

ANEXO B: ANTECEDENTES  
ACOMPAÑANTES ACCIONES PDC

Anexo B.1 Extracto de registros de disposición final de residuos e inicio de  
operación depósitos N°6 y 8

PLANILLA DE CONTROL DE DISPOSICIÓN DE RESIDUOS DEPOSITO DE SEGURIDAD N°6 Y DISPOSICIÓN EXTERNA

| FECHA      | CONTABILIZADOR     | LUGAR DE ACOPIO | CONTENEDOR     |        |          |        |    |    |          |          |      | OBSERVACION | SIDREP ASOCIADO | DETALLE |
|------------|--------------------|-----------------|----------------|--------|----------|--------|----|----|----------|----------|------|-------------|-----------------|---------|
|            |                    |                 | TAMBOR 200 LTS | TP 200 | TP 60-80 | Pallet | Ti | Pq | MAXISACO | BINS 1M3 | OTRO |             |                 |         |
| 13-03-2015 | Francisco Larrondo | CANCHA N° 1     |                |        |          |        |    |    | 13       |          |      |             |                 |         |
| 13-03-2015 | Francisco Larrondo | CANCHA N° 1     |                |        |          |        |    |    | 21       |          |      |             |                 |         |
| 16-03-2015 | Francisco Larrondo | CANCHA N° 1     |                |        |          |        |    |    | 15       |          |      |             |                 |         |
| 17-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    | 11       |          |      |             |                 |         |
| 17-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    | 2        |          |      |             |                 |         |
| 17-03-2015 | Francisco Larrondo | CANCHA N° 1     |                |        |          |        |    |    | 4        |          |      |             |                 |         |
| 18-03-2015 | Francisco Larrondo | CANCHA N° 2     | 21             |        |          |        |    |    |          |          |      |             |                 |         |
| 18-03-2015 | Francisco Larrondo | CANCHA N° 2     | 23             |        |          |        |    |    |          |          |      |             |                 |         |
| 19-03-2015 | Francisco Larrondo | CANCHA N° 2     | 15             |        |          |        |    |    |          |          |      |             |                 |         |
| 19-03-2015 | Francisco Larrondo | CANCHA N° 2     | 2              |        |          |        |    |    | 6        |          |      |             |                 |         |
| 19-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    |          |          | 15   |             |                 |         |
| 19-03-2015 | Francisco Larrondo | CANCHA N° 1     |                |        |          |        |    |    | 15       |          |      |             |                 |         |
| 20-03-2015 | Francisco Larrondo | CANCHA N° 1     | 40             |        |          |        |    |    |          | 1        |      |             |                 |         |
| 20-03-2015 | Francisco Larrondo | CANCHA N° 2     | 40             |        |          |        |    |    |          |          |      |             |                 |         |
| 20-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    | 10       |          |      |             |                 |         |
| 23-03-2015 | Francisco Larrondo | CANCHA N° 1     | 110            |        |          |        |    |    |          | 1        |      |             |                 |         |
| 23-03-2015 | Francisco Larrondo | CANCHA N° 1     | 40             |        |          |        |    |    |          |          |      |             |                 |         |
| 23-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    | 8        |          |      |             |                 |         |
| 24-03-2015 | Francisco Larrondo | CANCHA N° 1     | 48             |        |          |        |    |    |          |          |      |             |                 |         |
| 24-03-2015 | Francisco Larrondo | CANCHA N° 2     |                |        |          |        |    |    | 5        |          |      |             |                 |         |
| 07-04-2015 | Francisco Larrondo | CANCHA N° 2     | 68             |        |          |        |    |    |          | 12       |      |             |                 |         |
| 07-04-2015 | Francisco Larrondo | CANCHA N° 2     | 32             |        |          |        |    |    |          |          |      |             |                 |         |
| 07-04-2015 | Francisco Larrondo | CANCHA N° 1     | 42             |        |          |        |    |    |          |          |      |             |                 |         |
| 08-04-2015 | Francisco Larrondo | CANCHA N° 2     | 10             |        |          |        |    |    |          |          |      |             |                 |         |
| 08-04-2015 | Francisco Larrondo | CANCHA N° 2     | 21             |        |          |        |    |    |          |          |      |             |                 |         |
| 08-04-2015 | Francisco Larrondo | CANCHA N° 2     | 10             |        |          |        |    |    |          |          |      |             |                 |         |



