Environmental and Social Review Summary

Panama City Metro

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed in advance of the MIGA Board consideration of the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA’s activities. This document should not be construed as presuming the outcome of the decision by the MIGA Board of Directors. Board dates are estimates only.

Any documentation which is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country: Republic of Panama
Sector: Infrastructure
Project Enterprise: Panama Metro Secretariat (“SMP”)
Guarantee Holder: Citibank, N.A.
Environmental Category: A
Date ESRS Disclosed: July 19, 2011
Status: Due Diligence

A. Project Description

Citibank, N.A. ("Citi") has asked the Multilateral Investment Guarantee Agency ("MIGA") for Non-Honoring of Sovereign Financial Obligation cover for the construction of Line 1 of the Panama Metro (the “Project”) in Panama City. The Project consists of the greenfield construction (including the acquisition of rolling stock and the construction of depot and maintenance facilities) and operation of a 13.7 km Line-1 Metro between the northern Los Andes and south-west Albrook areas of Panama City. The bore tunnel section of the line will be 7 km long with 5 underground stations, and 6.3 km will be a viaduct section with 6 elevated stations. The metro line will also include 2 semi-underground, or trench stations.

The total project cost is estimated at US$1.9 billion, out of which US$1.5 billion is related to the turnkey EPC contract entered into by the Government of Panama ("GoP") with the “Line One Consortium”. The Line One Consortium is comprised of Construtora Norberto Odebrecht S.A. of Brazil (55%) – Consortium Leader, and Fomento de Construcciones y Contratas S.A. of Spain (45%). The project construction is in early stages, and only pre-construction work has started in a few station sites.

The Panama Metro Secretariat (“SMP”) is the EPC contract signatory on behalf of the GoP, and is a body created by Presidential decree in July 2009 with a mandate to “design, execute, manage, operate, and maintain the Metro”. SMP reports to the Panama Ministry
of the Presidency. For the purposes of overseeing the construction, and initial stage operations and management of the Metro, the Secretariat entered (November, 2010) into a five year project management and operation and maintenance contract with a Spanish-Venezuelan consortium. The consortium consists of engineering firm Ayesa (48%) of Spanish origin, the Venezuelan engineering company Inelectra (32%), and TMB, the entity that manages Barcelona's transportation systems (20%).

B. Environmental and Social Categorization

The project is a Category A under MIGA’s Policy on Social and Environmental Sustainability. The key social and environmental issues are land acquisition, economic and physical displacement of around 130 business owners (majority of which are microenterprises), community and workers’ health and safety, erosion, water and air pollution, flooding, noise, and spill management (particularly during the construction phase). Environmental programs and specific measures have been developed to address the identified negative impacts.

C. Applicable Standards

Although all Performance Standards are applied to the project, based on current information it is expected that the project will be managed in accordance with the following Performance Standards:

- PS1: Social and Environmental Assessment and Management System
- PS2: Labor and Working Conditions
- PS3: Pollution Prevention and Abatement
- PS4: Community Health, Safety and Security
- PS5: Land Acquisition and Resettlement

Since there are no protected natural habitats or recognized indigenous communities in the area of influence of the project, PS 6: Biodiversity Conservation & Sustainable Natural Resources Management and PS7: Indigenous Peoples do not apply for the purpose of MIGA’s review of this project. The environmental impact assessment does not indicate the presence of any cultural heritage and PS8: Cultural Heritage does not apply. But the SMP and the EPC contractors are required to have “chance find procedures” in place. Applicable local regulations will be applied.

D. Key Documents and Scope of MIGA Review

MIGA’s review of this project consisted of appraising environmental and social information submitted by Citi and SMP and a site visit in June 2011.

