

# CRISTOBAL VARGAS DONOSO, M.Sc.

GROUNDWATER MODELER / CONSULTANT-HYDROGEOLOGY



## EDUCATION

M.Sc., Hydrogeology and Environmental Engineering, Technical University of Darmstadt, Germany, 2018

B.Eng., Civil Engineering, University of Chile, Chile, 2013

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## EXPERIENCE

### SUMMARY

Cristobal Vargas has a M.Sc. in Hydrogeology and Environmental Engineering and a B.Eng. in Civil Engineer with specialization in Hydraulic, Environmental and Sanitary Engineering. Cristobal has five years of professional and research experience in the field of groundwater modeling and joined Robertson GeoConsultants Inc. in 2019. His technical experience includes saturated and unsaturated groundwater flow modeling, solute transport modeling and reactive transport modeling. Furthermore, he has experience in the analysis of hydraulic testing and hydrological information to model the interaction between surface water and groundwater.

Cristobal is proficient in the use of the commercial numerical modeling software: GMS, Groundwater Vistas and Visual MODFLOW; geographic information system; QGIS and ArcGIS; and is experienced automatizing processes and analyses using Excel Visual Basic.

His technical experience also encompasses project management of dual rotary and diamond drilling programs, included well construction and development, and hydraulic testing.

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## PROFESSIONAL HISTORY

2019-present: Groundwater Modeler, Robertson GeoConsultants Inc.  
2017-2018: Co-op Student, Arcadis Germany GmbH  
2015-2016: Modeling Engineer, Arcadis Chile  
2013-2014: Modeling Engineer, Hidromas Ltda.

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## PROJECT EXPERIENCE

### GROUNDWATER MODELING

#### ***Las Tortolas Mill Site, Chile (2019-present) for Anglo American Chile (AACH)***

- Update the conceptual and numerical groundwater flow and transport model to assess the proposed mitigation plan for the Ex-Bosque sector
- Analyze pumping tests on monitoring and pumping wells to characterize the hydrogeological parameters from the local aquifer to support groundwater modeling

***Myra Falls Mine, Vancouver Island, Canada (2019-present) for Nyrstar***

- Post-process groundwater transport results to visualize quality data in support of groundwater modeling calibration

***Rum Jungle Mine, The Northern Territory, Australia (2019) for Department of Mines and Energy***

- Produce and extract results of the sensitivity analyses for the three transient groundwater flow and transport models which in series comprehends the complete modeling period

***La Pampa del Tamarugal, Chile (2016) for SQM***

- Update and extend the existing transient groundwater flow model
- Calibrate the groundwater flow model to assess effects of water extractions produced in the area and to identify locations of new extraction wells

***XII Region, Magallanes and Antarctica basins, Chile (2015) for DGA***

- Develop and calibrate the transient saturated groundwater flow models of Punta Arenas
- Produce the sensitivity analyses of the groundwater models of Punta Arenas, Tierra del Fuego, and Antarctica Continental Norte.

***Copiapó, III Atacama Region, Chile (2015) for Pucobre***

- Generate the surface hydrological model and estimate recharge rates for the hydrogeological model
- Develop and calibrate the transient unsaturated groundwater flow model to assess future aquifer water depletion and identify the optimal location for extraction wells

***Copiapó River's Basin Aquifer, III Atacama Region, Chile (2014) for DGA***

- Update and calibrate the transient groundwater model of the Copiapó River's Basin
- Generate scenarios to assess future groundwater extractions and their effects on the aquifer's groundwater levels and on wells used for municipal use, agricultural and mining activities

## HYDROGEOLOGICAL STUDIES

***Las Tortolas Mill Site, Chile (2019-present) for Anglo American Chile (AACH)***

- Manage dual rotary and diamond drilling programs in West and Main Dam Sectors as part of a comprehensive hydrogeological investigation to support the design and implementation of a seepage interception system and aquifer remediation
- Analyze pumping tests to characterize the local aquifers to support permitting of pumping wells

***Los Puquíos from Llamara Salt Flat, I Tarapacá Region, Chile (2015) for SQM***

- Update and improve the conceptual model of the Llamara Salt Flat based on the analysis of groundwater level and salinity
- Analyze the hydrogeological information and the effect of injection trials in the area to sustain Los Puquíos's water levels and propose an injection plan on the existing artificial recharge system

## SEDIMENT TRANSPORT

***Piga and Collacagua Rivers, Atacama Desert, I Tarapacá Region, Chile (2016) for BHP***

- Calculate the bottom and suspended sediment transport capacity in Piga and Collacagua rivers produced by extreme hydrological events

***Debris Flow in Tocopilla, Antofagasta and Taltal, II Atacama Region, Chile (2015) for DGA***

- Assess the damages produced by the debris flows through field visits and surveys from local authorities and inhabitants affected by these events
- Evaluate the status of the alluvial control works and the vulnerability of gullies that do not have control works