

Civil Engineer, PgDip

Expertise

Civil Engineer with more than 14 years of experience in water & environmental management, 10 of them in the Chilean mining industry. Leading Development and Operational areas in environmental, water resources, hydrogeology, fluid transportation (water, tailings & Cu concentrate), tailings storage facilities and mine dewatering. Responsible for the development of hydrogeology models for basins and open pits. Managing OPEX and CAPEX budgets over MUS\$ 25 a year.

Education

Diploma Mining Business Management, 2010, University Adolfo Ibañez
PgDip. Water & Environmental Management, 2007, University of Bristol
Civil Engineer, specialization hydraulics, sanitary & environmental, 2004, Universidad de Chile

Professional Affiliations

Professional Experience

2017 – Present	<i>Itasca S.A., Chile Water Resources Manager</i>
2015 - 2017	<i>Doña Inés Collahuasi Mining Company, Chile Water, Tailings and Concentrate Manager</i>
2013 – 2015	<i>Doña Inés Collahuasi Mining Company, Chile Water Resources Manager</i>
2010 –2013	<i>El Tesoro Mining Company, AMSA, Chile Environment & Water Superintendent</i>
2008 – 2010	<i>El Tesoro Mining Company, AMSA, Chile Head of Water Resources</i>
2005 – 2006	<i>Ifarle Engineering Consultants, Chile Projects Engineer</i>
2004 – 2005	<i>Conic - BF Civil Engineering Consultants, Chile Projects Engineer</i>
2004	<i>Aguas Andinas S.A., Chile Practicing Engineer</i>

Project Experience

Mining Hydrogeology: Has led the realization of conceptual and numerical hydrogeology models in relation with the assurance of water resources for mining operations, environmental impact assessments due to groundwater extraction and open pit dewatering. Additionally, has led monitoring initiatives of water levels and pore pressures through open wells and grouted in piezometers, generating necessary data for operational decision-making and as support in the elaboration of environmental impact assessments. Experience has been gained in El Tesoro, Collahuasi and Los Pelambres mining companies at different levels of participation.

Groundwater modelling: In addition to leading the realization of hydrogeological models for mining companies, he developed the hydrogeological conceptual model of the Valleys of Chicureo and Chamicero and later carried out the construction, calibration and realization of the numerical model and predictive simulations using the MODFLOW code. This was done for Aguas Andinas S.A., a Santiago sanitary company, as part of the Water Management Plan that was prepared to ensure sufficient water resources for the growing urban development in the area.

Water Management & Planning: Responsible for planning and water management in the El Tesoro and Collahuasi Mining Companies. In El Tesoro, led the implementation of an Early Warning Plan (EWP) that allowed securing the environmental permits for water extraction, giving continuity to the operation. This EWP consisted of the deepening of water wells to extract from a deep aquifer disconnected from surface water bodies and, at the same time, implemented a complex surface and groundwater monitoring plan. To have better long-term planning tools, it ensured the realization of a series of studies, including rainfall variations due to climate change, evaporation, recharge and water balances at operational and watershed levels. He also participated in audits of water management systems in the Los Bronces and Los Pelambres mines.

Instrumentation for groundwater monitoring & hydraulic tests for hydrogeology characterization of fractured and low permeability media: Has led processes for the implementation of surface and groundwater monitoring plans to analyze physical and chemical changes in water. Experience in telemetry implementation for remote monitoring points. He also developed monitoring plans and defined the necessary infrastructure to monitor potential impacts on aquifers caused by infiltrations from tailings deposits and leaching piles. Has supervised the performance of packer, step drawdown and variable rate tests to define hydrogeological parameters in karst and sedimentary aquifers.

Implementation of projects in mining processes: Replacement of HDPE pipes for tailings transport and coated steel for concentrate transport. As part of the responsibilities within environmental management, was responsible for the expansion of the Reverse Osmosis Plant (RO) that generated drinking and demineralized water for the processes. Led the implementation of solar energy in mining processes. Proposed and led the construction of a thermosolar plant (16 hectares and 1280 collectors) to heat solutions in the SX-EW process, which consisted of heating water with parabolic trough technology, storing it and making water - electrolyte heat transfer. Also led the construction of a Photovoltaic Concentration Plant (CPV) to supply electricity to the onsite Data Center of Cía. Minera El Tesoro.

Papers and Publications

Espinoza, C.; Tore, C.; Brown, M. Sustainable Management of groundwater for valleys of Chicureo & Chamisero. Vertiente Magazine, ALHSUD, N°10, Year 10. December 2005.