Documents reviewed by MIGA:
- Environmental Impact Assessment (EIA) – September/November 2010 prepared by URS Holdings Inc.
• Environment Management Plan (EMP) (November 2010) – prepared by URS Holdings Inc.
• Economic and Social Impact Study (November 2010) – prepared by Deloitte
• Strategic Plan for Compensation and Social Assistance of the Metro Line 1 of Panama (PCAS) – Framework for land acquisition and compensation - April 2011, prepared by SMP.
• Socioeconomic Study (Release of Right of Way) – (September 2010) – prepared by SMP including supplementary tables detailing the affected businesses and an inventory of structures.
• Draft Plan for Communication and Social Management prepared by SMP – April 2011.
• Examples of questionnaires and files for each affected property and business
• Hydrological and hydraulic analyses prepared by URS – May 2011.
• Public Forum minutes from December 15, 2010 (Foro Publico)

E. Key Issues and Mitigation

PS1: Social and Environmental Assessment and Management Systems
The EIA (2010) was prepared and submitted to the National Environment Authority (ANAM) for approval in accordance with the Panamanian national environmental permitting requirements. The EIA was approved by ANAM in February 8, 2011 with additional requirements for monitoring. ANAM has the authority to visit the project site for environmental monitoring purposes.

The EIA presents potential environmental impacts, main characteristics of the baseline, and description of mitigation measures. The metro line goes through the districts of Panama and San Miguelito, and the direct influence area is estimated at 425.279 ha. The project footprint covers 55.733 ha. The direct influence area of the project is densely populated urban settings, mostly occupied with commercial activities. Project affected areas do not have any agricultural use, and do not include protected wild life zones and natural habitats. Most of the metro line will be built above or below public roads where land belongs to the national government. However, the right-of-way (row) is occupied by mostly small businesses where the majority of them have permission from Panama and San Miguelito municipalities to operate. Economic and physical displacement is among the major impacts of the project. Baseline data for all affected businesses and estimates of compensation for structures affected by the project have been completed. The SMP has a framework for land acquisition and compensation and is committed to conduct land acquisition and compensation in compliance with MIGA’s Performance Standard 5.

The EIA indicates that the subsoil conditions are heterogeneous, and no evidence has been found that the soil conditions would compromise the feasibility of the project. However, about 70% of the project area has slight slopes less than 4%, which allows the construction without major difficulties. However, one stretch in Justo Arosemena Avenue the slope goes up to 9%. The project is located within Hydrographic Basin No. 142 known as Rivers, which is comprised of three rivers and two intermittent streams.
The project design includes detailed hydrological and hydraulic analysis to quantify both the design of flows and the hydraulic performance of the basin for high risk areas. These studies were presented to the Ministry of Public Works for their review and approval. Tides and swells are not expected to have significant impacts on the alignment.

Underground water is between 3 and 14 meters deep, which means that the tunnel might have the risk of running below the water table. Most significant threats are linked to erosion, rain and consequent probability of floods and landslides. Alignment of the metro line and especially station locations were moved (in some locations up to 200 meters) to avoid low level areas. One of the main concerns for flooding is the yard area, however, as it is close to the ocean there is an additional drainage system where flooding is expected to be eliminated. Drainage plans will be presented to the Ministry of Public Works for their review and approval. The hydrologic analyses will also be modified to add additional measures for climate change.

The Environmental Management Plan (EMP) consists of several programs: climate, air, noise and vibrations quality control, water and soil protection, flora and fauna protection, socioeconomic, management of transport sector and waste management.

Construction phase management: Tunnel boring machines (TBM) will be used as an alternative to drilling and blasting methods. TBM significantly reduces the cost of lining a tunnel which makes them more suitable to use in heavily urbanized areas. The construction consortium, “Line One Consortium” led by Odebrecht, developed a Construction Environmental Management Plan (CEMP) framework which presents detailed plans for flooding, erosion, noise and vibration, spoil, ground water, waste, dust, vehicle and plant emissions management, emergency response, and for occupational health and safety. The consortium will submit to SMP implementation reports every six months throughout the construction period. SMP is in the process of contracting an external auditor to monitor and assess the implementation of occupational health and safety and environmental measures of the consortium. The environmental baseline study (2009) will be updated to include additional information on four parameters: (i) water quality; (ii) air quality; (iii) noise, and (iv) vibration. Throughout the construction period monthly water monitoring will take place at major construction sites and quarterly at rivers and streams. Air quality monitoring will be conducted at major construction sites every 6 months in accordance with EIA and CEMR. To address the risk of flooding a local drainage system will be developed for the construction phase. Diverting the Curundu River is a part of the drainage system being developed. The potential erosion risk is foreseen for the pre-fabrication site (20 ha rented land) which is 8 km away from the r-o-w. Mitigation measures include containment, screening, and vegetation. Vibration impacts will be monitored and building inspections will be conducted to test if structures along the r-o-w are adequately protected against vibration as it may pose risk to community safety. However, the SMP’s environment/technical team does not see this as a high risk.

