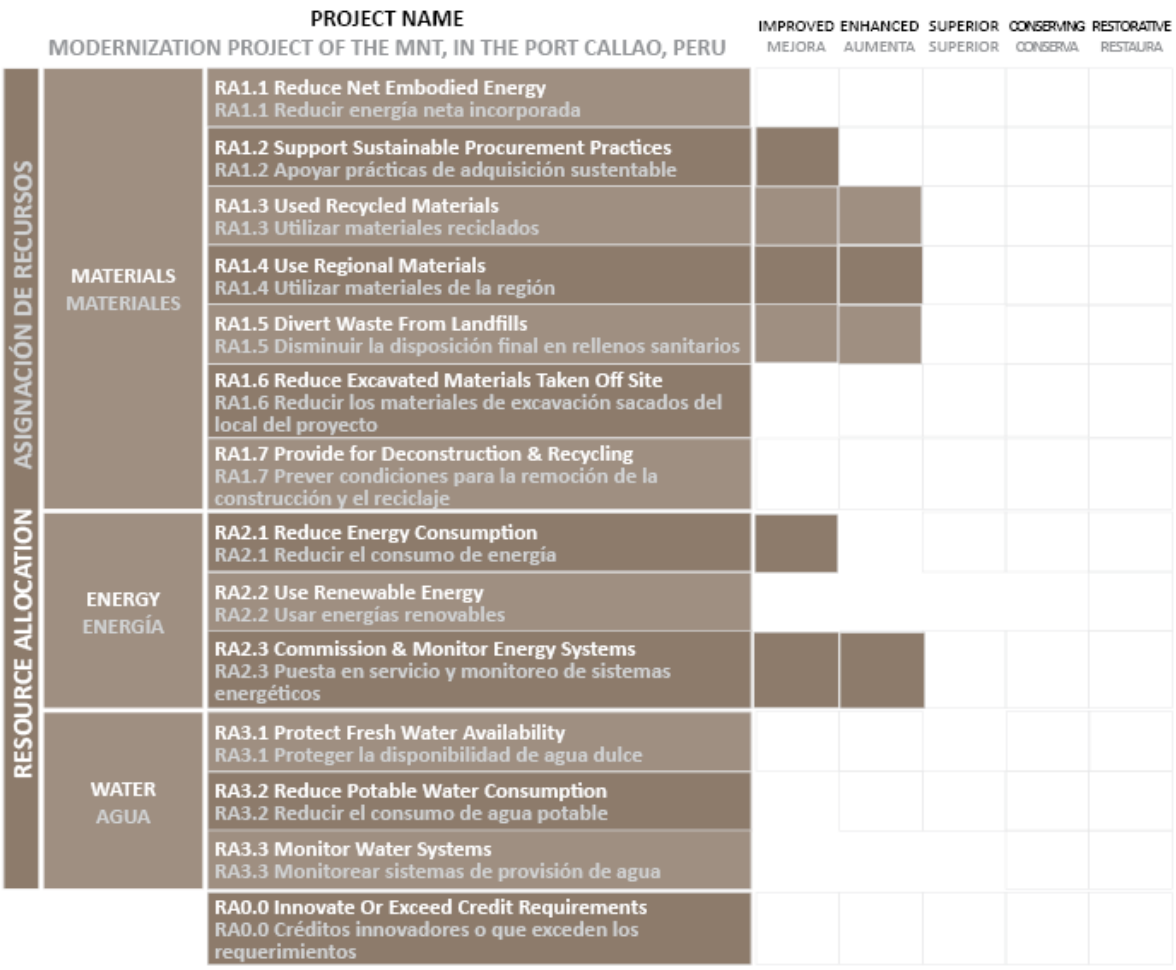

Figure 22:Resource Allocation category_ Summary of results

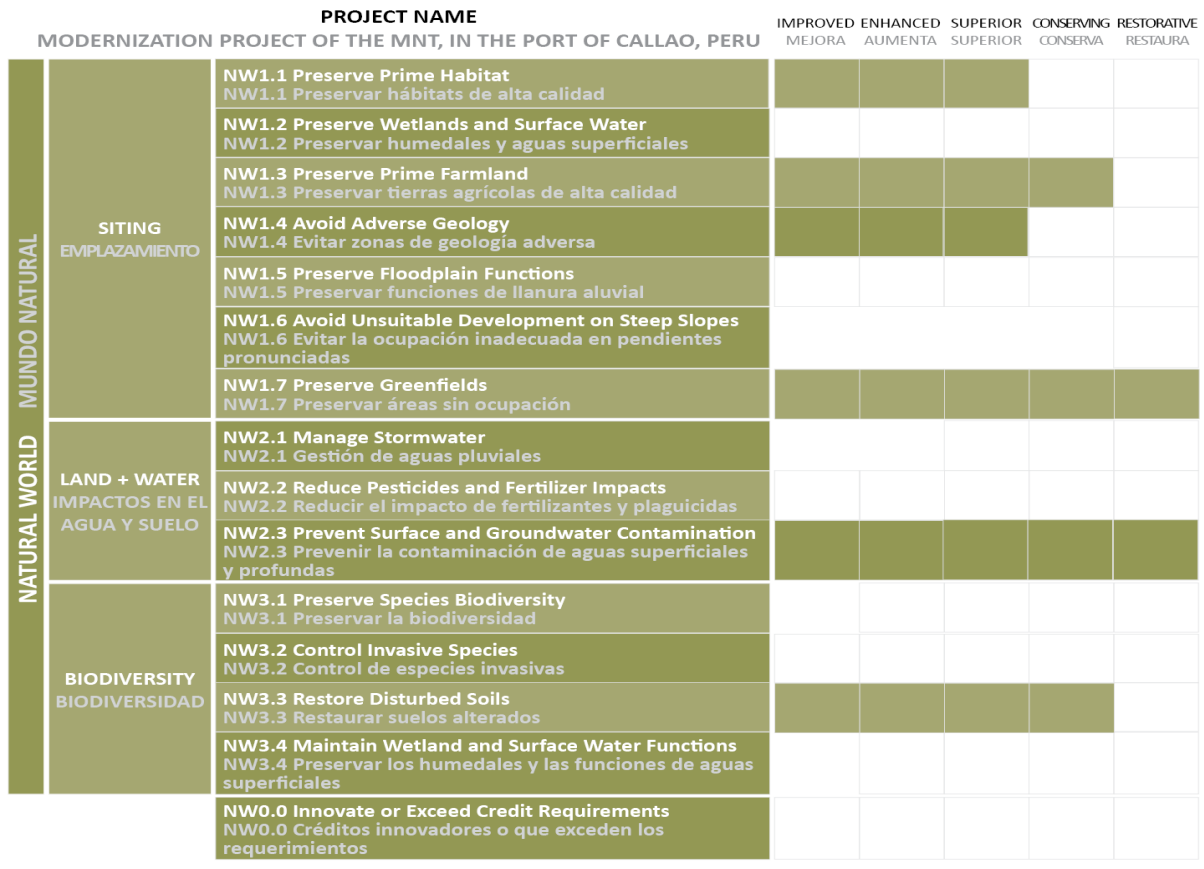

Figure 23: Natural World category_ Summary of results

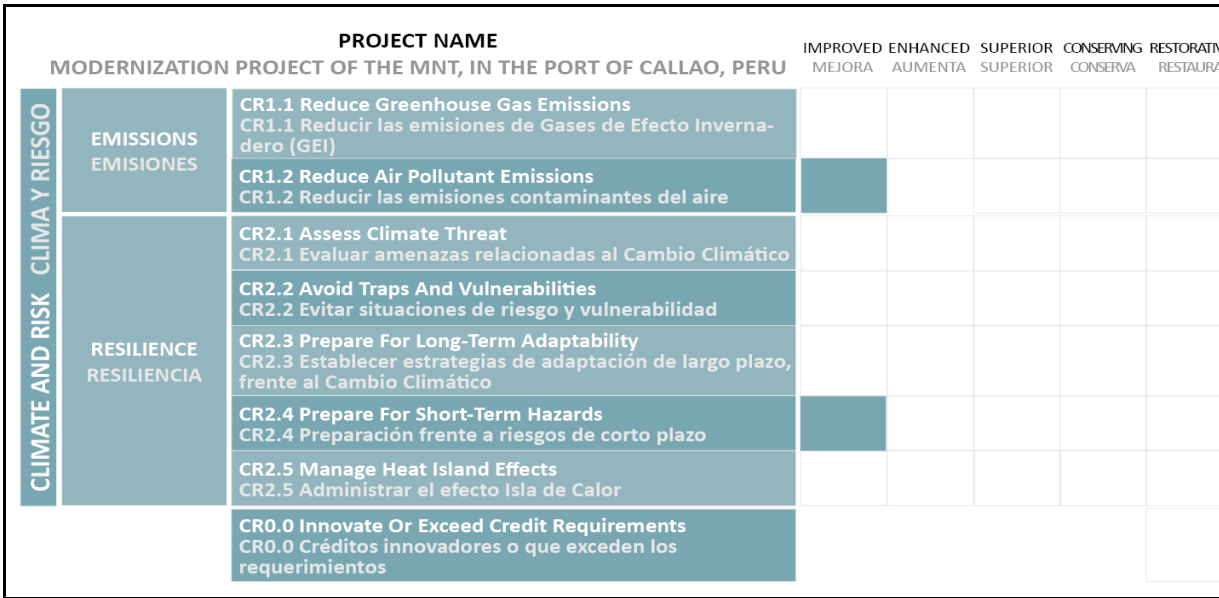

Figure 24: Climate & Risk category_ Summary of results

Figure 25: People & Leadership award Summary of results

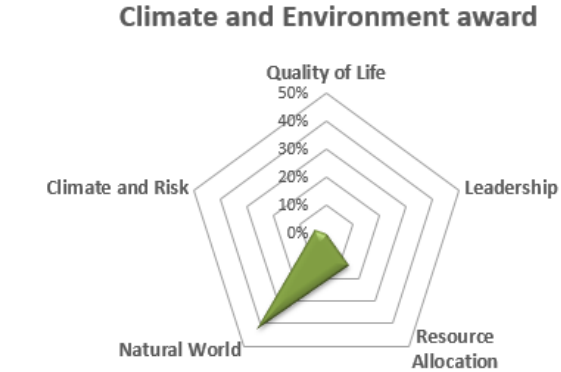

Figure 26: Climate & Environment award Summary of results

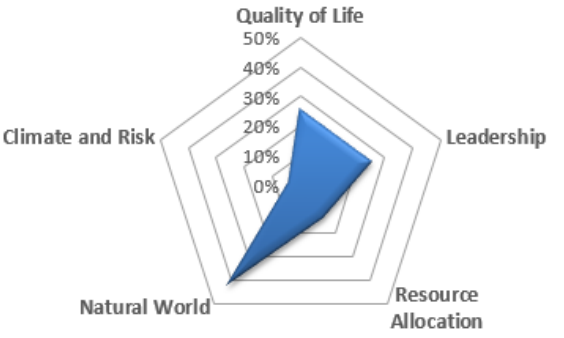

Figure 27: Infrastructure 360 award Summary of results

			MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT), LIMA, PERU	PT.	Performance
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	5	Enhanced
2			QL1.2 Stimulate Sustainable Growth & Development	5	Superior
3			QL1.3 Develop Local Skills And Capabilities	5	Superior
4		COMMUNITY	QL2.1 Enhance Public Health And Safety	16	Conserving
5			QL2.2 Minimize Noise And Vibration	8	Conserving
6			QL2.3 Minimize Light Pollution	0	No score
7			QL2.4 Improve Community Mobility And Access	1	Improved
8			QL2.5 Encourage Alternative Modes of Transportation	1	Improved
9			QL2.6 Improve Site Accessibility, Safety & Wayfinding	3	Enhanced
10		WELLBEING	QL3.1 Preserve Historic And Cultural Resources	1	Improved
11			QL3.2 Preserve Views And Local Character	1	Improved
12			QL3.3 Enhance Public Space	1	Improved
			QL0.0 Innovate Or Exceed Credit Requirements	0	0
			QL	47	

			MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT), LIMA, PERU	PT.	Performance
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership And Commitment	9	Superior
14			LD1.2 Establish A Sustainability Management System	7	Superior
15			LD1.3 Foster Collaboration And Teamwork	1	Improved
16			LD1.4 Provide For Stakeholder Involvement	5	Enhanced
17		MNGMT.	LD2.1 Pursue By-Product Synergy Opportunities	0	No Score
18			LD2.2 Improve Infrastructure Integration	1	Improved
19		PLANNING	LD3.1 Plan For Long-Term Monitoring & Maintenance	3	Enhanced
20			LD3.2 Address Conflicting Regulations & Policies	2	Enhanced
21			LD3.3 Extend Useful Life	3	Enhanced
			LD0.0 Innovate Or Exceed Credit Requirements	0	N/A
			LD	31	

			MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT), LIMA, PERU	PT.	Performance
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	No Score
23			RA1.2 Support Sustainable Procurement Practices	2	Improved
24			RA1.3 Used Recycled Materials	5	Enhanced
25			RA1.4 Use Regional Materials	6	Enhanced
26			RA1.5 Divert Waste From Landfills	6	Enhanced
27			RA1.6 Reduce Excavated Materials Taken Off Site	0	No Score
28			RA1.7 Provide for Deconstruction & Recycling	0	No Score
29		ENERGY	RA2.1 Reduce Energy Consumption	3	Improved
30			RA2.2 Use Renewable Energy	0	No Score
31			RA2.3 Commission & Monitor Energy Systems	3	Enhanced
32		WATER	RA3.1 Protect Fresh Water Availability	0	No Score
33			RA3.2 Reduce Potable Water Consumption	0	No Score
34			RA3.3 Monitor Water Systems	0	No Score
			RA0.0 Innovate Or Exceed Credit Requirements	0	N/A
			RA	**25**	

			MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT), LIMA, PERU	PT.	Performance
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	9	Superior
36			NW1.2 Preserve Wetlands and Surface Water	0	No Score
37			NW1.3 Preserve Prime Farmland	12	Conserving
38			NW1.4 Avoid Adverse Geology	3	Superior
39			NW1.5 Preserve Floodplain Functions	0	No Score
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	0	No Score
41			NW1.7 Preserve Greenfields	23	Restorative
42		L & W	NW2.1 Manage Stormwater	0	No Score
43			NW2.2 Reduce Pesticides and Fertilizer Impacts	0	No Score
44			NW2.3 Prevent Surface and Groundwater Contamination	18	Restorative
45		BIODIVERSITY	NW3.1 Preserve Species Biodiversity	0	No Score
46			NW3.2 Control Invasive Species	0	No Score
47			NW3.3 Restore Disturbed Soils	8	Conserving
48			NW3.4 Maintain Wetland and Surface Water Functions	0	No Score
			NW0.0 Innovate or Exceed Credit Requirements	0	N/A
			NW	73	

			MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT), LIMA, PERU	PT.	Performance
49	CLIMATE	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	0	No Score
50			CR1.2 Reduce Air Pollutant Emissions	2	Improved
51		RESILENCE	CR2.1 Assess Climate Threat	0	No Score
52			CR2.2 Avoid Traps And Vulnerabilities	0	No Score
53			CR2.3 Prepare For Long-Term Adaptability	0	No Score
54			CR2.4 Prepare For Short-Term Hazards	3	Improved
55			CR2.5 Manage Heat Island Effects	0	No Score
			CR0.0 Innovate Or Exceed Credit Requirements	0	N/A
			CR	5	

Total points	**181**	**0**

APPENDIX D: CREDIT DETAIL

MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT): CREDIT SPREADSHEET WITH DETAILS		
CATEGORY I, PEOPLE AND LEADERSHIP		
SUB CATEGORY: QUALITY OF LIFE		
	Score	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**
QL1.1 Improve Community Quality of Life	**5**	**Enhanced**
		The team has identified in detail the direct and indirect area of influence of the project, mapping all relevant interest groups, for better compliance to the Environmental Management Plan (EMA) from the point of view of social relations and community needs. The most influential organizations are neighborhood associations, who pointed out that security and employment are the biggest needs of the residential communities surrounding the project area. Clashes between armed groups, drug dealers, rapes and general violence in the area are some of the security concerns among the neighbors. Notwithstanding the efforts by APM to include the communities and address their needs, most people interviewed in the indirect area of influence are not aware of the company's activities or the type of work they do, nor its relationship with the government. The uncertainty among the population about the role of the company creates misperceptions about the future and whether the port's expansion could displace some of the most vulnerable populations in the surrounding area. In addition, the population attributes the increased movement of heavy vehicles and negative traffic impacts to port activity. Heavier traffic has worsened commuting times, acoustic and environmental pollution, and accidents.
		Source: *Golder Associates. Mapeo de Grupos de Interés APM Terminals. Agosto de 2014* *APM Terminals Callao. EAP: Diagnóstico del Medio Socioeconómico y Sociocultural.* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-18 Asuntos Sociales. Enero 2013.* *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.Capítulo 5: Plan de participación ciudadana.*
		RECOMMENDATIONS
		The specific programs implemented by APM seeking to improve community quality of life should be acknowledged; however, the reconciliation between the industrial use in the port area and the residential use of land in surrounding communities is still a matter to be resolved. Many of the negative impacts of the project, such as heavy traffic and noise, in the surrounding area of influence could be addressed by better planning measures and infrastructure updates. In terms of environmental pollution, there is a serious concern in the community about pollution from lead in the area. Even if the Port of Callao is not indicated as directly responsible for this contamination, restoration and improvement of this condition will improve the quality of life of the surrounding communities. Furthermore, the overall communication strategy and relationship between APM and its stakeholders could be improved in order to achieve meaningful community engagement and a systematically collaborative model of work.
QL1.2 Stimulate Sustainable Growth & Development	**5**	**Superior**
		In two years, the modernization of the Port of Callao not only created new jobs as a result of the delivered infrastructure but it also expanded the socio-economic opportunities of the community by implementing social programs that include the support for sustainable local development and artisanal fisheries. These

