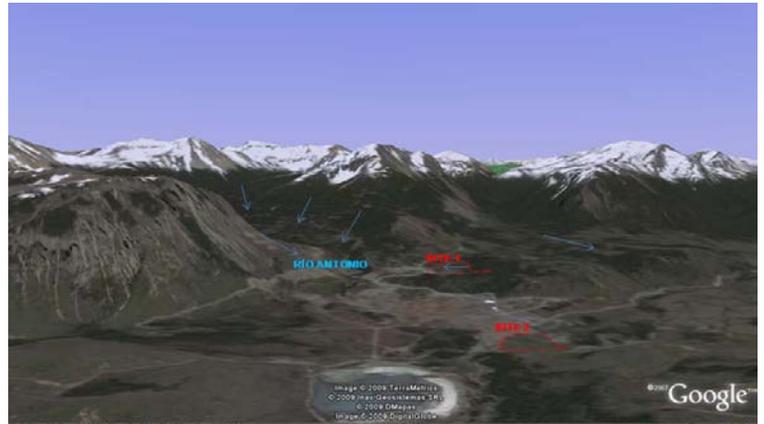


PROJECT TITLE AND LOCATION Dona Rosa Tailings Dam Dona Rosa, Chile		YEAR COMPLETED	
		PROFESSIONAL SVCS: 2008	CONSTRUCTION (IF APPLICABLE)
CLIENT'S INFORMATION			
RIZZO'S CLIENT Contractual Society Minera El Togui (SCMET)	POINT OF CONTACT NAME	POINT OF CONTACT TELEPHONE NUMBER / EMAIL (...)	

BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT

Rizzo Associates Chile S.A. (RIZZO) performed the Project of leaked Relaves Doña Rosa, due to the need to have a site to store relaves produced by the Mineral Processing Plant. RIZZO performed the geomorphologic study and determine the geotechnical characteristics of the embankment site and the deposit design.



RIZZO's Scope of Work is detailed as follows:
OBJECTIVES - To bring the general concepts and the works involved in the development of the leaked relaves deposit under study. To present the design for the materialization of the deposit based on the design ground that were agreed upon with SCMET.

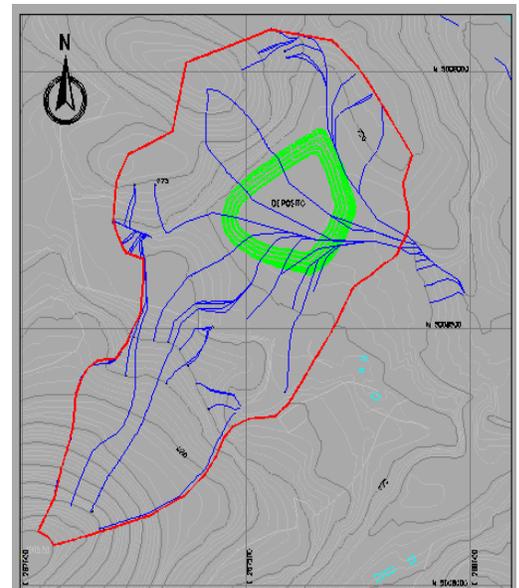
STUDY DEVELOPMENT

Geotechnics Background - They were compiled by works done in the field by RIZZO. The geotechnic campaign done consisted of drilling 5 pits, SPT tests, Field Vane Test, Lefranc, Lugeon, stratigraphic descriptions and laboratory tests. We had also geophisic tests information made at the zone. With this information, we could obtain design parameters to the engineering development.

Hydrogeologic Background – RIZZO conducted a hydrogeologic study of the zone in base of satellite images, and test pumping at the pits. It was established that the Doña Rosa Area is placed at a prominence geologic composed by overload material and ash volcanic consolidated. This prominence is surrounded by high snowed peak mountains. The aim recharge of aquifers would be placed at the snowed zone in rocks very fractured. The outflow of the underground waters to the surface of the bordering Rivers, such as San Antonio River located at Doña Rosa South Area. Like the Doña Rosa Area is a prominence, it could be a very poor recharge through the San Antonio River, being the greater period of recharge, in raining periods.

Hydrologic Background – RIZZO analyzed the topography SCMET supplied by utilizing the software Land civil 3D. It determined the basin demarcation area that affects the zone study, and therefore RIZZO determined the basin surface.

The determination of the flow was made according to the methodology and parameters proposed at the el “Manual de Cálculo de Crecida y Caudales Mínimos en Cuencas sin Información Pluviométrica DGA-1995”, elaborated for flows without pluviometric control and an Hydrogeologic regime predominant of rain type.



TEST ANYLISIS

With the background compiled and doing the corresponding analysis, it was determined the design parameters.

Analysis Test Laboratory: Based upon the laboratory results, field work and test pits, the site characteristics were determined. The results are a complement of the in situ test analysis.

Test SPT Analysis Interpretation: This analysis was made using the information compiled during the tests made in field, and whose interpretation takes into account the corrections of the tests due to the test depth.



Field Vane Test Analysis: This was done using the corrections according to the regulation ASTM D2573

Permeability Tests Results: Test permeability was done at different pits. According to the values of the measured permeability in the strates before mentioned, it could be indicated that these materials are permeable in their natural deposition condition.

WORKS DESIGN

Based upon the results of the above tests and field work, the characteristics of the site and the conditions of the leaked relaves deposits, the following tasks were deemed necessary:

- Deposit wall confinement: these walls will be constructed by two types of walls, the mail confinement wall and the secondary confinement walls
- Drainage Basal System: collection of lateral secondary drainages and drainage carpet
- Surrounding Drain: to alter the course of the superficial waters, and this contemplate works such as collecting works, less in existing beds, and a unloading of the drain at the end of the line
- Control Pond and Monitoring of effluents

STABILITY SLOPE ANALYSIS

RIZZO completed a stability analysis with the information compiled. The slop surrounded for this stability analysis is 1V:2H, and it doesn't consider the formation of water table in the material of relaves closed to the analyzed slope.

DEPOSIT CAPACITY

Based on the stability results, RIZZO made an estimation of the leaked relaves deposit capacity Doña Rosa, and the useful life associated to the maximum capacity. An eventual increase of the deposit could be obtained thus broadening the site to the south area where there are some interferentes that should be turned over, or to define a security distance before defining an expansion through that area.