The surface water quality baseline data collected for the last nine years indicate that suspended solids were found to be above the acceptable standards. The consortium will
take necessary measures to lower the levels by including sedimentation ponds and screening. A significant amount of excavation is expected especially from construction stations – 70,000m³ per station – 1500m³/day. After the construction of the line, maintenance of the superficial drainage networks will be carried out.

During the operations phase it is ultimately the SMP’s responsibility as a project owner to ensure that the operation of the project will be performed in compliance with national regulations and international standards. A project management consortium will be established. Spanish-Venezuelan “TMB-Ayesa-Inelectra Consortium” will supervise operations and maintenance at least for the first year (the contract includes a one-year extension option) and will provide training for all operational staff. MIGA will require a detailed environmental, health and safety management plan for the operations phase of the project consistent with Performance Standards and applicable international standards and guidelines.

PS2: Labor and Working Conditions
Panama has ratified the core ILO Conventions on freedom of association, discrimination, child labor and forced labor. Line One Consortium’s labor practices for its direct and contracted workforce and HR policy are in line with Panamanian Labor Laws and the consortium leader, Odebrecht’s corporate principles.

According to a study prepared by Cajiao and Asociados for the SMP¹, the preliminary employment was estimated in about 3,000 direct workers. The actual estimate of Line One Consortium is 3,800 direct workers during the peak of construction, and the peak construction period for the sub-contractors will employ about 600 direct workers for Grupo de Empresas and 800 direct workers for the rest of the subcontractors. Estimates prepared by Deloitte for its Economic and Social Impact Study on the Panama Metro project direct employment during the first five years of the operating phase of the project are 833. The project construction will generate approximately 9,000 jobs that will relate primarily to the provision of supplies, food and other support services. The SMP will exert due effort to ensure requirements of PS 2 are applied to all contract workers.

Worker health and safety: Tunneling and cave-ins are significant risks to workers’ health and safety during the construction phase. Other risks are associated with the operations of high capacity hoisting equipment and electrical power installations. Line One Consortium’s occupational health and safety (OHS) procedures will include tunneling safety, including emergency rescue procedures for underground workings, use of explosives, as well as crane/lifting equipment safety.

All workers are obliged to undertake induction training before starting. Daily occupational health and safety dialogue “tool boxes” with all workers are conducted before they start the work day. Training for specific tasks (3 or 4 themes per month) is provided. Obebrecht’s Panama office is ISO 1800 and OHSAS certified. Odebrecht’s Human Resources policy and occupational health and safety standards will be applied throughout the construction phase for all construction workers, including sub-contractors’

¹ See Chapter 6, Section 8.2
workers, where all workers go through regular health checks every 12 months. The workers related to high risk jobs (such excessive noise and vibration jobs, chemical management, among others) will go through health checks every 6 months. Construction on the project site commenced in February and there have been no fatalities or serious accidents.

No workers camp/accommodations will be needed for either construction or operations phases. All construction sites will have a first aid system with access to a full time paramedic. An ambulance service will be sub-contracted and the consortium will have one in-house doctor available. All construction sites are in close proximity to local hospitals with the exception of the pre-fabrication facility site, which is located about 8 km outside the city. However, there will be an ambulance service and paramedic dedicated to the pre-fabrication facility.

PS3: Pollution Prevention and Abatement
During the construction phase, erosion, surface run-off, solid and liquid waste, noise and vibration, dust, vehicle and plant emissions, hazardous material (waste oil, cleaning solvents from equipment maintenance and repair) are the main sources of pollution.

