

# ALTO MAIPO SpA

CONTRACT AM-CO368

SERVICES AGREEMENT "GLACIER MONITORING ALTO MAIPO"

BETWEEN

ALTO MAIPO S.p.A.

AND

GEOTEST CHILE S.p.A.

dated

January 1<sup>st</sup>, 2016



# ALTO MAIPO SpA

AM-CO368

## SERVICES AGREEMENT "GLACIER MONITORING ALTO MAIPO"

This Services Agreement, dated as of **January 1<sup>st</sup>, 2016**, is entered into by and between **ALTO MAIPO S.p.A.**, a *sociedad por acciones* organized under the laws of the Republic of Chile ("Owner"), and **GEOTEST CHILE S.p.A.** a *sociedad por acciones* organized under the laws of the Republic of Chile, ("Consultant") (each a "Party" and collectively, the "Parties").

### WITNESSETH:

WHEREAS, Owner is developing a tunnel complex located at upper part of the Maipo river basin, and two run of the river hydroelectric power plants (collectively, the "Facilities") in connection with its Alto Maipo project (the "Project");

WHEREAS, Owner desires to engage Consultant to examine the influence of the construction activities of the Alto Maipo S.p.A. on the glacier development. It includes the glacier extents between 1990 and 2016, the correlation of the glacier development with climatic conditions and a scientific analysis of the natural glacier retreat scenarios. Additionally Consultant shall submit a further investigation. This should include the monitoring of vibrations in the glacier front areas as well as a continuation of the glacier extent mapping between 2016 until 2018. The details of services' description is indicated in Appendix A (collectively, the "Services") for the Project; and

WHEREAS, Consultant has the means, resources, highly qualified and experienced personnel and the administrative and organizational structure and is willing to provide such services for the Project upon the terms and conditions set forth in this consulting services agreement, including Sections 1 through 5 hereof and all appendices attached hereto (this "Agreement").

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants and agreements contained in this Agreement, the Parties, intending to be legally bound hereby, agree as follows:

### **1. SERVICES**

- 1.1 Scope of Services. Consultant shall perform the Services defined in Appendix A at the Project site in accordance with this Agreement. The scope of Services shall be subject to change at the request of Owner in writing and acceptance by Consultant.
- 1.2 Assignment. Consultant may not assign or transfer this Agreement or any of their rights hereunder without the prior written consent of Owner.
- 1.3 Time Schedule. Consultant shall perform the Services according the products established in Appendix A.
- 1.4 ServicesTerm. Parties agreed as starting date 1<sup>st</sup> January, 2016 and termination date 31<sup>th</sup> December, 2018.





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- 1.5 Workplace. Own offices, and other locations as is established in Annex A.
- 1.6 Deliverables. All books, records, data, emails, drawings, models, specifications, reports, plans, calculations, and other Owner's documents reviewed, prepared or acquired by Consultant in connection with the Services (the "Deliverables") shall be the exclusive property of Owner. Title to all Deliverables shall vest in Owner upon the earliest of (a) the date of payment therefore by Owner, notwithstanding any amounts withheld by Owner in accordance with this Agreement; (b) the date that such Deliverables are delivered to Owner; (c) the date of expiration of this Agreement; or (d) the date of termination of this Agreement or applicable Requests for Services. Consultant agrees that the Deliverables may be disclosed by Owner in any dispute resolution proceeding.
- 1.7 Owner Review and Approval. During the performance of the Services, Owner may require Consultant to submit certain Deliverables for Owner's review and comment. Owner's review of any such Deliverables is strictly for confirmation of apparent conformance with Owner's expectations in respect to the Services, and no examination or lack of examination by Owner of any Deliverable, nor any use of the term "acceptance" nor any comments, lack of comment or objection, rejection or other action by Owner in respect thereof shall relieve or release Consultant of its duties, obligations or liabilities in respect of the Services or result in any increased liability of Owner.
- 1.8 Document Retention. Except as otherwise authorized by Owner in writing, all Deliverables (other than those which are not of a material nature) shall be preserved by Consultant for a period of at least seven (7) years after the Term or as required by Applicable Law, whichever occurs later.
- 1.9 Witness Evidence. Consultant agrees that it will reasonably cooperate with Owner in relation to any dispute resolution proceeding involving Owner's Contractors, including without limitation by providing documents and factual witness statements and giving evidence and assistance if necessary. Reasonable costs of this cooperation will be compensated in accordance with the Agreement.
- 1.10 Standards of Care. Consultant shall perform the Services (including the preparation of all Deliverables) and its obligations under this Agreement (a) with all due skill, care, diligence, professional quality, technical accuracy, completeness and coordination, exercising the degree of prudence and foresight which would be expected from a properly skilled and experienced professional about quantification of current and future water resources; determining the effects of climate change on glaciers and evaluation of natural risks under different scenarios consultancy and all in accordance with the current standards and generally accepted good international practices and (b) in compliance with Applicable Laws and this Agreement (collectively, the "Standards of Care").
- 1.11 Relationship of Parties. The Consultant acknowledges that it is not - nor anyone employed by it - an agent, employee, representative or partner of Alto Maipo and is not capable, nor shall the Consultant hold its self out as capable, of binding Alto Maipo to any obligation or liability without the prior written consent of Alto.
- 1.12 Coordination and Cooperation. Consultant shall coordinate the Services with the respective representatives of Owner, Owner's contractors identified by Owner ("Owner's Contractors") and, at Owner's request, the independent engineer for the financing parties



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of the Project based on the communication procedures agreed between the Parties and cooperate with such persons to minimize any impact on their work. Consultant further acknowledges that the Services may be at the direction of Owner's counsel, in which case Consultant agrees that the documents relating to such Services may be protected by Owner's attorney-client privilege, the attorney work product doctrine, or other privileges and protections, to the extent Consultant is so notified by Owner's counsel in writing.

