

Conga Project Environmental Impact Assessment (EIA)

Fact Sheet – Water

Overview

Engineering designs and management plans for Conga’s new reservoirs were developed using hydrological and other scientific studies spanning 13 years to assure downgradient communities receive the quality and quantity of water that is at least equivalent to pre-mining conditions.

Extensive Baseline Data

Data were collected for surface water and groundwater resources at numerous locations over a period of 13 years:

Data collected	Number of Monitoring Locations	Length of data collection
Conga Project area climate and weather data	2	8 years
Regional climate and weather data	13	Between 20-30 years
Monitoring of rivers and streams	28	More than 10 years
Monitoring of canals	10	More than 8 years
Initial lake studies	6 (Lagunas: Chica, Azul, Mala, Perol, Huashuas and Mamacocha)	6 years (from 1998-2004)
Lake studies – physical, chemical and biological characterization	6 (Lagunas: Chica, Azul, Mala, Perol, Huashuas and Mamacocha)	Since 2004 (ongoing)
Baseline studies for aquatic life in the rivers and lakes	15 stream 22 lake	Since 1998 (ongoing)
Seasonal monitoring of groundwater levels	96 wells varying in depth from 40 to 660 meters	Over the past 13 years
Ground water quality data	29 wells	More than 10 years

Expert Evaluations Based on International Standards

Using Peruvian and internationally certified laboratories and following international standards, evaluations included:

Hydrological and hydrogeological technical studies	Used baseline data and proven hydrology models
Surface and groundwater modeling	<ul style="list-style-type: none"> - Allowed for the evaluation of a wide range of conditions - Used in the preparation of engineering designs, impact assessments and management plans for the Project - Allowed for the comparison to other measured data to corroborate
Assessments	Included the impact of the operations and mine closure on: <ul style="list-style-type: none"> - Surface water - Ground water - Wetlands - Other environmental resources
Mitigation measures	Developed to address the above-mentioned impacts
Reviews – government agencies	The Ministry of Energy and Mines (DGAAM-MEM) approved Conga’s EIA in October 2010. The EIA also was provided to the following 12 other government agencies for review and comment: <ul style="list-style-type: none"> - Ministry of Agriculture (MINAG) - Dirección Regional de Energía y Minas de Cajamarca (DREM – Cajamarca) - Gobierno Regional de Cajamarca. - Municipalidad Provincial de Cajamarca. - Municipalidad Provincial de Celendín. - Municipalidad Distrital de La Encañada. - Municipalidad Distrital de Sorochnuco. - Municipalidad Distrital de Huasmín. - Sede de la Comunidad Campesina de Huangashanga. - Sede de la Comunidad Campesina de Sorochnuco. - Autoridad Local del Agua (ALA) - Autoridad Nacional de Agua (ANA)

Experts

Water evaluations were conducted by Peruvian and internationally recognized experts, including:

Firm	Background
Golder Associates	Founded in 1960, has 7,000 experts that operate in 160 offices worldwide, including Peru
Schlumberger Water Services (formerly Water Management Consultants)	More than 20 years of expertise in water management in Peru and throughout the world
Knight Piesold Consulting Engineers and Scientists	International consulting company with over 750 experts in offices worldwide, including Peru

Conclusions from the Studies

The extensive baseline studies and evaluations by the experts indicate the following:

Uses of surface water	Agricultural uses for crop irrigation and livestock are the predominant uses of surface water emanating from the project area.
Drinking water sources	Natural springs serve as the principal source of drinking water for the communities in the immediate vicinity of the Conga Project.
High Coliform levels	Coliform levels often exceed standards due to the presence of livestock and limited sewage management in the area.
Groundwater quality	Pre-project groundwater quality reflects the natural mineralization within the project area and exceeds some standards for metals.
Wetland degradation	Wetlands within the project area are severely degraded in many areas due to past overgrazing by livestock, and in some cases due to naturally occurring poor quality water (e.g., low pH and elevated iron). Baseline studies rated many of the wetlands as "poor" to "very poor" in terms of habitat biodiversity and ecosystem quality.
Lack of groundwater aquifers	No useable groundwater aquifers exist within the strata to be mined.
Groundwater contribution to stream flows	Groundwater accounts for approximately 3% of base flow in receiving streams. This groundwater contribution represents the low flow conditions in the streams during the dry season.
Natural lake contribution to surface water flows	Natural lakes contribute minimally to surface water flows in the vicinity of the project area, especially during the dry season. The water balance calculations assume a conservative 3% loss to groundwater, which during the dry season would report as surface water. As an example, for Perol Lake this would be equivalent to less than 3% of the current dry season flow rate.
EIA recommendations to base flow	Base flow replacements committed to in the EIA will equal or exceed current flow conditions during the dry season.

Proposal to Address Lakes – Water Storage Reservoirs

Water storage reservoirs designed to assure a year-round supply of water to downstream users will replace the four lakes to be removed by the Conga Project. The water storage reservoirs will allow for water to be released throughout the year, particularly during the dry season.

Flows from the reservoirs will be regulated by engineered outlets that provide for the controlled and safe release of water.

Reservoirs	Flow conditions
Alto Chirimayo Basin (Perol Reservoir)	Maintain base flow conditions of 7.3 liters per second (l/s) and replace Laguna Perol with a reservoir of the same 800,000 cubic meter (m ³) capacity.
Chailhuagon Basin (Chailhuagon Reservoir)	Maintain base flow conditions of 9.7 l/s and increase the existing capacity of Laguna Chailhuagon from 1,200,000 m ³ to 2,600,000 m ³ .
Alto Jadibamba Basin (Lower Reservoir)	Maintain 33.1 l/s base flow condition and replace Laguna Azul (400,000 m ³) and Laguna Chica (100,000 m ³) with a reservoir having a capacity of 1,000,000 m ³ .
Toromacho Basin	Maintain base flow conditions of 1 l/s. No natural lakes to be impacted in this basin.
Upper reservoir	Capacity of 7,600,000 m ³ will be used during operations, but will be available for community and social development use after processing ceases.

The Conga project will utilize several large sediment control structures and numerous smaller structures also will be used to protect water quality.

Sediment Control Structures	Capacity
Alto Chirimayo Basin	674,000 m ³
Chailhuagon Basin	460,000 m ³
Alto Jadibamba Basin	3,000,000 m ³
- Cofferdam to be used as a sediment control structure during construction to protect water quality and maintain base flow conditions downgradient	
Sediment Basins	Varies
- Designed to trap sediment and release water	

Contingencies involving the development of wells, installation of tanks and other effective measures will be implemented as necessary to meet the commitments to downgradient water users.