*Climate, Air, Noise and Vibrations Control Program:* Impacts to air quality associated with the construction phase are mainly related to the emission of dust from the areas devoid of vegetation and from earthmovings, as well as gaseous emissions from construction equipment and trucks transporting materials and/or wastes. There is also the risk from airborne particles of cement, sand, lime, etc. all of them products from construction activities. As part of the Climate, Air, Noise and Vibrations Control Program, the following measures, among others, are in place to minimize and prevent negative impacts to air quality during construction: proper maintenance of the construction equipment, timetable for the operation of engines in order to minimize the emission sources, keeping work areas with bare soils wet, use of oxidation catalyst system which will reduce the emissions of CO2, HC and (PM10) particles, regular monitoring of environmental noise, mapping of noise sources, particulate matter (PM10), oils and greases, etc. Noise and Vibrations impacts associated with construction are due to tunneling and surface works, demolition of existing structures, road works and construction of new surfaces, and from spoil removal. Adjusting work schedules and limiting certain work activities when mitigation measures are not effective, community consultation, regular information bulletins and monitoring noise levels to respond to complaints are among the measures to be implemented.

*Water and Soils Protection Program:* The most important impacts on soils associated with the construction phase are mainly related to the loss of soil due to water erosion during the rainy season and the compaction of the soils in the area of direct influence of the Metro Line 1. These impacts are associated with the removal of the plant coverage, earthmovings, construction of access to the Metro stations, installation of temporary works, construction of road facilities, construction of underground Metro stations and in trenches.
In general, it has been considered that Best Management Practices "BMP" should be implemented, which have been accepted internationally for soil conservation in areas of urban project construction similar to the Line 1 Metro of Panama. These measures will be applied along all of the Metro’s alignment, wherever existing structures will be removed that will expose the soil, or wherever excavations will be done for road facilities and the construction of underground stations and trenches for the Metro. To minimize impacts from erosion, soil compaction and generation of sediments during construction, the following mitigation measures, among others, will be undertaken: prioritizing the start of these operations at the excavation sites for the location of the Metro’s underground stations (Fernández de Córdoba, Vía Argentina, Iglesia del Carmen, Santo Tomás, and 5 de Mayo), at trenches sites in Albrook and Transistmica Road, the track will be completed and enclosed sections stabilized with grass when possible, protect with stabilizing material those areas where soil movements or removals will be carried out during the rainy season, and to cover the areas subject to erosion with high density grass of rapid growth, as soon as possible, etc.

Measures for pollution control of soils and waters - in the case of accidental spillage on the soil surface, the pollution is transferred to the waters as these run off superficially or percolate through them toward underground waters. During construction, accidental spillage of fuels, greases and oils could impact soils and waters associated with the use of equipment and machinery. During the operations phase, the maintenance works for the equipment and machinery present a lower intensity potential for pollution. In order to mitigate these impacts, the following mitigation measures, among others, will be applied: waste management at works, temporary storage areas will be created for wastes, sewage and used lubricants, from which a final disposal will be transported to authorized sites for that purpose by responsible authorities, temporary waste reservoir sites will be placed outside the direct area of influence of the Metro, each subcontractor will be required to establish a Permanent Control Program through records of all the rolling stock, including tractors, tanks, earthmovings equipment and maintenance vehicles and transport of fuels and personnel, etc.

PS4: Community Health and Safety
All station construction sites are located in densely populated urban settlements, and measures are required to mitigate risks associated with construction equipment and vehicles to the general public. All construction sites are clearly fenced and closed to public access. Gates are controlled by armed private security guards. Odebrecht uses the same security company for its other projects in Panama. All private security companies in Panama are regulated and have to comply with national laws and regulations. The SMP has prepared traffic plans for each construction site. MIGA will require that community health, safety and security measures consistent with PS4 will be included in the operation phase management plan.

PS5: Land Acquisition and Resettlement
This project requires physical and economic displacement of about 130 businesses, but the project does not require residential relocation. All project related land has been and will be acquired by SMP. Most of the project affected businesses are micro-enterprises
and do not have free-hold titles for the land that they occupy. However, the majority of them have permits from the Panama and San Miguelito municipalities and pay fees/taxes to their respective municipalities. Land occupied by the micro-enterprises is owned by the national government. Therefore, project affected businesses are eligible for compensation for their installations and loss of livelihood during the transition period between land acquisition and business resumption in the new locations.