### 1.13 Subcontracts.

1.13.1 Consultant shall not subcontract any portion of the Services without prior written consent of Owner. In no case shall Owner's approval of any subcontract relieve Consultant of any of its obligations under this Agreement. Consultant shall be responsible for the acts, omissions or defaults of its subcontractors as if they were the acts, omissions or defaults of Consultant.

1.13.2 The inspection, review or approval by Owner of Consultant's subcontracts, the identity of its subcontractors or a subcontractor's services shall not (a) create any contractual relation between Owner and any such subcontractors, (b) relieve Consultant from its responsibilities to ensure its subcontractors' proper and timely performance of their obligations relating to Services, or (c) affect Owner's rights or remedies. Consultant and its subcontractors shall become joint and several responsible before the Owner due to default or partial fulfillment of the obligations of any nature under this Agreement.

### 1.14 Compliance with Laws. Consultant shall, and if applicable shall cause its subcontractors to, comply with the following (collectively "Applicable Laws"):

1.14.1 all applicable statutes, rules, regulations, codes including, without limitation, applicable elements of the monitoring of glaciers Works, issued by the International practices, and standards of the country or any state or political subdivision thereof with jurisdiction over the Services being performed or where the Services are intended to be utilized;

1.14.2 in performing its obligations under this Agreement, Consultant, its employees, agents and representatives shall comply fully with all applicable anti-corruption, anti-money laundering, anti-terrorism and economic sanction and anti-boycott laws, including without limitation, Law 20,393 on Criminal Liability for Legal Entities and the United States Foreign Corrupt Practices Act.

1.14.3 Any obligation regarding to labour, social security and/or tax issues related to its own professionals that will perform the Services: and

1.14.4 all safety rules applicable to the Services and/or any obligation according Annex C:

1.14.4.1 "Reglamento de Seguridad, Salud Ocupacional y Gestión Medio Ambiental para Empresas Contratistas de AES GENER S.A. y sus empresas filiales (version 2; 63 pages);

1.14.4.2 "Plan de Invierno del PAM" (version 1; dated April 10th, 2014; 13 pages);





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- 1.14.4.3 "Plan de Emergencia del PAM" (version 3; dated April 29th, 2014; 94 pages);
- 1.14.4.4 Annex iv with "fichas de emergencia", 17 sheets;
- 1.14.5 all rules applicable to the Services and/or any obligation regarding Annex D: "Reglamento de Relacionamiento Comunitario para Contratistas de Proyecto Alto Maipo" (20 pages)
- 1.14.6 Annex C and Annex D were sent to the Consultant by e-mail in Pdf, before to signed of the present Contract. With these acceptances Consultant declares that it has received and read the annexes; he has taken due cognizance of their respective provisions; and that for all purposes of the Contract shall comply with the provisions therein and the complementary and / or alternative provisions of corporate versions of them subsequently issued.
- 1.15 Indemnity. Consultant shall defend, indemnify, and hold harmless Owner, as well as its subsidiaries and affiliates and each of their respective officers, directors, agents, employees, and principals (partners, shareholders, members or holders of an ownership interest, as the case may be) (collectively, the "Owner Indemnitees"), from and against any and all actions, costs, claims, losses, expenses and/or damages, including attorneys' fees, arising out of or resulting from:
  - 1.15.1 any breach of Applicable Law or failure by Consultant to meet the Standards of Care in the performance of the Services and relating to (a) personal injury or death to any persons and (b) property damage to Owner's property or third party property; in either case of (a) and (b) to the extent caused by Consultant, or by anyone directly or indirectly employed or contracted by Consultant, or by anyone for whose acts Consultant may be liable; and
  - 1.15.2 the performance of the Services and relating to (a) infringement of any third-party intellectual property rights, (b) third party claims against Owner for unauthorized disclosure by Consultant of any Confidential Information, (c) non-payment of any taxes due from Consultant and (d) violation of Applicable Laws by Consultant, its employees, agents or if applicable, subcontractors, save to the extent set out in Section 1.13.1.
- 1.16 Insurance.
  - 1.16.1 Consultant shall be responsible for losses or claims set forth below which may arise out of or result from Consultant's performance or obligations to perform under the Agreement, whether such performance is by Consultant or by anyone directly or indirectly employed by Consultant, or by anyone for whose acts Consultant may be liable: (a) claims under workers' compensation (or local equivalent); (b) claims for damages for bodily injury, occupational sickness or disease, or death of Consultant's employee; (c) claims for damages insured by personal injury liability coverage; and (d) claims for damages for injury to or destruction of tangible property.



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1.16.2 Notwithstanding, Consultant shall contract an accident and own liability insurance at its expense to cover the damages or injuries described in the preceding paragraph, including any insurance required or requested by Chilean Law (Law 16.744 Occupational Accidents and Diseases, among others) or any that Consultant deems necessary to cover damages to its assets or another risks.

1.16.3 Consultant may be included as insured in the Owner's Contract Insurance Program of ALTO MAIPO ("OCIP") upon its requirement. The OCIP holds a coverage in Chile of civil liability for damages to third parties and personal accidents of Consultant and its employees according to the terms and conditions of the OCIP policy. The following is a summary of OCIP main coverages:

➤ General Civil Liability, according to provisions of the Superintendencia de Valores y Seguros de Chile ("SVS") which is the official body in charge of regulating the Chilean insurance market through the clauses CAD or POL:

- CAD 1 91 094, Company's Liability.
- CAD 1 91 092, Construction Liabilities
- CAD 1 93 852, Cross Liabilities.
- CAD 1 93 051, Employer's Liability
- CAD 1 91 090, Transport Undertaking Liabilities
- CAD 1 91 093, Owners of Real State Liabilities
- CAD 1 09 035, Motor Vehicle Liabilities
- POL 1 93 004, Mobile Machinery Liabilities.
- Moral Damage and Lost Profits

Deductible will be 10% of the loss at a minimum of USD 3,000.-

➤ Civil Liability for Vehicles and Mobile Machinery, this cover acts in excess of UF 500.-

➤ Personal Accidents, according to POL 1.92.026 of SVS with:

- Plan A (Accidental Death)
- Plan B (Total and Permanent Disability due to Accident and Dismemberment)
- Passenger Seat (until UF 1,000 per person and UF 3,000 per event)

Consultant shall be responsible at its expense for any damage or injury not covered by OCIP or happened out of Chile.

ALTO MAIPO will provide a copy of OCIP policy to Consultant as requested it.

1.17 No Liens. Consultant warrants and guarantees that all Services and Deliverables provided hereunder shall be provided free and clear of all liens, encumbrances, security interests and other similar claims on title.





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- 1.18 Intellectual and Industrial Property Rights. Consultant represents and warrants that it owns, or is licensed to use, all intellectual property necessary for the conduct of its business as currently conducted, free of all liens. Consultant shall own or have the right to use all intellectual property used in the Services and warrants that such intellectual property does not infringe, misappropriate, dilute or otherwise violate the rights of any person. Consultant shall take all reasonable actions (including executing non-disclosure or intellectual property assignment agreements with past and current employees and subcontractors and filing for statutory protections) to protect, preserve, police and maintain its intellectual property, including any thereof that is confidential in nature.

## 2. COMPENSATION

### 2.1 Fees.

- 2.1.1 As consideration for the correct, timely and complete performance of the Services and all costs incurred in connection therewith, Owner shall pay to Consultant the actual hours worked by the applicable Consultant personnel in connection with its performance of the Services using the billing rates set forth in Appendix B.
- 2.1.2 The Parties expressly state that the billing rates set forth in Appendix B are expressed on a net basis.
- 2.1.3 The Contract Price shall be paid net, without any deduction on account of any income tax or other taxes, levies like.
- 2.1.4 For accounting purposes of the Owner, the Parties are proof that the total maximum expected Contract value is USD [REDACTED]. It also expressly states that if the Consultant executes a full range of services for a lower value than previously stated, he has no right to seek or receive under any title, compensation or payment in addition to that fact, since the expected value of the contract it's just a reference number and does not represent in any way a guaranteed value to the Consultant.
- 2.1.5 Consultant warrants that the billing rates set forth in Appendix B are inclusive of salary and wage-related expenses such as sick and personal leave, overtime premiums, vacation and holiday pay, home office overtime premiums, health and retirement benefits, group life and workers' compensation insurance premiums, all taxes, charges, duties, royalties and fees required to be paid under Applicable Laws, all general and overhead expenses, profit, costs of any visas, permits, or other work entry requirements, costs of equipment and services such as laptops, cell phones, wireless internet, phone call and data plans and personal safety equipment, costs of postage, delivery and courier services and all other costs related to the employment or engagement of persons or services required to perform the Services that are not otherwise expressly stated in this Agreement as being excluded from these rates. The Parties acknowledge that the service fee described in this section 2 is a reasonable remuneration for the Services.

- 2.2 Expenses. Consultant shall pay all own expenses according Appendix B.



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- 2.3 Taxes. The Consultant pays all taxes, levies, duties and charges of any due for the work or services nature, and also will make all deductions, taxation and labor deductions provided by law and carry out any and all deductions and withholdings as required by law. The Consultant hereby agrees to indemnify and hold harmless the Owner against any and all liability related to such taxes, levies, duties, fees and legal holds.
- 2.4 Applications for Payment. Consultant shall provide detailed applications for payment to Owner according the accomplishment of each of the Milestone payment established on Annex B outlining all fees and expenses incurred pursuant to Sections 2.1 and 2.2 in a form reasonably acceptable to Owner ("Application for Payment"). Supporting documentation for Applications for Payment shall include without limitation:
- 2.4.1 a Summary Report with the services performed and Time sheet.
  - 2.4.2 reasonable and proper evidence as may be reasonably requested by Owner, showing that:
    - 2.4.2.1 the quality of all the portion of the Work authorized and completed regarding the corresponding Application for Milestone Payment is in accordance with the terms of this Agreement;
    - 2.4.2.2 all Work comprising the Milestone(s) for which payment is being requested has been fully completed and Contractor is entitled to payment in the amount of the Application for Milestone Payment;
  - 2.4.3 certificates to the effect that Contractor and each Subcontractor that has hired an employee or worker in the Country is in compliance with labor laws and social security laws;
- 2.5 Owner shall notify Consultant within five (5) business days after the date Owner receives a proper and complete Application for Payment, together with all required supporting documentation, whether such Application for Payment is accepted or rejected (in whole or in part) and the reason for rejection, if applicable. Once the cause for rejection of any fee amount is resolved, the agreed amount may be included in the Application for Payment.
- 2.6 Invoices. After Consultant's receipt of Owner's acceptance of any part of an Application for Payment, Consultant shall submit to Owner an invoice in such format as Owner may reasonably require for that part of the amount of such Application for Payment that was accepted by Owner (each, an "Invoice"); provided, that not more than one (1) Invoice may be submitted by Consultant in any calendar month. Monthly Applications for Payments and Invoices shall be submitted to:
- Alto Maipo SpA  
Rosario Norte 532, Piso 19  
Las Condes, Santiago, Chile  
Attention: Ms Rosa Cipitria C. / Ms Susana Ramirez A.
- 2.7 Currency. Consultant shall present Invoices in Chilean pesos (CLP\$).





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2.8 Payment. Owner shall pay Consultant within thirty 30 calendar days of the receipt of a proper invoice if no dispute exists regarding the invoice. The Parties shall have good faith discussions to resolve any disputes regarding the invoice. If any amount of the invoice is disputed by Owner, Owner shall pay the undisputed amount of the invoice in accordance with this Agreement.

2.9 Adjustment of Rates. The billing rates set forth in Appendix B.

### 3. CONFIDENTIALITY

3.1 Confidential Information. Consultant shall keep confidential and not disclose any and all information furnished to it by or on behalf of Owner Owner's Contractors or its shareholders, board members, directors, managers, officers, employees, agents or advisors regarding the Services and/or the properties, employees, finances, businesses, operations, assets, prospects and financial affairs of Owner, Owner's Contractors or their affiliates and any other information or documentation, whether written, oral or in electronic form or on magnetic or other media that Consultant receives, has access to as a result of the performance of the Services or may learn, observe or otherwise obtain or develop concerning the business and affairs of Owner ("Confidential Information"), except for information that (a) is available to the public (other than as a result of a disclosure by Consultant), (b) was available to Consultant on a non-confidential basis prior to its disclosure by Owner, (c) becomes available to Consultant on a non-confidential basis from a person who is not bound by a confidentiality agreement with Owner or otherwise prohibited from transferring such Confidential Information to Consultant or (d) Owner agrees in writing may be disclosed. Consultant shall maintain the confidentiality of all Confidential Information utilizing safeguards and a standard of care at least as stringent as used by Consultant to preserve the confidentiality of its own confidential information. Consultant hereby agrees that it will use the Confidential Information solely for the purpose of performing the Services pursuant to this Agreement.

All Confidential Information relating to the Services that Owner has provided are proprietary to Owner. Such information has been developed at Owner's expense and contains Owner's trade secrets.

3.2 Legally Required Disclosure. In the event that Consultant is requested or required by judicial, legislative or regulatory process to disclose any Confidential Information, Consultant will provide Owner with prompt written notice of any such request or requirement so that Owner may seek, with Consultant's cooperation, an appropriate protective order or other appropriate remedy and/or waive compliance with the terms of this Agreement. In the event that such protective order or other remedy is not obtained, or that Owner waives compliance with the terms hereof, Consultant may disclose only that portion of the Confidential Information which is legally required, and Consultant shall exercise reasonable efforts to obtain assurance that confidential treatment will be accorded to such Confidential Information.

3.3 Attorney-Client Privilege. Notwithstanding anything to the contrary in this Agreement, Consultant shall not disclose any information that may be protected by Company's attorney-client privilege, attorney work product, or other privilege or protection, without the express written consent of Company.



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## 4. DISPUTE RESOLUTION AND GOVERNING LAW

- 4.1 Governing Law. This agreement shall be governed by and construed in accordance with the Laws of Chile.
- 4.2 Arbitration. Unless otherwise stated in the Contract, any difficulty, conflict or litigation that may arise between the Parties due to or in relation to this Contract, whether regarding its validity, interpretation, application, resolution, implementation, fulfillment, non-performance or other matters over which the Parties have not come to an agreement shall be submitted to a one-time resolution by a mixed arbitrator who shall be an arbitrator ex aequo et bono with respect to the procedure and an arbitrator in law with respect to the award, hence the Parties waive any remedies they may have available against such resolution.
- 4.3 The arbitrator shall be appointed by the Parties on mutual agreement and in the absence of such an agreement within 30 calendar days from the arbitration request by either Party, the arbitrator shall be appointed by the Chamber of Commerce of Santiago A.G. among the arbitration body members of the Arbitration and Mediation Center upon the request of either Party. To that end, the Parties hereby grant an irrevocable special power of attorney to the Chamber of Commerce of Santiago A.G., for it to appoint a mixed arbitrator among the arbitration body members of the Arbitration and Mediation Center upon the request of either Party. Before the Chamber appoints the arbitrator, each of the Parties shall have the right to veto up to five of the above-mentioned arbitration body members without expressing a cause.
- 4.4 Expenses resulting from the arbitrator's fees, any required technical consultancies and any other expenses incurred as a result of the arbitration shall be borne by the parties in litigation, in accordance with the respective resolution issued by the arbitrator regarding payment of the arbitration costs.
- 4.5 The Parties hereby expressly waive any and all remedies, except for the complaint remedy, and also waive the exercise of objections provided for by sections 4 and 5 in article 358 of the Civil Code.
- 4.6 The arbitrator is especially empowered to solve any matters related to its competence and/or jurisdiction. The arbitration shall take place in the city of Santiago and shall be conducted in Spanish. The Parties hereby extend in advance the maximum arbitration period to two years.

## 5. GENERAL PROVISIONS

- 5.1 Authorized Representatives. Each Party shall appoint one or more individuals who shall have the authority to administer this Agreement on behalf of the Party ("Authorized Representative") and notify the other Party in writing of such Authorized Representative and any changes thereto, as promptly as practicable.
- 5.2 Non-Exclusive Arrangement. Consultant acknowledges and agrees that this Agreement does not provide for an exclusive arrangement for the provision of Services and that Owner is entitled at any time without violating any term or condition of this Agreement to procure similar services from any third party.





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- 5.3 Conflicts of Interest. Consultant shall not perform, or enter into any agreement to perform, services for any other person, corporation or entity, except with the prior written consent of Owner, if the performance of the Services could result in a conflict with Consultant's obligations under this Agreement.
- 5.4 Term. This Agreement shall become effective on the date above first written, and shall expire on **December 31th, 2018**, subject to prior termination as set forth in Section 5.6 below.
- 5.5 Early Termination. Owner may terminate this Agreement (fully or partially) at any time for any reason and without any continuing obligation or liability to Consultant (except for any compensation earned and documented expenses incurred by Consultant prior to the date of such termination), effective upon 30 days advance written notice with such purpose. Consultant may terminate this agreement, effective upon 30 days advance written notice with such purpose, giving reasonable cause.
- 5.6 Consequential Damages. Each party to this Agreement waives, to the fullest extent permitted by law, any right it may have to receive damages from any other party based on any theory of liability for any special, indirect, consequential (including lost profits), exemplary or punitive damages.
- 5.7 Notices. All notices and other communications provided for hereunder shall be in writing and shall be deemed duly given when sent by (a) facsimile or email of documents in PDF format, in each case, with originals to follow by personal delivery within three (3) business days or (b) international overnight courier. All notices shall be delivered to the Parties at their respective address(es) or number(s) shown below or to such other address(es) or number(s) as a Party may designate by prior written notice given to the other Party in accordance with this provision:

If to Owner:

ALTO MAIPO SPA  
Rosario Norte 532, Piso 19  
Las Condes, Santiago, Chile

Attention: Jerónimo Verdugo



If to Consultant:

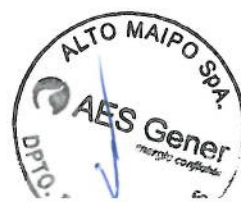
GEOTEST SpA  
La Concepción 191  
Providencia, Santiago, Chile

Attention: Georg Heim



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- 5.8 Severability. If any provision of this Agreement is held invalid or unenforceable by any court of competent jurisdiction, the other provisions of this Agreement will remain in full force and effect. Any provision of this Agreement held invalid or unenforceable only in part or degree will remain in full force and effect to the extent not held invalid or unenforceable.
- 5.9 Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the Parties and their successors and permitted assigns. Consultant shall not assign this Agreement, or any portion hereof, without the prior written consent of Owner.
- 5.10 Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which shall constitute one and the same instrument.
- 5.11 Entire Agreement. This Agreement together with all requests for Services issued hereunder constitutes the entire agreement between the Parties relating to the subject matter hereof and supersedes all prior understandings and agreements, whether oral or in writing, regarding the subject matter of this Agreement.
- 5.12 Inconsistencies. In the event of any conflict between Sections 1 through 5 of this Agreement and any of the appendices hereto, the terms and provisions of Sections 1 through 5 of this Agreement shall control.
- 5.13 Amendments and Waiver. Any provision of this Agreement may be amended if, but only if, such amendment is in writing and is signed by both Parties. Any provision may be waived if, but only if, such waiver is in writing and is signed by or on behalf of the Party waiving such provision.
- 5.14 No Third Party Rights. This Agreement is solely for the benefit of the Parties and shall not be deemed to confer upon any third party any remedy, claim of liability or reimbursement, cause of action or other right.
- 5.15 No Strict Construction: Each of the Parties, acknowledge that this Agreement has been prepared jointly by the Parties hereto and shall not be strictly construed against any Party to this Agreement.







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IN WITNESS WHEREOF, the Parties have executed this Agreement as of the day and year first written above.

### ALTO MAIPO SPA (Owner)

By:   
Name: **Andres Cabello B.**  
Title: **Legal Representative**

### GEOTEST SPA (Consultant)

By:   
Name: **Georg Heim**  
Title: **Attorney in Fact**



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## APPENDIX A

### SCOPE OF SERVICES

1. **General objective:** Examine the influence of the construction activities of the Alto Maipo S.p.A. on the glacier development. It includes the glacier extents between 1990 and 2016, the correlation of the glacier development with climatic conditions and a scientific analysis of the natural glacier retreat scenarios. Additionally Consultant shall submit a further investigation. This should include the monitoring of vibrations in the glacier front areas as well as a continuation of the glacier extent mapping between 2016 until 2018.  
The parties declare that the referred Services are mainly driven by personal professional advisory, which prevails over the use of capital (e.g. equipment or such)
2. **Specific objectives:**
  - 2.1. Section A: glacier monitoring for the catchment areas Cajón del Morado, Monumento Natural el Morado, Cajón Rubillas and Cajón el Yeso
  - 2.2. Section B: monitoring of vibrations in the glacier

#### **2.1. Section A: Scope**

Alto Maipo SpA requested GEOTEST glacier monitoring for the catchment areas Cajón del Morado, Monumento Natural el Morado, Cajón Rubillas and Cajón el Yeso (Figure 1). Following questions are to be examined:

- ✓ Which changes in the extension of the glaciers and rock glaciers can be observed during the accomplishment of the project?
- ✓ Are there causal relationships between the glacier alteration and the construction works of the project Alto Maipo?
- ✓ Does the operation of the hydroelectric power plant affect the glacier- and rock glacier development in the future?

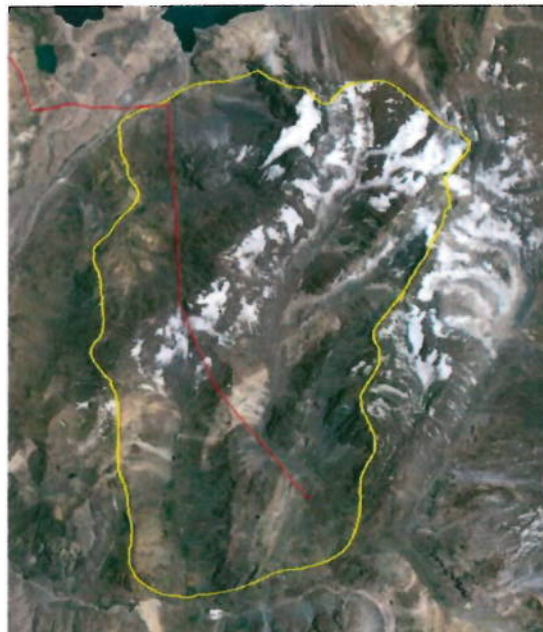


Figure 1: Future course of the tunnel (red) and studyarea for glacier monitoring (yellow).



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Consists of 3 work modules which are describes below. The glacier department of the Dirección General de Aguas (DGA) does not prescribe any minimum requirements of a glaciers monitoring. The method described below is therefore based on international standards and the monitoring plan in execution for glacier and permafrost by CODELCO Mina Andina. The procedural concept constitutes a minimal approach for a glacier monitoring. With the proposed procedure it can sufficiently examined if there exist causal relationships between the glacier retreat or rock glacier alterations and PHAM. Alto Maipo SpA is already realizing a vibration monitoring campaign to check relations between tunnel drilling and spontaneous glaciär ruptures.

### **Module 1a: Alteration of extension of glaciers and rock glaciers without reference areas**

In a first step glaciers (white and debris covered) and rock glaciers will be detected on the basis of very high resolution satellite imagery. By means of recent (including aerial fotos from 2016) and historical image analysis (different time periods since 1945), alterations in extension and surface can be determined for different points of time by the use of geographical information systems (Figure 2). The examination will be carried out for the study area (Figure 1).

The results of the extent delimitation of the glaciers for the current status (2015/2016) will be selectively verified by means of site inspections.

### **Module 1b: Alteration of extension of glaciers and rock glaciers of reference areas**

The examination described in Module 1a will be carried out for the two reference areas (Echaurren and Mesoncito glaciers). In particular the nearby glacier Echaurren ranks among the most investigated glaciers of Southamerica. In terms of loca-tion, size and orientation, these glaciers are well-suitable as reference areas. We assume to get the delimitations of the Echaurren glacier from the Dirección Gen-eral de Agua (DGA) without additional costs.

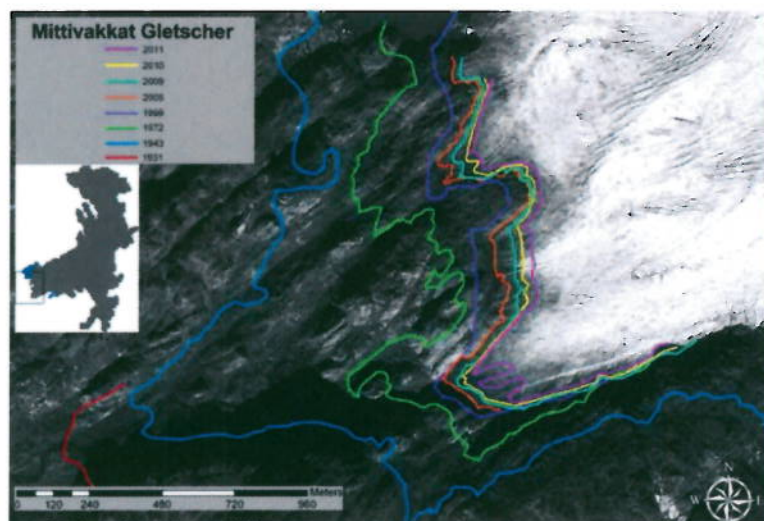


Figure 2: Overlay of manually digitized different glacier extents for the Mittivakkat glacier in Greenland. Source: Digital Globe.

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### **Module 2: Correlation of surface alteration and climate data**

Glaciers are indicators for the climate. They respond quickly to changes in atmospheric conditions. In the context of climate change and global warming a worldwide retreat of glaciers can be observed. The above-average annual temperatures and very low precipitation during the last two years may have led to an increased glacier retreat. However, the above-average retreats since 2014 can be prematurely associated by the population and project opponents with the construction works of PHAM. For this reason we recommend to correlate the results of surface alterations (Module 1) with the general atmospheric conditions, including measurements of winter precipitation, summer temperatures, radiation datas available from nearby meteostations. The study includes the influences of atmospheric phenomenas like El Niño.

### **Module 3: Qualitative description of the glaciers development based on scientific findings and literature studies**

The development of glaciers and rockglaciers (retrospectively and prospectively) can be explained by complex interactions of climate parameters (temperature, precipitation, radiation), relief, location and natural sediment delivery.

In module 3, the extensive development under consideration of these correlations will be explained and, in doing so, a scientific qualitative description of the influence of possible artificial sediment cover due to construction works will be provided. As a further result a forecast of the glacier development and the future impact of the project will be estimated. Additionally, we will realize a literatur study of the glaciers within the perimeter indicated in figure 1, coordinating with the World Glacier Monitoring System (Switzer-land with projects in Chile) and other institutions working in Chile like the DGA. The literature study can specify the individual natural behavior of the glaciers within the area. It also considers possibles structure failures described in literatures or in old imagery datas.

### **Underlying data base**

1. Aerial Image Trimetrogon from 1945 (organized and paid by Consultant)
2. Very high resolution imagery between 1990 and 2015, captured in summer months (organized and paid by Consultant)
3. Aerial imagery from overfly in february 2016 (organized and paid by Contractor).
4. Climate data of nearby meteostations (organized and paid by Consultant)

### **Data provision by Alto Maipo**

The data aquisition is accomplished by the Consultant. Acquisition costs are included in the offer.

The generation of the aerial imagery for the whole polygon in figure 1 for February 2016 will be organized and financed by the Consultant.

### **Products**

**Products phase 1:** Visualization of the status of the glaciers and rock glaciers be-tween 1990 and 2015. Data will be handed as attributed ESRI-shapefile and pdf.

**Products phase 2:** Diagramm representation of the correlation of surface alteration and the temperature and precipitation.

**Products phase 3:** The findings will be presented in a technical report.





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Technical Report: Methods and results will be described in detail in the course of a technical report (english).

### 2.2. Section B: Scope

Alto Maipo SpA requested GEOTEST to additionally submit a further investigation proposal. This should include the monitoring of vibrations in the glacier front areas as well as a continuation of the glacier extent mapping between 2016 until 2018. The following questions are to be examined:

- ✓ Which changes in the extension of the glaciers and rock glaciers can be observed during the future accomplishment of the project (2016 – 2018)?
- ✓ Are there causal relationships between the glacier alteration and the construction works of the project Alto Maipo?
- ✓ Does the operation of the hydroelectric power plant affect the glacier- and rock glacier development until 2018?
- ✓ Does the blasting during tunneling between El Volcán and El Yeso cause glacier instabilities?

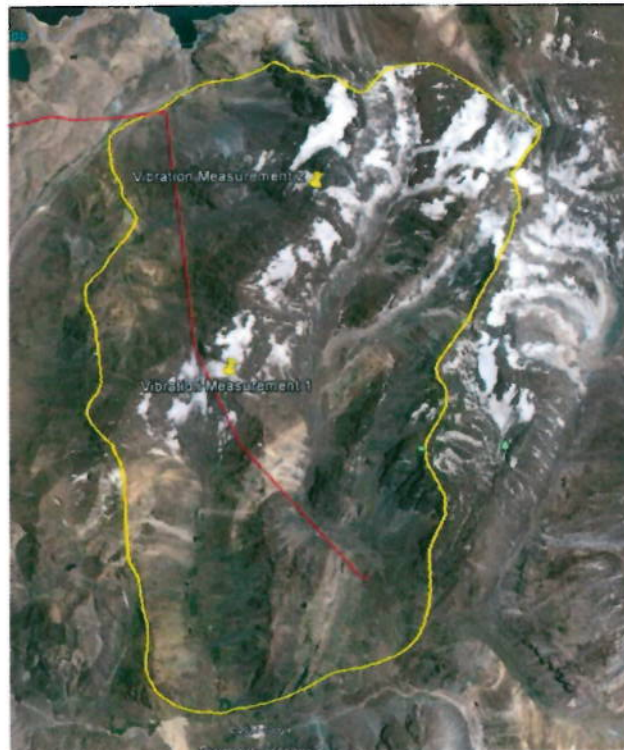


Figure 1: Future course of the tunnel (red) and study area for glacier monitoring (yellow). Possible locations for the vibration measurements are highlighted in yellow.

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Consists of three work modules which are described below. The glacier department as well as the environment department of the Dirección General de Aguas (DGA) does not prescribe any minimum requirements of a glaciers monitoring. The method described below is therefore based on international standards and the monitoring plan in execution for glacier and permafrost by CODELCO Mina Andina. With the proposed procedure it can be sufficiently examined if there exist causal relationships between the glacier retreat, rock glacier alterations and PHAM for the time-period until 2018.

### **Module 1: Alteration of extension of glaciers and rock glaciers from 2016 to 2018**

In a first step glaciers (white and debris covered) and rock glaciers will be detected on the basis of satellite images in the years 2016, 2017 and 2018. By means of geographical information systems, alterations in extension and surface during the project works until 2018 can be determined (Figure 2). The examination will be carried out for the study area (Figure 1) as well as for two reference areas (Echaurren and Mesoncito glaciers). In particular the nearby glacier Echaurren ranks among the most investigated glaciers of Southamerica. In terms of location, size and orientation, these glaciers are well-suitable as reference areas. We assume to get the delimitations of the Echaurren glacier from the Dirección General de Agua (DGA) without additional costs.

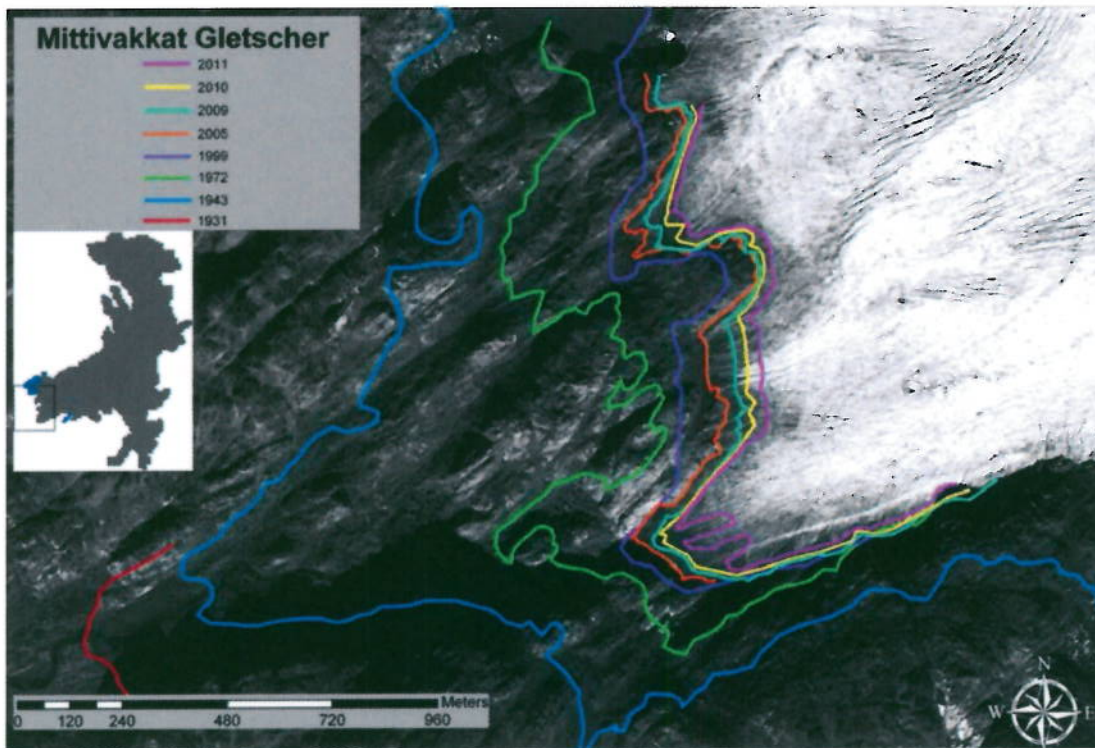


Figure 2: Overlay of manually digitized different glacier extents for the Mittivakkat glacier in Greenland.  
Source: Digital Globe.

The results will be related and fitted into the earlier elaborated time series (Offer GE-OTEST No. 4015024.1b) in order to interpret possible alterations. The extent delimitation of the glaciers will be selectively verified by means of site inspections.





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Glaciers are indicators for the climate. They respond quickly to changes in atmospheric conditions. In dry warm conditions until 2018 the glaciers may melt unusually quickly. Without a correlation of melting rates with meteorological conditions, the population may associate the surfaces alterations with the construction activities of Alto Maipo SpA. By means of the mentioned correlation the actual reasons behind the glacier retreat can be determined.

### Module 2: Measurement of Vibration

In summer 2015, a sudden local failure was observed at the front of the glacier Meson Alto. Alto Maipo SpA would like to clarify whether there exist a correlation between the glacier instability and the tunnelling. We recommend to perform permanent vibration measurements between 2016 and 2018 at two representative sites (glacier front area along the tunnel axis). The records can be correlated with running vibrations protocols in the tunnel.

The measurements are accomplished by means of customary vibration measuring de-vices (MR30001). The power supply is guaranteed by solar panels. The two autonomous systems are manufactured and tested in Switzerland and delivered to Chile. The installation equipment (solar panel) are obtained and mounted in Chile.

### Carta Gantt

Following services are provided:

	2016				2017				2018				
	Jan	Feb	Mar	Apr	Feb	Mar	Apr	Feb	Mar	Apr	May		
<b>Meetings</b>													
Start of project	x												
Work meeting			x	x	x	x	x	x	x	x	x		
Final meeting												x	
<b>Alteration of Glacier extension</b>													
Acquiring Satellite imagery and interpretation					x			x					
Analysis of (rock) Glacier alteration (digitalization), incl. Ref.areas						x	x		x	x			
Verification in terrain						x	x		x	x			
Back group Mountain guide						x	x		x	x			
Correlation analysis extension/meteo data							x			x			
Report with foto documentation							x					x	
<b>Measurement of vibration</b>													
preparation and calibration	x												
Shipment to Chili	x	x											
Installation		x											
Data retrieval february, march, april 2016		x	x	x									
Function tests of equipment		x			x			x					
Monthly Blasting Protocol (delivering to GEOTEST)		xx	xx	xx	xx	xx	xx	xx	xx	xx	xx		
correlation tunneling and glacier instabilities				x			x				x		
Report with foto documentation (draft and final report)				x			x					x	

Figure 3: Carta Gantt with work items, time schedule and responsibilities. Acquisition of 2016 satellit imagery is part of the GEOTEST offer No. 4015024.1b. Yellow blocks: Data will be send by Alto Maipo to GEOTEST.



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Figure 4: Example measuring station of GEOTEST/GEOPRAEVENT with autonomous power supply (solar panel, Plaine Morte glacier).

### Underlying data base

- ✓ Aerial imagery from overfly in summer 2017 and 2018 (organized and paid by Consultant)
- ✓ Climate data of nearby meteostations (organized and paid by Consultant)

### Tasks to be accomplished by Alto Maipo

**Module 2:** Blasting protocols in the tunnels: Monthly Transfer of blasting protocols to GEOTEST from february 2016 to april 2018.

### Products

**Products module 1:** Visualization of the status of the glaciers and rock glaciers between 2016 and 2018. Data will be handed as attributed ESRI-shapefile and pdf. Diagramm representation of the correlation of surface alteration and the temperature and precipitation.

**Products module 2:** Diagramm representation of the correlation between blasting during tunnelling, earthquakes and vibrations measurements in the area of the glacier tongue. Interpretation of the impacts of the tunnelling on the glacier stability.

Technical Report: Methods and results will be described in detail within 4 work step reports and 1 final technical report (english).

### **2.3. Section C: Scope**

Unforeseen additional investments for the glacier monitoring due to the obligatory Safety Induction and medical checks.



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## APPENDIX B

### BILLING RATES

Billing Rates: (American Dollars)

#### Section A of Scope

N°	Item	USD
1	Preparations, Project coordination, project meetings (3 meetings)	
2	Costs data acquisition and preparation (excluding drone flight 2016)	
3	Acquiring and processing of Aerial imagery february 2016 (Orthofotos, relative referencing)	
4	Module 1a including proportion of technical report	
5	Module 1b including proportion of technical report (only in combination with Module 1a)	
6	Module 2 including proportion of technical report	
7	Module 3 including proportion of technical report	
8	Travel expenses	
9	Total USD	

#### Section B of Scope

N°	Item	USD
1	Preparations, Project coordination, project meetings (5 meetings in 2016 and 2018)	
2	Order and preparation of aerial fotos 2017 and 2018	
3	Module 1 including proportion of technical report	
4	Module 2 including proportion of technical report (incl. helicopter flights)	
5	Total USD	

#### Section C of Scope

Desciption	Unit	Unit Price (CLP\$)	Quantity	Total Amount
Georg Heim	day	927.000	3,00	
Lukas Rohrbach	day	783.000	3,00	
Anne Schauss	day	296.000	3,00	
Medical check (app)	day	200.000	3,00	
Total CLP				
Total USD				
t/c CLP\$ x 1 USD\$				696,19

#### Total Amount

N°	Item	USD
1	Scope A	
2	Scope B	
3	Scope C	
4	Total USD (Net)	