		programs were defined in response to the needs raised by the community and local organizations. Additionally, a nutrition program was implemented in alliance with the Municipality of Callao to benefit more than 250 children in the area. This program aims to improve the children's nutrition, increase their attention level during class, and to ease the economic concerns of the beneficiaries of the program. Furthermore, APM conducted an environmental education program in the area schools, aiming to raise awareness and provide information to the local population on environmental issues and sustainable management of natural resources. To promote local entrepreneurship, APM and local leaders created a bakery, including equipment and training, to support the economic development of the area and provide new sources of employment to youth. In addition, to support small-scale fisheries in the project's area, APM and the local fishermen's associations implemented a plan to update their facilities and provide continuous training to improve their skills.
		Source: *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-18 Asuntos Sociales. Enero 2013.* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-11. Educación Ambiental. Enero 2013.* *AMP Terminals Callao. Reporte de Sostenibilidad. July 2011 - June 2013* *AMP Terminals Callao & ECOTEC. Informe Socio Ambiental. 5.8.4 Subprograma de Apoyo al Desarrollo Sostenible Local. Pg. 70* *AMP Terminals Callao & ECOTEC. Informe Socio Ambiental. 5.8.5 Subprograma de Apoyo al Desarrollo Pesquero Artesanal. Pg. 71*
		RECOMMENDATIONS Clearly, these social programs contribute to the capabilities and productivity of surrounding communities, but the impact of those programs is not measured in the information provided. Therefore, it is not possible to assess their success in the overall social context. For example, the case of the local bakery project implemented in Puerto Nuevo could be a replicable model to contribute to the necessary shift from a project-centered job creation model to an economic development-centered model, opening new opportunities and increasing the range of choices for younger generations.
QL1.3 Develop Local Skills and Capabilities	**5**	**Superior**
		APM Terminals Callao promotes local employment and work opportunities to ensure maximum resident involvement in the area of influence of the project, according to the port labor needs. Employment opportunities are published both internally and in local media. APM Terminals has hired a large number of local workers, who are trained at the 'Training Center', for which the company developed several courses in how to operate the terminal equipment. In this way, new personnel are trained and they have the opportunity to start technical studies. Employees can select among different technical courses in relation to construction, installations, and port operations. Additionally, a program in environmental management is offered for the company's workers, to create awareness among the staff of the importance of complying with the plans, procedures, standards, instructions and requirements of the Environmental Management System, as well as the consequences of non-compliance. The vast majority of the port suppliers are local, according to the list of providers. The company preferably tries to work with local suppliers, which boosts the local economy. To achieve this, some of the logistical requirements are eased, allowing shorter payment periods or direct trade of marine products in open markets. The largest supplier is the FCC / JJC contractor, which is 50% Peruvian.
		Source: *AMP Terminals Callao & ECOTEC. Informe Socio Ambiental. 5.8.2Subprogramaa de Contratación de Mano de Obra Local. July 2014. Pg. 69.* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-12 Capacitación y Sensibilización. Enero 2013.* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-18 Asuntos Sociales. Enero 2013*

		Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao, Estrategias de relacionamiento comunitario con stakeholders, Marzo 2014.
		RECOMMENDATIONS Despite the efforts done to include women in the port activity, there is still a huge gap between male and female workers. In the case of APM employees, only 9.37% are female, and for port workers, only 3.91% (see chart below). Considering the historic predominance of male workers in port labor, strategies to employ more women in the following years should be a matter of consideration in the overall project employment plan. Besides the employees and workers directly involved in the port activity, the project must consider making a meaningful contribution to long-term competitiveness of the surrounding community. Therefore, the activities and training offered at the Training Center could be opened to others or replicated in local schools to provide new technical skills for the local youth.
QL2.1 Enhance Public Health And Safety	**16**	**Conserving**
		Since July 2011, APM Terminals Callao has placed special emphasis on implementing high safety standards to ensure that staff can perform their work without suffering accidents. To that end, the inclusion of new technology, such as a personalized TAG system for all workers in the port area (remote sensors that activate when in proximity of machines) and new electric cranes offer better standards of security for workers. Additionally, the security program integrates new methodologies and campaigns for safety and awareness in order to achieve their goal of zero accidents or fatalities. This safety benchmark established by APM goes beyond the Peruvian regulatory requirements and contributes to the overall health of the workers by avoiding possible accidents. In addition to the prevention measures, APM provides health support to all employees, including an annual medical examination and family health insurance. There is also a full-time doctor on staff to ensure that all health needs are met. Despite the efforts of APM to look after the health of their employees, there are still outstanding issues, such as the lead pollution related to port operations. Even if APM is not directly responsible, given that the main cause of the pollution is train and truck transportation and the lead storage of the Impala Company, this is a matter of public health that all companies working in the area should collaboratively address for the benefit of the community.
		Source: *Consorcio Constructor FCC-JJC. Manual de Procedimientos de Protección (MAPROP). April, 2013* *Consorcio Constructor FCC-JJC. Evaluación de Protección de la Instalación (EPI). April, 2013* *Consorcio Constructor FCC-JJC. Plan de Protección de la Instalación (PPI). April, 2013* *Consorcio Constructor FCC-JJC. Plan de Seguridad y Salud en el Trabajo (FJ-HSP).*
		RECOMMENDATIONS The project integrated technologies and methodologies to ensure the health and safety of all involved in its phases of construction and operation, going beyond regulatory requirements. Considering this level of achievement, the next step will be to collaborate on the problems that the surrounding communities expressed in relation to these issues. In terms of safety, APM partnered with the Police to install response stations in the most dangerous areas. But in terms of health, the population is afraid of lead pollution, which is mobilized through the streets of the residential neighborhoods and deposit close to the port area. According to the Health Center of Puerto Nuevo, ratified by the Ministry of Health, the lead contamination level exceeds the limits for children, especially in Puerto Nuevo and Corongo. Even if APM is not directly responsible for the lead pollution, this matter should not be ignored and collaborative solutions should be found among the companies in the area to achieve a solution.
QL2.2 Minimize	**8**	**Conserving**

Noise And Vibration		APM Terminals Callao decided to purchase equipment with the latest technology to reduce noise and vibration in installations or machinery on the site (silencers, anti-noise barriers, shock absorbers). With these considerations, the project is within the acceptable levels of noise, during day and night hours, established by Peruvian noise norms (Decreto Supremo N° 085-2003-PCM). The levels of vibration of the project are lower than the ones allowed by the norm (ISO 2631-1 Vibration). In addition, a monthly monitoring program is conducted to verify compliance with the national standards. The major problem is not necessarily the direct noise in the port area, but the heavy traffic activity related with it, which affects surrounding communities by causing noise and air pollution. The risk of accidents is higher among pedestrians in the area and there is a general sense of insecurity in the busiest streets.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.1.3 Calidad Ambiental. 4.1.3.2 Niveles de Ruido y Medición de Vibraciones* *SGS Environmental Services. SGS del Perú S.A.C. Informe de Monitoreo de Calidad de Aire, Ruido Ambiental y Vibraciones (MO 330631). August 2014.*
		RECOMMENDATIONS Even though the noise and vibration levels of the project itself achieved acceptable levels, a comprehensive proposal for noise reduction in the surrounding communities could be implemented to improve livability in the neighborhoods. The aim should be to reduce the negative impacts of the project, creating quieter communities, resulting in the expansion of feasible uses of properties adjacent to the port and higher property values. This could contribute to a reduction in the deterioration and violence present in the neighborhoods adjacent to the port activity.
QL2.3 Minimize Light Pollution	**0**	**No Score**
		As specified by the project team, APM Terminals Callao hired the company Pacific EPS to produce a Lighting Analysis of the port facilities, because the lighting levels did not meet international standards. This analysis was the baseline for improving lighting in the port facilities, considering the new administrative building and the container yard. There is no documentation for this information.
		Source: *N/A*
		RECOMMENDATIONS Considering that the lighting assessment of the project was already conducted and appropriate lighting zones were established, the next step to improve sustainable standards will be to reduce light energy requirements, using design strategies for energy efficiency. In addition, lighting can also be designed to reduce light spillage and excessive glare.
QL2.4 Improve Community Mobility And Access	**1**	**Improved**
		The cities of Lima and Callao are connected by several major roads, among them Av. Argentina, Colonial, and Néstor Gambetta. Furthermore, there is the Central Railway Station, which mainly transports minerals from central Peru. Trucks mostly travel the roads, transporting minerals and economic goods to the docks and ports, but commuters also use these same roads, causing major traffic and congestion. Therefore, the impact of the project in relation to community access and mobility is still a matter to improve. Even though upgrades to existing roads and a new access point were taken into consideration to facilitate heavy traffic in the port area, aspects such as community walkability and livability were negatively affected. The participatory approach of the EMP denotes the concerns of the local community in relation to the consequences of increased traffic, such as air pollution and insecurity. Another aspect of concern is the

		lead pollution transported in open trucks to the port area, especially for residents living near the main routes of the trucks and warehouses.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.3 Diagnóstico del Medio Socioeconómico y Sociocultural. 4.3.2.1.8 Transporte y Comunicaciones.*
		RECOMMENDATIONS APM is trying to coordinate with local authorities and other companies in the area to elevate the road for port-related traffic, with the objective of separating that type of transportation from the residents of the affected neighborhoods. Nevertheless, it is recommended that in the short term, a comprehensive mobility plan in coordination with the affected communities is considered, in order to address pressing matters regarding safety and pollution. In the long term, strategic improvements including transportation efficiency, better access to public transit, and the use of non-motorized transportation will contribute to improved community mobility and accessibility, reducing the negative impacts of the project in the surrounding neighborhoods.
QL2.5 Encourage Alternative Modes of Transportation	**1**	**Improved**
		Given the high levels of violence associated with the area surrounding the port, APM recommends avoiding walking during night time to prevent any incidents. Considering the danger present in the zone, APM Terminals Callao hired a special transportation system for all employees in July 2011 and has worked with the police officers in the area, implementing two police emergency stations in the vicinity of the port. But even with these actions, high levels of insecurity remain, and this fact deters port workers and the surrounding population from using alternative modes of transportation like walking or biking. In addition, connections to public transportation remain limited because the access point to the port doesn't have direct access to buses. However, it should be taken into consideration that the improvement project considers changing the access to a major road to provide better accessibility and to encourage the use of public transportation.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.3 Diagnóstico del Medio Socioeconómico y Sociocultural. 4.3.2.1.8 Transporte y Comunicaciones*
		RECOMMENDATIONS APM should consider integrating strategies to promote alternative transportation, such as the use of public transit and non-motorized transit by workers and the population of the surrounding area. But in order to implement those strategies, the level of violence and insecurity associated with the area must be dealt with. Safety will encourage walkability and will improve overall life quality for surrounding communities. Nevertheless, APM could start to incorporate networks for pedestrian and bicycle paths in coordination with the municipality and ensure the inclusion of the community in the process.
QL2.6 Improve Site Accessibility, Safety & Wayfinding	**3**	**Enhanced**
		The design project implemented an effective plan to achieve high standards for the workers' daily security and for prevention and response in case of emergency situations. The implemented design plan requires providing employees with working conditions that are free of known dangers. The plan also provides information, training and assistance to workers and employers. In addition clear signage and wayfinding are considered as part of the strategies integrated into the port

		modernization project. Other important issue is to measure emergency response. Design includes access and egress of emergency personnel, users, and occupants. It should be noted that the design strategies are complemented by protocols and training programs to ensure the timely and effective reaction of all employees in the port area.
		Source: *Consorcio Constructor FCC-JJC. Manual de Procedimientos de Protección (MAPROP). April, 2013* *Consorcio Constructor FCC-JJC. Evaluación de Protección de la Instalación (EPI). April, 2013* *Consorcio Constructor FCC-JJC. Plan de Protección de la Instalación (PPI). April, 2013* *Consorcio Constructor FCC-JJC. Plan de Seguridad y Salud en el Trabajo (FJ-HSP). Plan de Preparación y Respuesta ante Emergencias.* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-15 Señalización Ambiental. Enero 2013.*
		RECOMMENDATIONS The high level of security standards and the design strategies utilized in the project to achieve them should be expanded in the future to the adjacent neighborhoods. Additionally, providing effective accessibility and protection, for example, by improving high visibility pedestrian crossings could reduce current levels of violence and guarantee better security for the population.
QL3.1 Preserve Historic and Cultural Resources	**1**	**Improved**
		The sector of the province of Callao where the project is located has no archaeological findings. The knowledge about existence of old pre-Hispanic populations in Callao area is fragmented and comes mainly from historical contribution; despite the limited available information it is known that a set of small chiefdoms settled on the coast. Therefore, an archaeological assessment was conducted at the project site, which concluded that there is no archaeological evidence in the study area. On the project's site, one water tank structure was declared as cultural heritage. To protect the water tank from the port activity, it was removed, in keeping with Peruvian heritage norms for that kind of procedure and given to the government for relocation.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.3 Diagnóstico del Medio Socioeconómico y Sociocultural. 4.3.2.1.6 Infraestructura Social* *Consorcio Muelle Norte Callao. Plan de Manejo Ambiental. FJE-17. Aspectos Arqueológicos. Enero 2013.*
		RECOMMENDATIONS The project presents evidence about the archaeological assessment conducted to identify any elements that should be preserved from pre-Hispanic settlements, but what is not addressed is a comprehensive analysis of the port industrial facilities constructed since 1828 and after, considering how those facilities are integrated or not to the project of modernization of the port. At present, no heritage preservation norms are applied to industrial facilities, but given the large amount of information available and the particular history of the port, APM should consider these types of constructions as part of the city's heritage, and therefore, studies for historical and cultural preservation should be conducted to evaluate future actions on the site.
QL3.2 Preserve Views and Local Character	**1**	**Improved**
		The historic growth of the population surrounding the port area and the continuous process of industrialization has completely altered the natural landscape of the area. The industrial landscape dominates the area where the modernization of the port is located; therefore the project is not concerned with the preservation of the natural landscape because it is long gone. Notwithstanding, several base studies were performed to establish the basic conditions of the land, sea, environment, and

		socio economic areas in order to consider them in the design of the project and to monitor possible changes when the operations began. Regarding the design of the new administrative building and other construction related to the port modernization, they correspond to the industrial landscape predominant in the area, creating a coherent aesthetic by merging the new buildings with the old ones.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capitulo 3: Área de Influencia* *APM Terminals Callao. EAP: Diagnóstico del Medio Socioeconómico y Sociocultural.*
		RECOMMENDATIONS The negative impacts generated by industrial activity close to residential neighborhoods could be mitigated by identifying compatible land uses and setting policies for new development in the areas adjacent to the port. When implementing any changes or solutions, it will be key to consider the integration of community views in order to better understand the local character and find ways to resolve the existing tensions between the project and its context.
QL3.3 Enhance Public Space	**1**	**Improved**
		In general, APM Terminals Callao has worked with communities to address their needs and provide programs to enhance the quality of life for all. Despite these efforts, the project does not consider the creation of new public space as part of their social management plan; however, the project has no adverse effects on existing public space.
		Source: *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.3 Diagnóstico del Medio Socioeconómico y Sociocultural. 4.3.2.1.6 Infraestructura Social*
		RECOMMENDATIONS Public spaces play an important role in community activity and social cohesion, therefore, improvements in existing public spaces or the creation of new ones should be considered as part of the social programs that APM is implementing. These kinds of interventions could bring important benefits to the overall community and complement the programs implemented in other areas like Zeducation, health, and safety.
QL0.0 Innovate Or Exceed Credit Requirements		
	47	
SUB CATEGORY:LEADERSHIP		
	Score	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**
LD1.1 Provide Effective Leadership And Commitment	**9**	**Superior**
		The Annual Sustainability Report demonstrates the commitment of APM to address the economic, environmental, and social goals of the project. In addition to the company's sustainable performance statements, the collaboration agreements signed with public institutions or local stakeholders, such as a joint project to improve the quality of life of artisanal fishermen in the area, provide support to the

		ongoing efforts of APM regarding sustainability beyond the scope of the project. Since July 2011, the company started the implementation of an intensive social responsibility program combined with the commitment to care for and protect the environment by trying to reduce the environmental impacts of port operations. Among the actions to modernize the port, electric cranes and last generation technology machinery were included to reduce the carbon footprint and improve operations standards. In these two years, APM Terminals Callao has developed various strategies to strength environmental management, such as monthly and bimonthly monitoring of air quality, vibration, noise, seawater, marine sediments and biological evaluation of wildlife in the area of direct influence of the North Terminal to ensure the environmental control of the Puerto del Callao. Additionally, since February 2013 APM has had a waste recycling operation, having a positive return in economic, social and environmental costs contributing to the sustainable development of the organization and the community. However despite all the aforementioned achievements it is necessary to document how are they meeting those aims.
		Source: *AMP Terminals Callao. Reporte de Sostenibilidad. July 2011 - June 2013* *AMP Terminals Callao. Política de seguridad, salud, medio ambiente, y calidad.* *Convenio Marco de Cooperación entre el Ministerio de la Producción y APM Terminals Callao S.A.* *Consorcio FCC-JJC. Plan de manejo ambiental.* *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.*
		RECOMMENDATIONS The sustainable policies and strategies implemented by APM are translated into actual practice, with various examples of activities undertaken and different levels of performance achieved. Although effective leadership and commitment has been demonstrated, to keep improving sustainability goals the project should seek to restore environmental conditions and societal systems by expanding further actions in the indirect area of influence, where problems such as lead pollution and insecurity among the population are affecting the daily life of the port's neighbors.
LD1.2 Establish A Sustainability Management System	**7**	**Superior**
		Functions, roles, responsibilities, and lines of authority for addressing sustainability are clearly assigned in the management system of the port of Callao project, as shown in the organizational charts in the plans provided by APM. The management team of Health, Safety, Environment and Quality has the functions of planning, implementing, and monitoring actions on the axes of safety, occupational health, physical protection of facilities, emergency response services and environmental protection. The goal is to promote the continuous improvement of the various offices of the organization. Additionally, the business processes and control mechanisms consider managing changing conditions, especially handling unexpected events, such as human-made or natural disasters that can affect the port's operations. In terms of the project's scope and complexity, this megaproject involves an investment of more than US $750 million, the enlargement of the port's site from 53.6 ha to 89 ha, five stages of development, a substantial increase in the port's operations, and more than 1,300 employees. Considering these facts, the project affects a broad area, with direct and indirect influence; therefore the management structure integrates different instances of participation to gather the opinions of all stakeholders involved, including the affected population, suppliers and contractors. In the plans presented, the commitments of the project's team to achieve sustainability objectives and targets are aligned with community needs.
		Source:

		Consorcio FCC-JJC. Plan de Manejo Ambiental. FJE-07. Sistema de Gestión Ambiental. (6) Funciones y Responsabilidades de la Implementación y Ejecución del Plan / FJE-08. Controles Ambientales Golder Associates. Mapeo de Grupos de Interés APM Terminals. Agosto de 2014 Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. Julio 2014. APM Terminals. Mapa de procesos.
		RECOMMENDATIONS *Even though roles and responsibilities to achieve sustainable performance are clearly defined in the information provided, the* coordination among the project's authorities is not clear. The sectoral approach adopted by the project's management could cause them to miss some of the opportunities and synergies between different areas. Moreover, the project provided different instances of participation to all stakeholders involved in the project, but it is not clear how those opinions are translated in the decision making process. Looking towards the future, the management system of the port of Callao should include policies to assure coordination among different management areas, and at the same time look for mechanisms to achieve a meaningful integration of the stakeholders.
LD1.3 Foster Collaboration And Teamwork	**1**	**Improved**
		Even though roles and responsibilities to achieve sustainable performance are clearly defined in the information provided, the coordination among the project's authorities is not clear. The sectorial approach adopted by the project's management could cause them to miss some of the opportunities and synergies between different areas. Moreover, the project provided different instances of participation to all stakeholders involved in the project, but it is not clear how those opinions are translated in the decision making process. Looking towards the future, the management system of the port of Callao should include policies to assure coordination among different management areas, and at the same time look for mechanisms to achieve a meaningful integration of the stakeholders.
		Source: AMP Terminals Callao. Reporte de Sostenibilidad. July 2011 - June 2013
		RECOMMENDATIONS Considering a systemic approach could be an opportunity to achieve higher levels of sustainability; in addition, the application of new methodologies and technologies could lead to a collaborative process to optimize the overall performance of the port. Moreover, formalizing the sharing of risks and rewards in the contracts between the project owner and the project team is an important step to consider in advancing sustainable performance.
LD1.4 Provide For Stakeholder Involvement	**5**	**Enhanced.**
		Within the social responsibility policy implemented by APM is a process for generating partnerships and networks with stakeholders to contribute to the program for local sustainable development. With that purpose in mind, the identification of all stakeholder groups was conducted and information was exchanged for broader involvement and relationship building. Thus managers have been responsible for maintaining the relationship with the various stakeholders through meetings, whether private or public.

		APM Terminals Callao has a transparent relationship with the communities, which is maintained through meetings to inform the community about the project and also to gather their comments and concerns, such as the general audience for the approval of the Environmental Impact Study. In addition, the team at APM Terminals Callao is an active member of several organizations, such as workers unions and community committees, which allows them to have a close relationship with all stakeholders. The documentation provides detailed identification and overview of the concerns and issues of key stakeholders, but no documentation is provided to show how the community input was integrated into the project and which are the changes and actions involved in decision-making process.
		Source: *Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. Asuntos Sociales* *Golder Associates. Mapeo de Grupos de Interés APM Terminals. Agosto de 2014* *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capítulo 5.0 Plan de Participación Ciudadana* *Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Gestión Social. Julio 2014.* *APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. 4.3 Diagnóstico del Medio Socioeconómico y Sociocultural* *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao, Evaluación de impacto sobre la pesca artesanal de los proyectos de modernización de la terminal de Norte Multipropósito y Modernización del DPA, Marzo 2014.*
		RECOMMENDATIONS There is opportunity to improve the depth and breadth of community participation in the port. Despite efforts made by APM in this realm, public participation is still mostly informative, however, the process should also be an opportunity to provide meaningful input to the project. Moreover, the input received from the community should be documented and integrated into the decision-making process of the port construction and operations.
LD2.1 Pursue By-Product Synergy Opportunities	**0**	**No Score**
		During the phases of construction and design of the modernization of the port of Callao no considerations were taken into account to integrate unwanted by-products or discarded materials in the project. Nevertheless, during the phase of operations in February 2013 a program for waste recycling was implemented. Wood and metals waste resulting from the port's operations are segregated and subsequently marketed by authorized companies. During 2013, 236 tons of waste was recycled. This recycling program could be the starting point for a local by-product synergy strategy.
		Source: FERROCAS. Certificado de Destino Final. Febrero 2014 FCC JJC. Plan de manejo de residuos sólidos. Enero 2014 APM Terminals. Plan de Manejo de Residuos 2014 del Terminal Norte Multipropósito en Puerto del Callao. Enero 2014 APM Terminals Callao. Reporte de Sostenibilidad. July 2011 - June 2013
		RECOMMENDATIONS
LD2.2 Improve Infrastructure	**1**	**Improved**
		Credit detail

Integration		The project has remedied the space of the former railway station and integrated it into the port area in order to facilitate cargo operations. Thus, it was necessary to expand the total area of the project and alter the flow of traffic. These measures contributed to a decrease in mobility of the workers using public transportation. No documentation is provided to evaluate the commitment of APM to resolve the situation by implementing design improvements to integrate community infrastructure elements and facilitate the integration of the port with public transportation infrastructure. In addition, the conflict caused by the heavy traffic freight transportation of the port and the light traffic of the residential neighborhoods remains unresolved. Solutions such as the construction of an elevated highway for heavy traffic are mentioned, but no concrete actions to measure the progress of the project are offered.
		Source: Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Mapa del proyecto completo
		RECOMMENDATIONS In this realm, the project can improve its performance by integrating the city's existing infrastructure with the port. The resolution of the conflict between the heavy traffic related to the port activity and the light traffic in the residential neighborhoods is an urgent matter. Studies to address the infrastructure deficit at a city level are needed to evaluate possible solutions and scenarios to solve this conflict which, when restored, would improve the economic growth and development capacity of the community. In addition, the connection between public transportation systems and the port should be reassessed.
LD3.1 Plan For Long-Term Monitoring & Maintenance	**3**	**Enhanced**
		In terms of the modernization of the port's infrastructure, a consistent plan for maintenance is undertaken to ensure the safe operation of all equipment in the port, in order to avoid danger to the port workers. The program of constant inspections and equipment maintenance implemented by APM ensures that the design performance of the overall port activities will be maintained throughout the lifespan of the project. Similarly, in relation to the ecological protection measures contemplated in the environmental management plan, weekly and monthly monitoring is conducted. In relation with environmental monitoring, weekly assessments are conducted to monitor or air quality, water quality, and residues; environmental inspections are scheduled twice per month; and environmental monitoring information is reported monthly.
		Source: Consorcio FCC-JJC. Programa de Actividades de Medio Ambiente, 2014 Consorcio FCC-JJC. Presupuesto Ambiente, 2014 Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capítulo 10. Costos Ambientales.
		RECOMMENDATIONS Considering the 30 year concession contract and the possible expansion of the port's lifespan beyond the concession period, further specification is necessary in relation to the funding allocation for monitoring and maintenance in future stages of the project. Even if personnel and resources are identified in the short and medium term, it is recommended to provide a detailed comprehensive long-term plan for monitoring and maintenance to assure that the necessary resources will be in place to fund the activities.

LD3.2 Address Conflicting Regulations & Policies	**2**	**Enhanced**
		A systematic assessment of the laws, regulations, policies and standards applicable to the port is provided. Utilizing this assessment, the Environmental Management Plan integrates the elements necessary for operational control to ensure compliance with legal requirements and other commitments for the project sustainability goals. These control elements are based on the realization and implementation of inspections, standards, procedures, programs, etc. Additionally, APM detected two potential conflicts between the existing regulations and their efforts to improve performance; therefore the team approached Peruvian authorities to devise alternatives to address these issues. In terms of the port workers, APM is in conversations with the Peruvian Ministry of Work to modify the existing law for port workers with the objective of providing more stability to their employees. APM is also lobbying political authorizes to allow the entry of international companies to Peruvian ports, which is forbidden by the current Cabotage law. The company believes this is a sustainable solution that will benefit the country, generating more trade in the provinces and investment in its ports. However don't equating 'sustainable solution' with a pure economic metric, which would be very antithetical. Such a solution would only be 'sustainable' if it fosters well-being, community, equality, environmental balance, etc. in addition to any economic benefit.
		Source: Consorcio FCC-JJC. Plan de manejo ambiental. FJE-05. Requisitos Legales Ambientales Aplicables
		RECOMMENDATIONS For future stages of the project, design and construction standards and practices need to consider new problems arising from sustainability. Moreover, some of the systems currently in operation, such as water and electricity consumption for the port activities, could be modified or re-evaluated in other to reuse greywater or prioritize renewable energy sources. In order to implement these practices, further studies should be made regarding the existing regulations to avoid possible conflicts.
LD3.3 Extend Useful Life	**3**	**Enhanced**
		The concession contract, signed in July of 2011, has a duration of 30 years, including the construction phase during the first 10 years. However, the modernized port has been designed to last at least 50 years and is expected to last 100 years. Therefore, the project has taken into account a deeper dredging than required for current operations, as well as the acquisition of the largest and most modern cranes. These specific considerations allow for expanded functionality of the port beyond the point of delivery, but no considerations are addressed regarding the new construction design, such as the administrative building. Moreover, the sustained economic growth of Perú in recent decades indicates that the design of the port should consider expansion and reconfiguration; therefore, both operations and construction should address the possibility of future changes in uses or capacities.
		Source: Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capítulo 9. Medidas de Cierre o Abandono Consorcio FCC-JJC. Plan de manejo ambiental. FJE-19.
		RECOMMENDATIONS In future phases of the project, flexibility to enable reconfiguration and refurbishment in the project should be included; this will enhance resilience in case of extreme events and the durability of the new infrastructure. It is recommended to include a feasibility study to identify the key areas where increasing

		investment in extending useful life of the port offers a reasonable payback.
LD0.0 Innovate Or Exceed Credit Requirements		*N/A*
	31	
CATEGORY II: CLIMATE AND ENVIRONMENT		
RESOURCE ALLOCATION		
	Score	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**
RA1.1 Reduce Net Embodied Energy	**0**	**No Score** APM Terminals Callao has not considered a Net Embodied Energy Analysis of the port facilities. Therefore there is no documentary basis in order to be evaluated. *Source: N/A* *RECOMMENDATIONS* The next step to improve sustainable standards will be to consider the Net Embodied Analysis assessment as a design strategy for life cycle energy efficiency. It is not required by local standards but this analysis will be essential to understanding life cycle energy use, especially when considering future expansions.
RA1.2 Support Sustainable Procurement Practices	**2**	**Improved** APM Terminals Callao implemented an innovative system entitled E-Auctions for materials and equipment purchase during port expansion, which is still used today during operations. This system aims to conduct faster, more transparent and efficient transactions, reducing costs and time. This makes APM Terminals Callao one of the regional leaders in electronic and open procurement practices. It is developing electronic supply capacities for manufacturers and suppliers of the region. At the same time all suppliers are previously approved through an integral process that applies to different areas such as commercial, human resources, financial, health, quality, environment, security and social responsibility. This is been translated into both economic and energy efficiency (avoided emissions related to commuting), materials (printed documents, when comparing electronic transactions vs. traditional face-to-face processes. *Source:* Reporte de Sostenibilidad, E- Auctions, Julio 2011-Junio 2013. Consorcio FCC-JJC, Guia Homologación de proveedores. APT Terminals Corporación Hodelpe Homologación del Perú, proceso de homologación de proveedores, 2014 *RECOMMENDATIONS* The next step to improve sustainable standards will be to consider further development of the E- Auctions methodology. Documenting empirical evidence of local supplier dynamics would allow the project to measure the impact of sustainable procurement practices and social responsibility. They could also identify more precisely what percentage of materials is acquired from manufacturers that meet sustainability requirements. Finally it is also important to make sure that electronic practices are not

		marginalizing prospective suppliers who may have limited access to the Internet. A study is also encouraged in order to assess this issue.
RA1.3 Used Recycled Materials	**5**	**Enhanced**
		The project aims to expand and improve old port facilities in order to access new global markets; therefore, APM Terminals Callao has always conceived this venture from a recycling perspective. The project included the redesign and reuse of previous spaces including grain warehouses, administrative buildings, and the container yard. The project has also overseen the deconstruction and recycling of heavy equipment, such as Port Terminal Cargo Handling Equipment, small supporting equipment and materials from demolitions. These actions result in a high level of reuse of existing structures on site, reducing the use of virgin materials. At the same time, according to design specifications at the waste management project, a high level of material from demolition and during construction has been recycled. Despite the clear evidence of recycling the project would be benefited from a more clear description of recycled material percentages used in order to award more points, missing the opportunity to higher score in this credit.
		Source: Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capitulo 3: Área de Influencia Consorcio FCC-JJC. Plan de manejo ambiental. FJE-19. APT TERMINALS, Plan de manejo de residuos, Terminal multipropósito del puerto del Callao, versión Enero, 2014 Consorcio FCC-JJC. Certificados de Material Reciclado Ministerio de Perú. Organismo de evaluación y Fiscalización Ambiental, ley general de residuos sólidos, Ley 27314, modificada por decreto legislativo. Gobierno Regional del Callao, Dirección Regional de Salud del Callao, registro empresa comercializadora de residuos sólidos (EC-RS) 2012, 2013 y 2014
		RECOMMENDATIONS The next step will be to consider a more detailed project that documents the reuse and recycling process through a more rigorous methodology, like Net Embodied Energy Analysis. This would entail more detailed evidence, including inventory and design documents showing specific location and weight or volume of reused structures or materials. It is encouraged to develop a new chapter for the E-auctions methodology which could include more detailed specifications to identify suppliers of materials that are reused or recycled.
RA1.4 Use Regional Materials	**6**	**Enhanced**
		The project's use of E-Auctions for materials and equipment suppliers is making APM Terminals Callao one of the regional leaders in electronic and open procurement practices. The local supplier certificates present evidence of at least 60% locally sourced materials during construction.
		Source: Reporte de Sostenibilidad, E- Auctions, Julio 2011-Junio 2013. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Capitulo 3: Área de Influencia.
		RECOMMENDATIONS Consider a further stage development of the E- Auctions methodology. It is important to make sure that

		electronic practices are not marginalizing certain possible suppliers with limited access the Internet. A study and interphase development to identify these prospective local suppliers is encouraged. Finally, more detailed specifications of sources within the required distance would be beneficial.
RA1.5 Divert Waste From Landfills	**6**	**Enhanced**
		APM Terminals Callao designed this venture to be in compliance with Environmental and Waste management laws. As a result, since its conception the project has included a set of design specifications for waste management in the Plan de Manejo de Residuos Sólidos (Waste Management Plan), which was developed by a third party. This set of specifications describes a very clear process for waste management at different levels: analysis of waste generation, collection according to classification of waste, disposal to different places according to classification, and different contractors transporting wastes to achieve the recovery plan. Dangerous or toxic waste received specific attention. At the same time the plan included training for all construction workers in order to implement all the specifications of waste management. A third party formed by the waste management consultancy group monitors the performance and accuracy of the waste management plan. Finally the Agency for Environment monitored this process. As a result there is evidence of a high level of achievement equivalent to 50% of material from demolition, such as steel, and during construction-- wood, paper, etc.-- that has been managed according to waste management plan specifications and environmental law.
		Source: Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Reporte de Sostenibilidad, E- Auctions, Julio 2011-Junio 2013. Consorcio FCC-JJC. Plan de manejo ambiental. FJE-19. APT Terminals Callao S.A., Informe de Gestión Ambiental, semestral 2014, Anexo 1.3 Consorcio FCC-JJC, informe de recolección y manejo de residuos sólidos, 2013-2014.
		RECOMMENDATIONS The next step to improve sustainable standards will be to develop a system that centralize the information of collected materials going to landfills in order to develop a deeper analysis and enable more recycling. At the same time it would be valuable to analyze more detailed information in order to more accurately measure the specific percentage of materials going through waste management.
RA1.6 Reduce Excavated Materials Taken Off Site	**0**	**No Score**
		There is no documentary basis for this credit in order to be evaluated.
		Source: N/A
		RECOMMENDATIONS Even though there is no documentary basis for this credit, it is important to highlight that during the expansion project there is evidence of a reduction of excavated materials taken off site. Documentation of this practice would be a great opportunity to inform future projects.
RA1.7 Provide for	**0**	**No Score**
		As specified by the project team, APM Terminals Callao does not consider conducting a deconstruction &

Deconstruction & Recycling		recycling project for the port facilities. Even though there is no documentary basis for this information in order to be evaluated, it is important to highlight that during the expansion project there is some evidence of deconstruction and recycling of heavy equipment, such as port terminal cargo handling equipment, cranes, and additional types of machinery.
		Source: N/A
		RECOMMENDATIONS The next step to improve sustainable standards will be to develop a Deconstruction & Recycling project for the port facilities as a design strategy for life cycle efficiency. It is not required by local standards, but this analysis will be useful to document local empirical knowledge already developed through deconstruction and recycling of previous facilities. This step would be useful when considering future expansions or considering the use of equipment in other locations after the lease ends in 30 years.
RA2.1 Reduce Energy Consumption	**3**	**Improved**
		Taking advantage of their global experience, APM Terminals Callao implemented a new generation of port terminal cargo handling equipment in order to reduce energy consumption during operation and maintenance. The project aims not only to achieve fast-paced operations and more efficient use of energy, but also to reduce overall operation and maintenance costs throughout the project life cycle. This is been translated into direct economic savings of more than 12% in energy consumption and 15% in maintenance costs during operations.
		Source: PPT sobre grúas móviles
		RECOMMENDATIONS The next step to improve sustainable standards will be to use the energy consumption analysis to inform design strategies for project life cycle energy efficiency. It is not required by local standards but this analysis will be useful to document empirical knowledge already developed by the project team in order to inform future projects.
RA2.2 Use Renewable Energy	**0**	**No score**
		APM Terminals Callao is one of the global leaders promoting the use of renewable energy sources in port services operations. All of the new Port Terminal Cargo Handling Equipment uses electric energy, replacing previous diesel equipment. On the other side, it is not proven that the energy supplied to the port is from sustainable sources. Endelnor company that supplies energy to the facility, obtain certain percentage from sustainable sources, but it cannot be proven that there is a clear linkage among both.
		Source: PPT sobre grúas móviles Estudio de Hidroeléctricas
		RECOMMENDATIONS The next step to improve sustainable standards will be to have a clearer process to verify that electricity is produced by renewable sources
RA 2.3 Commission &	**3**	**Enhanced**

Monitor Energy Systems		Having learned from their vast experience in port operations around the globe, the project team at APM Terminals Callao implemented an energy systems monitor in all of the cargo handling equipment, which allows monitoring of energy consumption during operation. At the same time all operators have been trained by the project team of Liebherr / ZPMC China (the Cargo Handling Equipment manufacturers). The manufacturers also trained the in-house maintenance team to ensure efficient functioning and extended useful life. Finally, as part of the monitoring strategy, the project team contracted with Royal Haskoning and Ecotec as third party commissioning supervisors. This has resulted in energy consumption savings as compared to previous equipment and less maintenance during operations.
		Source: Consorcio FCC-JJC. Certificate of Supervision by Royal Haskoning sucursal Peru, Enhancing Society Together, 13 Agosto 2014 Consorcio FCC-JJC.Resumen base de datos del centro de capacitación 2013-2014
		RECOMMENDATIONS The next step to improve sustainable standards will be to develop a system that centralizes the information collected in the monitoring of equipment in order to develop a deeper analysis that can help the project achieve more efficient use of energy. At the same time it would be valuable to analyze a parallel source of energy supply from renewables, such as wave energy production.
RA3.1 Protect Fresh Water Availability	**0**	**No Score**
		As specified by the project team, APM Terminals Callao did not consider biological monitoring. There is no evidence to evaluate this credit.
		Source: Consorcio FCC-JJC. Certificate of Supervision by Royal Haskoning sucursal Peru, Enhancing Society Together, 13 Agosto 2014
		RECOMMENDATIONS There is an opportunity to develop an analysis of freshwater resources in order to reduce the negative net impact on freshwater availability in quantity and quality.
RA3.2 Reduce Potable Water Consumption	**0**	**No Score**
		The project team implemented a program to train employees to reduce overall water consumption. They are also considering implementing new technology to reuse and recycle water, but the impact of these strategies is still low in terms of overall percentage of water consumption.
		Source: Consorcio FCC-JJC., Campaña de ahorro de agua y Luz, 2014
		RECOMMENDATIONS The next step will be to consider a full analysis of all water systems in order to identify critical areas of opportunity as well as to evaluate feasibility and cost to determine the most effective methods for potable water reduction and eventually incorporate them into the design.
RA3.3 Monitor Water Systems	**0**	**No Score**
		As specified by the project team, APM Terminals Callao undertook a water system analysis of the port facilities in order to reduce consumption. At the same time, different stations are located along the coast in order to monitor ocean water contamination. However, there is no evidence of clear and specific actions being taken, consequently there is no basis on which to evaluate this credit.

		Source: Consorcio FCC-JJC., Reporte de resultados analisis, Agua para el consumo, 2013- 2014 Consorcio FCC-JJC. Mapa Puntos de Muestreo Agua, Aire y Vibraciones, 2013-2014
		RECOMMENDATIONS The next step to improve sustainable standards will be to consider the results of the water system analysis and monitoring of ocean water, as these issues can inform design strategies that incorporate ways to monitor water performance during operations and to remediate any possible ocean water contamination.
RA 0.0 Innovate Or Exceed Credit Requirements		*N/A*
	25	
NATURAL WORLD		
	Score	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**
NW1.1 Preserve Prime Habitat	**9**	**Superior**
		The Terminal Norte Multipropósito del Callao project aimed to expand and improve old Port facilities, avoiding placing a new project on additional land. In this sense the project supports the preservation of prime habitat by infilling already developed land rather than producing an additional ecological footprint on virgin lands. A third party study on environmental impact evaluation and activities demonstrates that no areas of prime habitat are located on–site or within the specified distance of development according to environmental law.
		Source: Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS In order to further contribute to the preservation of prime habitat, the ATP team could promote local programs aiming to protect areas of prime habitat through restoration of vegetation or natural habitats within identified surrounding areas.
NW1.2 Preserve Wetlands and Surface Water	**0**	**No Score**
		According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities), the project is situated on a coastal site but is not located within the specified distance of vernal pools, wetlands, shorelines, or drinkable water bodies. Consequently, there were no actions taken to protect, buffer, enhance or restore wetlands or surface water. As a result there is no basis to gain a score in this

		credit.
		Source: Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS In order to have a deeper contribution to the environment, ATP could promote local programs aiming to restore previously degraded buffer zones on another previously developed site
NW1.3 Preserve Prime Farmland	**12**	**Conserving**
		The project team and a third party assessed the project site, determining that the location is not identified as prime farmland of statewide importance according to the Environmental Impact Evaluation. Consequently, the expansion and improvement of the old port facilities does not have a negative impact on any vegetation and soil protection zone (VSPZ). In this sense the project supports the preservation of prime farmland by reusing developed land rather than producing an additional ecological footprint on farmland.
		Source: Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS In order to have a deeper contribution to the natural world criteria, ATP could promote local programs aiming to preserve or restore prime farmland within identified surrounding areas.
NW1.4 Avoid Adverse Geology	**3**	**Superior**
		The project team and a third party assessment by Environmental Impact evaluation determined that the location of the project is not in an adverse geological formation or over aquifers. However, due to its nature as a port project, there is risk in coastal areas for tsunamis. Consequently, expansion and improvement of the port facilities includes a natural hazard risk management and action plan in case of emergency (Plan de preparación y respuesta ante emergencias naturales).
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014.

		APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Mapa de Geología. Diciembre 2011.
		RECOMMENDATIONS Despite the evidence of protection and risk management through the natural hazards plan, it is important to identify the level of implementation of the plan. At the same time, additional strategies such as buffer zones, prevention plans, and cleanup plans could be developed further to reduce the risk and fully define the port's safety zone.
NW1.5 Preserve Floodplain Functions	**0**	**No Score**
		According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities) and the rainwater study, the project is not situated on a floodplain. APM Terminals Callao does not consider limiting development impacts in order to maintain water management capacities and capabilities. Consequently there is no basis upon which to evaluate this credit.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS The next step to improve sustainable standards in this category would be to consider limiting the use of impervious surfaces to allow ground water infiltration and maintaining or enhancing the vegetation and soil protection zones.
NW1.6 Avoid Unsuitable Development on Steep Slopes	**0**	**No Score**
		According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities), the project is not situated on steep slopes. Consequently, there is no basis to evaluate this credit.
		Source: *Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014.* *Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.* *APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.*
		RECOMMENDATIONS Further studies to evaluate erosion caused by port operations are encouraged.
NW1.7 Preserve Greenfields	**23**	**Restorative**
		According to the nature of the project The Terminal Norte Multipropósito el Callao aimed to expand and improve old port facilities according to new global markets, consequently APM Terminals Callao conceived this venture from a recycling perspective. The project includes the redesign and re-use of a site deemed a brownfield by local state-federal government agencies. As a result the project included a brownfield

		remediation plan that was carried out during construction.
		Source: Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. Memoria fotográfica de la construcción y mejoramiento y tratamiento suelos contaminados
		RECOMMENDATIONS It is encouraged to document more rigorously the empirical experience of brownfield remediation plans according to local techniques and local knowledge in order to identify the key contributions to greenfield preservation.
NW2.1 Manage Stormwater	**0**	**No Score**
		The Terminal Norte Multipropósito del Callao project included a Greybrown and Brownfield remediation plan that was carried out during construction. According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities) and the stormwater study, the project doesn't obstruct or have a significant impact on runoff quantity and quality, however infiltration, evapotranspiration, greenfield or water harvesting areas were not considered due to the small amount of rainwater average in the coastal zone of Peru. Consequently, the percentage of storage capacity is not significant to gain score in this credit.
		Source: *Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. A.*
		RECOMMENDATIONS In order to have a deeper contribution to managing stormwater, the ATP team could study how to incorporate water storage areas or to reuse water. They can also promote local programs aiming to restore previously degraded buffer zones to a natural state on another previously developed site.
NW2.2 Reduce Pesticides and Fertilizer Impacts	**0**	**No Score**
		As specified by the project team APM Terminals Callao, during the Port Terminal cargo handling process there is no nonpoint source pollution or persistence of pesticides or fertilizers on site, nor the need for the use of these materials. Consequently, it is not possible to gain a score in this credit.
		Source: Consorcio FCC-JJC. Plan de manejo ambiental. FJE-18. A.
		RECOMMENDATIONS Even though there is no pesticide or fertilizer use within the Port Terminal cargo handling process, in order to have a deeper contribution to Natural World criteria, the ATP team could study to promote local programs aiming to teach their workers and the local population about the impact of pesticides and fertilizers and to promote the consumption of organic products in local cafeteria or restaurants.
NW2.3 Prevent Surface and Groundwater Contamination	**18**	**Restorative**
		Since the conception of the project, APM Terminals Callao conceived this venture from a recycling perspective. The project included a brownfield remediation plan that was carried out during construction. The project prevents future contamination by cleaning up previously contaminated land, restoring

		wellhead protection, and installing land use controls to prevent future contamination. In addition, the project team and a third party assessment by Environmental Impact Evaluation identified that chemicals could be a source of contamination during a tsunami, earth quake, fire or explosion. Consequently, the expansion and improvement of the port facilities includes a risk management and action plan in case of emergency (Plan de preparación y respuesta ante emergencias) in order to prevent damage and contamination to the sea. Different sections of this plan include key installations and representatives for protection and risk management (the risk management and emergency committee), risk evaluation and levels of emergency according to labor-related or natural events, operational procedures for workers to prevent risk, and training and simulation according to different emergency cases. The procedures also includes the management of hazard areas, dangerous liquids management and runoff controls. Finally, the plan is subject to revision and evaluation after every emergency.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS Despite evidence of a protection and risk management plan, it is important to verify the level of implementation of the plan. At the same time, additional strategies could include spill and leak monitoring, runoff interceptors, and drainage channels designed to collect pollutants in stormwater or ice melt.
NW3.1 Preserve Species Biodiversity	**0**	**No Score**
		According to the Plan de Manejo Ambiental (study on environmental impact evaluation and activities), the project is not situated on a site with biodiversity that has to be preserved or restored. However, by its nature as a port project, it has a strong influence on the oceanfront and its marine species biodiversity. In these two years, APM Terminals Callao has also developed various strategies to strengthen environmental management, such as monthly and bimonthly monitoring of air quality, vibration, noise, seawater, marine sediments and biological evaluation of wildlife in the area of direct influence of the North Terminal to ensure the environmental control of the Puerto del Callao. However there is no clear evidence of action strategies on this issue, consequently, there is no basis to evaluate this credit.
		Source: Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS ATP could promote local programs aiming to preserve species biodiversity within surrounding areas. The team can pay more attention to the oceanfront in its further plans for deep excavation and expansion of the canals for larger ships. Specifically, it is necessary to make sure that future development on the oceanfront does not damage natural marine habitats and that ship traffic does not cause water pollution, which can negatively alter marine life.

NW 3.2 Control Invasive Species	**0**	**No Score**
		As specified by the project team, APM Terminals Callao and the Plan de Manejo Ambiental (study on environmental impact evaluation and activities) did not include greenfield areas. The project team did not take any action on this item, consequently there is no basis upon which to evaluate this credit.
		Source: Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS In order to have a better contribution to the Natural World criteria, the ATP team could promote local programs aiming to preserve locally appropriated plants and identify and avoid any invasive plants by referring to the list provided in the State Noxious Weeds within identified surrounding areas.
NW3.3 Restore Disturbed Soils	**8**	**Conserving**
		The project did not provide evidence of restoring ecological and hydrological functions of the soil, However there is high evidence that one of the main contributions of the project is based on the brownfield remediation plan which restored soils disturbed by previous development.
		Source: Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS ATP could promote local programs aiming to restore additional areas and enhance ecological and hydrological functions.
NW3.4 Maintain wetland and surface water functions.	**0**	**No Score**
		As specified by APM Terminals Callao and the Plan de Manejo Ambiental (study on environmental impact evaluation and activities), the project is not situated on a site that includes streams, wetlands or surface water resources. Consequently the project team did not take any action in this field and there is no basis to evaluate this credit.
		Source: Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.

		RECOMMENDATIONS ATP could promote local programs aiming to maintain and restore the ecosystem functions of streams, wetlands, and water bodies in surrounding areas.
NW 0.0 Innovate Or Exceed Credit Requirements		*N/A*
	73	
CLIMATE AND RISK		
	Score	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**
CR1.1 Reduce Greenhouse Gas Emissions	**0**	**No Score**
		To reduce the greenhouse gas emissions, the credit asks for a long-term and comprehensive life cycle carbon analysis and a plan to reduce the anticipated amount of net greenhouse gas emissions during the life cycle of the project. The project has not done this, therefore here is no basis on which to evaluate this credit.
		Source: N/A
		RECOMMENDATIONS It is highly encouraged to document greenhouse gas emissions in order to inform a long term and comprehensive life cycle plan, so that they can identify opportunities to reduce greenhouse gas emissions during the 30 year contract period for operations.
CR1.2 Reduce Air Pollutant Emissions	**2**	**Improved**
		Once the project is finished it will emit less air pollution than before, even though the project is not following any specific assessment such as the California Ambient Air Quality Standards or others. The project team identified that in a port terminal the key to reducing emissions is in the cargo handling process. Consequently, the team implemented next generation equipment that works with electric energy instead of diesel. This has resulted in carbon monoxide, nitrogen dioxide and ozone reductions. At the same time the operations include a new underground system to transport grain and other goods, avoiding further emissions into the air. Air pollutant emissions have been considerably reduced compared to previous standards used.
		Source: Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS In order to have a deeper contribution to the reduction of air pollutant emissions, further studies are

		encouraged in order to possibly adopt the California Ambient Air Quality Standards or another strict standard.
CR2.1 Assess Climate Threat	**0**	**No Score**
		APM Terminals Callao considers a natural hazards emergency plan that covers certain climate threat issues, but the team did not consider a specific Climate Impact Assessment and Adaptation Plan. Even though the emergency plan reflects some strategies to tackle environmental risk, its impact is still limited.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS There is a great opportunity for the natural hazards plan (Plan de preparación y respuesta a emergencias) to evolve into a comprehensive Climate Impact Assessment and Adaptation Plan. This plan should include design variables and associated assumptions used in the design of the project comparing those assumptions to the potential impacts of climate change over the design life of the project.
CR2.2 Avoid Traps And Vulnerabilities	**0**	**No Score**
		Despite the fact that the project team ordered the Plan de Manejo Ambiental (study on environmental impact evaluation and activities), APM Terminals Callao did not assess potential long-term traps, vulnerabilities and risks due to long term changes such as climate change. Consequently there is no basis to evaluate this credit.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS There is a great opportunity for further study of potential long-term traps, vulnerabilities and risks due to the long-term changes during the 30 year operational period and beyond. This plan should identify and assess possible changes in key engineering design variables.
CR2.3 Prepare For Long-Term Adaptability	**0**	**No Score**
		The project team did not consider conducting a Long-Term Adaptability plan.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18.

		Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS It is encouraged to evaluate the port infrastructure system to be resilient in order to maintain performance under altered climate conditions or to adapt to other long term change scenarios.
CR2.4 Prepare For Short-Term Hazards	**3**	**Improved**
		The project team had a third party assess natural hazards, identifying the risk of coastal areas as susceptible to tsunamis. Chemicals management was identified as the key issue and a potential source of contamination during a tsunami, earthquake, fire or explosion. The plan provides a list of likely natural and manmade hazards at the site for the next 25 years. Consequently, the port includes a risk management and action plan in case of emergency (Plan de preparación y respuesta ante emergencias) in order to prevent damage and contamination to the sea. This plan also describes steps taken to improve protection measures such as: key installations and representatives for protection and risk management (the risk management and emergency committee), risk evaluation and levels of emergency according to risks, operational procedures to prevent risk and training and simulation according to different emergency cases. The procedures also include management of hazard areas, dangerous liquids management and runoff controls. Finally, the plan is subject to evaluation and revision after every emergency.
		Source: Consorcio FCC-JJC. Plan de Preparación y respuesta de emergencias. FJE-18. Territorio y Medio Ambiente S.A.C. APM Terminals Callao Informe de Gestión Ambiental Semestral. 11.. Julio 2014. Walsh & EGP. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao. APM Terminals Callao. EAP Proyecto de Modernización del Terminal Norte Multipropósito en el Terminal Portuario del Callao.
		RECOMMENDATIONS Even with evidence of natural hazards protection and risk management plans, it is important to identify the level of implementation of the plan. The plan and design have the opportunity to implement a longer term vision and tackle a larger number of possible hazards beyond the 25-30 year period.
CR2.5 Manage Heat Island Effects	**0**	**No Score**
		APM Terminals Callao does not consider or analyze heat island effect. Consequently there is no basis on which to evaluate this credit.
		Source: N/A
		RECOMMENDATIONS

		There is an opportunity to study heat island effects in order to inform the project and implement specific strategies to minimize surfaces with a high solar reflectance index (SRI).
CR0.0 Innovate Or Exceed Credit Requirements		*N/A*
	5	
OVERALL:	**181**	**MODERNIZATION PROJECT OF THE MULTIPURPOSE NORTH TERMINAL IN PORT OF CALLAO (MNT)**

APPENDIX E: SOURCES

DOCUMENTATION PROVIDED
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APM Terminals. *Mapa de procesos.*
APT Terminals Callao Consorcio .A., Informe de Gestión Ambiental, semestral 2014.
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Consorcio Constructor FCC-JJC. *Evaluación de Protección de la Instalación (EPI)*. April, 2013
Consorcio Constructor FCC-JJC. *Plan de Protección de la Instalación (PPI).* April, 2013.
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Consorcio FCC-JJC. Certificados de Material Reciclado.
Consorcio FCC-JJC, informe de recolección y manejo de residuos sólidos, 2013-2014.
Consorcio FCC-JJC. Certificate of Supervision by Royal Haskoning sucursal Peru, Enhancing Society Together, 13 Agosto 2014
Consorcio FCC-JJC. Resumen base de datos del centro de capacitación 2013-2014
Consorcio FCC-JJC. Certificate of Supervision by Royal Haskoning sucursal Peru, Enhancing Society Together, 13 Agosto 2014.
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Consorcio FCC-JJC. Mapa Puntos de Muestreo Agua, Aire y Vibraciones, 2013-2014
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Gobierno Regional del Callao, Dirección Regional de Salud del Callao, registro empresa comercializadora de residuos sólidos (EC-RS) 2012, 2013 y 2014
Golder Associates. *Mapeo de Grupos de Interés APM Terminals*. Agosto de 2014
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Memoria fotográfica de la construccion y mejoramiento y tratamiento suelos contaminados
Ministerio de Peru. Organismo de evaluación y Fiscalización Ambiental, ley general de residuos sólidos, Ley 27314, modificada por decreto legislativo.
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