The SMP has developed a land acquisition framework (Strategic Plan for Compensation and Social Assistance, or PCAS for its Spanish acronym) which presents the eligibility criteria, applicable national laws and regulations, the compensation process, and the principles of land acquisition and compensation. The SMP has collected baseline information for all of the project affected businesses (including type of activity, monthly earnings, number of employees – if any, etc.) as well as an inventory of affected structures. The SMP has also started developing separate files for each business, including filled out questionnaires, baseline information, compensation amount, date of notification and relocation status.

Once the land acquisition process is initiated, each property owner is informed in writing. The evaluation of affected structures are conducted by two separate agencies (National Controller and the Ministry of Economy and Finance), both use the same appraisal methodology. Each affected business structure is compensated based on "replacement value" principle. Compensation for business installations includes construction material and labor cost at union wage level. Affected people are informed by the SMP of appraisal values. Compensation amounts can be challenged and reconsidered through a third appraisal if requested by the affected party.

To date land acquisition has affected 12 businesses, five of which have accepted the proposed relocation sites provided by the SMP; seven of the affected businesses did not accept the relocation sites, and 21 more will need to move by August 3rd, 2011. As the project is located in a densely populated urban environment it is critically important for small businesses to be close to bus stops and pedestrian traffic. Finding alternative locations with equivalent business potential is a challenge. MIGA contacted 6 of the 12 affected businesses, who clearly expressed their satisfaction with the content and clarity of information received and consultations with the SMP. They believe the amount of compensation for installations/structures is sufficient and fair. However, there have been a couple of months of delay between the acquisition of the former sites and resuming business activities at new locations, mostly due to delays in ensuring electricity and water connections and getting new permits from municipalities. For those who did not relocate to the proposed sites offered by SMP the transition period will be longer as the municipalities will need to find new locations and the businesses will need to obtain new permits. This will have an adverse impact on their livelihoods. The SMP is committed to fill these gaps by providing transition assistance and helping these small businesses with the bureaucratic process to shorten the transition period.

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2 Replacement Value: lost assets are calculated at full replacement cost, that is, the market value of building a new structure with area and quality as the same as those of the affected structure and labor.
The SMP will develop and submit to MIGA a report on already affected cases documenting: (i) compensation paid; (ii) description of consultations conducted; (iii) socio-economic baseline; (description of businesses affected and estimated monthly sales); (iv) monitoring plans; (v) description of grievance mechanism and concerns/issues raised by already relocated businesses; and (vi) description of transition assistance. For the remaining part of the r-o-w, plans for resettlement and livelihood restoration will be submitted for each segment prior to land acquisition (“liberación de vias”).

F. Environmental Permitting Process and Community Engagement

The GoP, SMP and UNDP have conducted public consultations through several means. Five sessions with focus groups of residents and business owners; 480 home surveys; and seven community meetings were organized, including a large public forum that was held on December 15, 2010. Public opinion can be summarized as follows: Panama City inhabitants acknowledge the urgent need to solve the traffic problem and support the construction of the metro. However, these surveys and public meetings also indicated that around 20% of the sample did not have sufficient information about the metro, and some of those consulted and/or included in household surveys may not have necessarily known the difference between “metro rail” and “metro bus” (which is another new initiative of GoP). Questions/concerns were also expressed with regard to cost of metro fares, indemnification, environmental impacts of the construction and operations. The SMP also conducted extensive meetings and consultations with directly affected business owners and their workers. A Community Relations Program (CRP), which is part of the proposed Environmental Management Plan has been developed to prevent and address potential social conflicts. This program includes a set of responsible and respectful social behavior practices for contractors and sub-contractors.

G. Availability of Documentation - Click underlined text below to view documents. EIA (2010), Strategic Plan for Compensation are available electronically as PDF attachments to this ESRS at www.MIGA.org.

EIA (2010) was made public before approval from the environmental authority (ANAM) and discussed during a public consultation period. The complete document, with annexes, can be found in the Metro of Panama’s website under the following address: