



CERTIFICATE OF ACCREDITATION

This is to attest that

CENTRO DE ECOLOGÍA APLICADA S.A.

LABORATORIO AMBIENTAL
LOS HILANDEROS 8733, LA REINA
SANTIAGO 7880031, REPUBLIC OF CHILE

Inspection Agency AA-815 (Type A)

has met the requirements of AC98, *IAS Accreditation Criteria for Inspection Agencies*, and has demonstrated compliance with ISO/IEC Standard 17020:2012, *Conformity assessment - Requirements for the operation of various types of bodies performing inspection*. This organization is accredited to provide the services specified in the scope of accreditation.

Expiry Date December 1, 2024
Effective Date November 27, 2023



A handwritten signature in black ink, reading 'Raj Nathan'.

President

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SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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CENTRO DE ECOLOGÍA APLICADA S.A.

www.cea.cl

Contact Name Manuel Contreras

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Accredited to ISO/IEC 17020:2012

Effective Date November 27, 2023

Field and Range of Inspection	Regulations, Inspection Methods, Standards and/or Specifications
Sampling of Surface water, groundwater, sea water	DI-101 version 2 based on NCh ISO 5667/1:2017; NCh ISO 5667/4:2016; NCh ISO 5667/6:2015; NCh 411/3:2014; NCh 411/9:1997; NCh 411/11:2022; NCh 411/12:2018 and NCh 411/19:2017
Sampling water for industrial purposes	DI-128 version 1 based on NCh ISO 5667/1:2017, 411/3:2014 and NCh411/10:2005
Sampling of wastewater	NCh411/10.Of2005. Parte 10. Wastewater sampling - Collection and handling of samples
Sampling of drinking water, source of drinking water and sources catchment,	DI-129 versión 1 based on NCh ISO 5667/1:2017, NCh 411/3:2014 and NCh 409/2:2004
Sampling of Aquatic sediments, lake sediments and marine sediments	DI-101 version 2 based on NCh ISO 5667/1:2017; NCh ISO 5667/4:2016; NCh ISO 5667/6:2015; NCh 411/3:2014; NCh 411/9:1997; NCh 411/11:2022; NCh 411/12:2018 and NCh 411/19:2017
Sampling of Aquatic organisms in continental ecosystems	DI-102 version 1 based on Fisheries and Aquaculture Research Fund (2018) Methodological guide and sampling protocols for aquatic flora and fauna in Chilean inland waters. Fishing and Aquaculture Undersecretary (Fipa No. 2016-46)
Sampling of Aquatic organisms in marine ecosystems	DI-111 version 1 based on INVEMAR – Institute for Marine and Coastal Research (2012) Manual of marine and coastal ecosystem methods with a view to establishing environmental impacts. Institute of Marine and Coastal Research "José Benito Vives de Andreis" and National Hydrocarbons Agency ANH. Colombia
Sampling of Soil	DI-112 version 1 based on NCh 3400/1: 2016; NCh 3400/2: 2016.
Measurement of Dissolved Oxygen in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 4500-O G
Measurement of Oxygen Saturation in Surface Water, Groundwater, Seawater, drinking water,	DI-105 version 3, based on measuring equipment

AA-815

Centro de Ecología Aplicada S.A.



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Field and Range of Inspection	Regulations, Inspection Methods, Standards and/or Specifications
source of drinking water, sources catchment, wastewater and water for industrial purposes	manuals
Measurement of Conductivity in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 2510 B
Measurement of Salinity in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	DI-105 version 3, based on measuring equipment manuals
Measurement of pH in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 4500-H+ B
Measurement of pH in wastewater	NCh2313/1:2021 Waste water - Methods of analysis - Part 1: Determination of pH
Measurement of Temperature in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 2550 B
Measurement of Temperature in wastewater	NCh2313/2. Of.95 Waste water - Methods of analysis. Part 2: Determination of temperature
Measurement of Turbidity of Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	DI-105 version 3 based on measuring equipment manuals
Measurement of True and Apparent Color in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 2120 B Visual comparison Method
Measurement of Free Chlorine and Total Chlorine (residual chlorine) in Surface Water, Groundwater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	ISO 7393-2: 2017. Water quality: Determination of free chlorine and total chlorine, Part 2: Colorimetric method using N, N-dialkyl-1,4- phenylenediamine, for routine control purposes
Measurement of Redox Potential in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	SM - APHA/AWWA/WEF, 24th Edition, 2023. 2580 B
Measurement of Redox Potential in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	US EPA Region 4 (2017) Field Measurement of Oxidation-Reduction Potential (ORP). SESDPROC-113-R2

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Field and Range of Inspection	Regulations, Inspection Methods, Standards and/or Specifications
Measurement of Phreatic Level in Groundwater, sources catchment and water for industrial purposes	DI-123 version 2 based on ASTM D4750-87 (2001)
Measurement of Water Level in Surface Water, sources catchment and water for industrial purposes	DI-124 version 2 based on GTOS (2009)
Measurement of Flow Rate in Surface Channel	DI-125 version 1 based on ASTM D4409-95 (2014) and ISO748:2007
Measurement of Currents in Seawater	DI-125 version 1 based on ASTM D4409-95 (2014) and ISO748:2007
Measurement of Flow in Surface Water	DI-120 version 1, based on NCh 3205-2011
Measurement of Flow in Wastewater	NCh411/10.Of 2005. Part 10. Wastewater sampling - Collection and handling of samples.
Measurement of Total Suspended Solids in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	DI-105 version 3 based on measuring equipment manuals
Measurement of Total Dissolved Solids in Surface Water, Groundwater, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	DI-105 version 3 based on measuring equipment manuals
Measurement of Conductivity in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Temperature in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Dissolved Oxygen in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of pH in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Redox Potential in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Oxygen Saturation in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Salinity in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Chlorophyll a in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Turbidity in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O
Measurement of Photosynthetic Active Radiation in Surface Water and Seawater	DI-121 version 1 based on measuring equipment manuals. CTD-O

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Field and Range of Inspection	Regulations, Inspection Methods, Standards and/or Specifications
Measurement of Water Transparency (Secchi disc) in Surface Water, Seawater, drinking water, source of drinking water, sources catchment, wastewater and water for industrial purposes	ISO 7027-2: 2019. Water quality: Determination of turbidity, Part 2: Semi-quantitative methods for the assessment of transparency of waters
Measurement of pH in Aquatic Sediments (river, estuary). Lake Sediments, Marine Sediments	DI-109 version 1 based on Res. Ex. No. 3612/2009 SERNAPESCA - Numeral 28 and the modifications indicated in Res. Ex. No. 660/2018 and Res. Ex. No. 3002/2018 of the Undersecretary of Fisheries and Aquaculture
Measurement of Temperature in Aquatic Sediments (river, estuary), Lake Sediments, Marine Sediments	DI-109 version 1 based on Res. Ex. No. 3612/2009 SERNAPESCA - Numeral 28 and the modifications indicated in Res. Ex. No. 660/2018 and Res. Ex. No. 3002/2018 of the Undersecretary of Fisheries and Aquaculture
Measurement of Redox Potential of Aquatic Sediments (river, estuary), Lake Sediments, Marine Sediments	DI-109 version 1 based on Res. Ex. No. 3612/2009 SERNAPESCA - Numeral 28 and the modifications indicated in Res. Ex. No. 660/2018 and Res. Ex. No. 3002/2018 of the Undersecretary of Fisheries and Aquaculture
Measurement of pH in Soil	DI-117 version 1 based on USDA (1999) Guidelines for soil quality and health assessment
Measurement of Conductivity in Soil	DI-118 version 1 based on USDA (1999) Guidelines for soil quality and health assessment
Measurement of Temperature in Soil	DI-118 version 1 based on USDA (1999) Guidelines for soil quality and health assessment
Measurement of Conductivity in Soil	DI-127 version 1 based on measuring equipment manuals
Measurement of Temperature in Soil	DI-127 version 1 based on measuring equipment manuals
Measurement of Water Content in Soil	DI-127 version 1 based on measuring equipment manuals
Identification and Determination of Macroalgae in Marine Ecosystems	DI-111 version 1, based on INVEMAR – Institute for Marine and Coastal Research (2012) Manual of Marine and Coastal Ecosystem Methods with a View to Establishing Environmental Impacts. Institute of Marine and Coastal Research "José Benito Vives de Andreis" and National Hydrocarbons Agency ANH. Colombia.
Identification and Determination of Macrophytes in Continental Aquatic Ecosystems	DI-102 version 1, based on Fisheries and Aquaculture Research Fund (2018) Methodological Guide and Sampling Protocols for Aquatic Flora and Fauna in Chilean Inland Waters. Fishing and Aquaculture Undersecretary (Fipa No. 2016-46)
Identification, Determination and Measurement of Ichthyofauna (fish) in Continental Aquatic Ecosystems	DI-102 version 1, based on Fisheries and Aquaculture Research Fund (2018) Methodological Guide and Sampling Protocols for Aquatic Flora and

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Field and Range of Inspection	Regulations, Inspection Methods, Standards and/or Specifications
	Fauna in Chilean Inland Waters. Fishing and Aquaculture Undersecretary (Fipa No. 2016-46)
Identification, Determination and Measurement of Ichthyofauna (fish) in Marine Ecosystems	DI-111 version 1, based on INVEMAR – Institute for Marine and Coastal Research (2012) Manual of Marine and Coastal Ecosystem Methods with a View to Establishing Environmental Impacts. Institute of Marine and Coastal Research "José Benito Vives de Andreis" and National Hydrocarbons Agency ANH. Colombia.