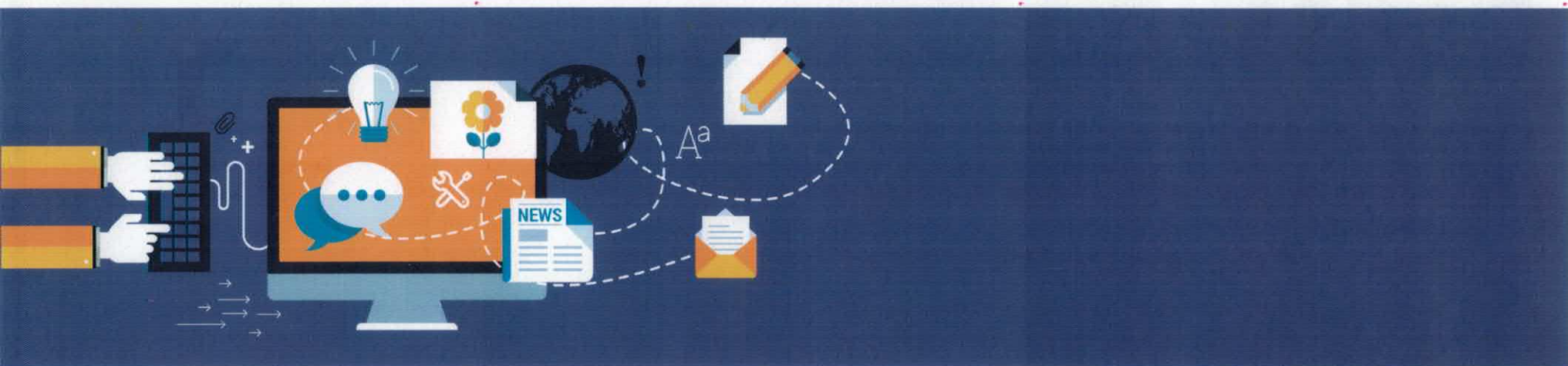
**PLANILLA DE CONTROL DE DISPOSICIÓN DE RESIDUOS DEPOSITO DE SEGURIDAD N°8 Y DISPOSICIÓN EXTERNA**

| FECHA      | CONTABILIZADOR     | LUGAR DE ACOPIO | CONTENEDOR     |        |          |        |    |    |          |          |        | OBSERVACION | SIDREP ASOCIADO | DETALLE |
|------------|--------------------|-----------------|----------------|--------|----------|--------|----|----|----------|----------|--------|-------------|-----------------|---------|
|            |                    |                 | TAMBOR 200 LTS | TP 200 | TP 60-80 | Pallet | TI | Pq | MAXISACO | BINS 1M3 | OTRO   |             |                 |         |
| 12-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 31       |          |        |             |                 |         |
| 18-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 29       |          |        |             |                 |         |
| 18-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 34       |          |        |             |                 |         |
| 18-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        | 5        |        |    |    |          |          |        |             |                 |         |
| 19-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 14       |          |        |             |                 |         |
| 19-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 25       |          |        |             |                 |         |
| 20-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 30       |          |        |             |                 |         |
| 20-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 14       |          |        |             |                 |         |
| 20-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 5        |          |        |             |                 |         |
| 26-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 34             |        |          |        |    |    |          | 1        |        |             |                 |         |
| 26-12-2017 | Jesús Galleguillos | CANCHA N° 1     |                |        |          |        |    |    |          |          | 14.320 |             |                 |         |
| 26-12-2017 | Jesús Galleguillos | CANCHA N° 1     |                |        |          |        |    |    |          |          | 17.520 |             |                 |         |
| 26-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    |          |          | 25.790 |             |                 |         |
| 27-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 31       |          |        |             |                 |         |
| 27-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 28       |          |        |             |                 |         |
| 27-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 32       |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 80             |        |          |        |    |    |          |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 1              |        |          | 1      |    |    |          |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 2              |        |          |        |    |    |          |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 80             |        |          |        |    |    |          |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     | 41             |        |          |        |    |    | 4        |          |        |             |                 |         |
| 28-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    | 30       |          |        |             |                 |         |
| 29-12-2017 | Jesús Galleguillos | CANCHA N° 2     |                |        |          |        |    |    |          |          | 25.450 |             |                 |         |
| 29-12-2017 | Jesús Galleguillos | DISP. DIRECTA   |                |        |          |        |    |    |          |          | 26.990 |             |                 |         |
| 02-01-2018 | Jesús Galleguillos | CANCHA N° 2     | 80             |        |          |        |    |    |          |          |        |             |                 |         |





Anexo B.2 Tutorial uso Link.



**Acceso Plataforma para descargar archivos de clientes**

<http://confinorsa.cl/acceso/>

Ejemplo:

Usuario: webmanager

Clave: f2k4PEyGkHnRJVUm

## Página de Inicio



Nombre de usuario o correo electrónico

Contraseña



Mantenerme conectado

Entrar

[¿Has olvidado tu contraseña?](#)

### DIRECCIÓN:

Camino C-404 KM. 795, Ruta 5  
Región de Atacama

### TELÉFONOS:

+56 2 7528116 / +56 9 79762417

### VISÍTENOS:

[www.confinorsa.cl](http://www.confinorsa.cl)

## Ingresa a Descargar Archivos



[Descargar Archivos](#)

[Mi cuenta](#)

[Cerrar sesión](#)

Usuario

Tú estás aquí: Inicio / Usuario



Empresa

WebManager



pdf.pdf





**Para registrar a un nuevo cliente importante que no se debe estar "logeado"**

<http://confinorsa.cl/acceso/registro/>

1. Se ingresan los datos

2. Se cierra sesión para entrar como administrador

The image shows a web registration form for CONFINOR. An orange arrow points from the text '1. Se ingresan los datos' to the registration form fields. Another orange arrow points from the text '2. Se cierra sesión para entrar como administrador' to the 'Cerrar sesión' button in the top right corner.

**CONFINOR**

Descargar Archivos   Mi cuenta   **Cerrar sesión**

Registro

Tú estás aquí: Inicio / Registro

Empresa

Nombre

Apellidos

Dirección de email

Nombre de usuario

Contraseña

Confirmar Password

**Registro**

**DIRECCIÓN:**  
Camino C-404 KM. 795, Ruta 5  
Región de Atacama

**TELÉFONOS:**  
+56 2 7528116 / +56 9 79762417

**VISÍTENOS:**  
[www.confinorsa.cl](http://www.confinorsa.cl)

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## Entrar como administrador

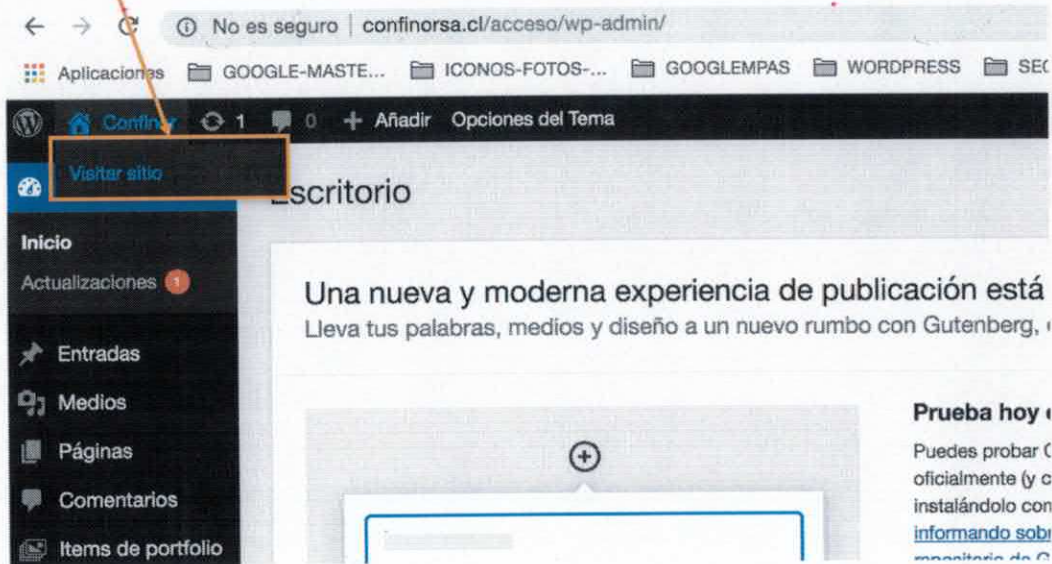
<http://confinorsa.cl/acceso/accesowp>

Usuario: xxxxxxxxxxxxxxxx

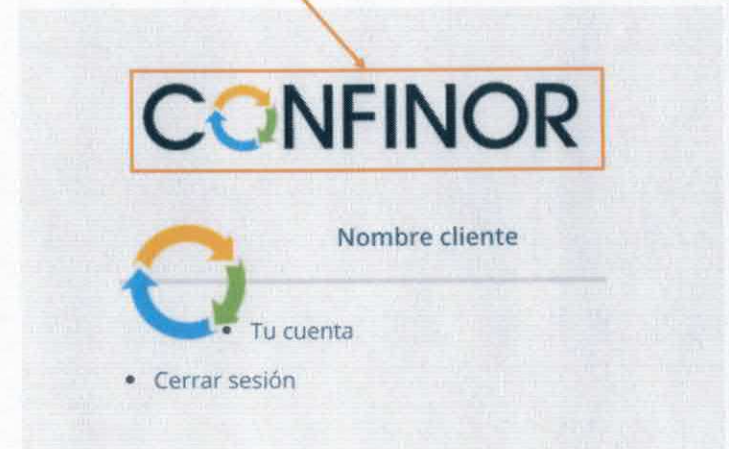
Clave: xxxxxxxxxxxxxxxx



## 1. Entrar aquí



## 2. Hacer click aquí





### 3. Clic en “Miembros” para subir archivos a cada cliente

CONFINOR

Descargar Archivos

Mi cuenta

Cerrar sesión

Miembros

Usuario

Tú estás aquí: Inicio / Usuario



Empresa

Administrador

### 3. Clic en "Editar Perfil"

NOTA:

Acá estarán todos los "clientes".

Esta página sólo la ve el administrador y solo él puede subir o eliminar archivos.

# CONFINOR

Miembros

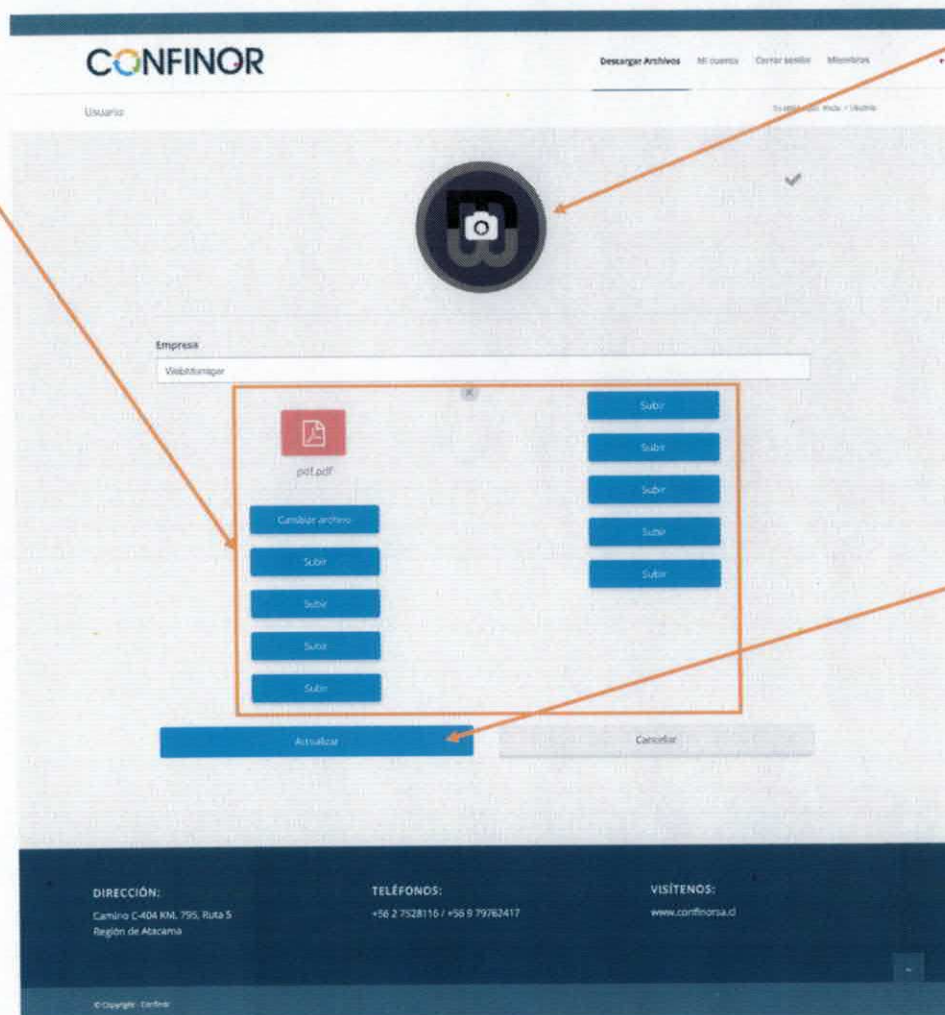


WebManager

⚙ Editar perfil

4. Se pueden subir o eliminar archivos

5. Se pueden subir un logo o una imagen

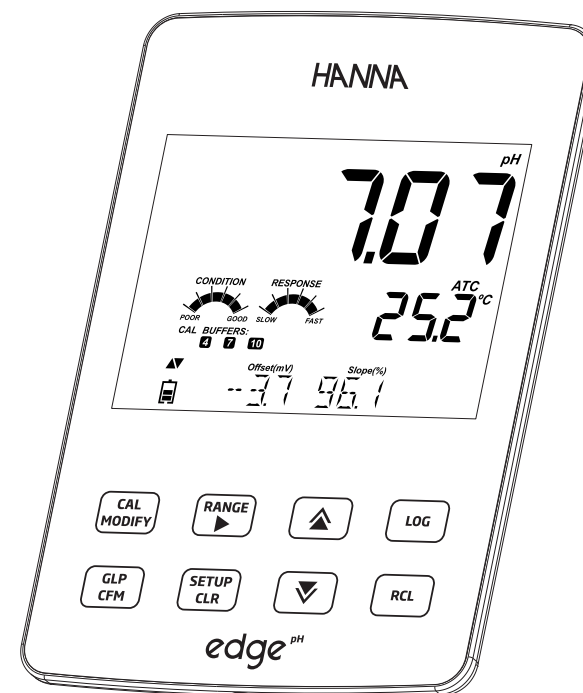


6. Actualizar

### Anexo B.3: Características Técnicas equipos medición de pH.

# edge<sup>®</sup>

pH



MANEDGEPH 12/14

Hanna Instruments reserves the right to modify the design, construction or appearance of its products without advance notice.

**HANNA<sup>®</sup>**  
instruments

Dear  
Customer

Thank you for choosing a Hanna Instruments product.

Please read this instruction manual carefully before using this instrument. This manual will provide you with the necessary information for correct use of this instrument, as well as a precise idea of its versatility.

If you need additional technical information, do not hesitate to e-mail us at [tech@hannainst.com](mailto:tech@hannainst.com) or view our worldwide contact list for a Hanna representative near you at [www.hannainst.com](http://www.hannainst.com).

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**edge<sup>PH</sup>®** is guaranteed for two years against defects in workmanship and materials when used for its intended purpose and maintained according to instructions. Electrodes and probes are guaranteed for six months. This warranty is limited to repair or replacement free of charge. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered. If service is required, contact your local Hanna Office. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packed for complete protection.

Warranty

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## Accessories

|                                               |                                                                                       |
|-----------------------------------------------|---------------------------------------------------------------------------------------|
| HI 8061L                                      | General Cleaning Solution in FDA approved bottle, 500 mL                              |
| HI 8073L                                      | Protein Cleaning Solution in FDA approved bottle, 500 mL                              |
| HI 8077L                                      | Oil & Fat Cleaning Solution in FDA approved bottle, 500 mL                            |
| <b>ELECTRODE REFILL ELECTROLYTE SOLUTIONS</b> |                                                                                       |
| HI 7082                                       | 3.5M KCl Electrolyte, 4x30 mL, for double junction electrodes                         |
| HI 8082                                       | 3.5M KCl Electrolyte in FDA approved bottle, 4x30 mL, for double junction electrodes. |
| <b>ORP STANDARD SOLUTIONS</b>                 |                                                                                       |
| HI 7021L                                      | ORP Test Solution 240mV @ 25 °C/ 77 °F, 500 mL                                        |
| HI 7021M                                      | ORP Test Solution 240mV @ 25 °C/ 77 °F, 230 mL                                        |
| HI 7022L                                      | ORP Test Solution 470mV @ 25 °C/ 77 °F, 500 mL                                        |
| HI 7022M                                      | ORP Test Solution 470mV @ 25 °C/ 77 °F, 230 mL                                        |
| <b>ORP PRETREATMENT SOLUTIONS</b>             |                                                                                       |
| HI 7091L                                      | Reducing Pretreatment Solution, 500 mL                                                |
| HI 7091M                                      | Reducing Pretreatment Solution, 230 mL                                                |
| HI 7092L                                      | Pretreatment oxidizing solution, 500 mL                                               |
| HI 7092M                                      | Pretreatment oxidizing solution, 230 mL                                               |
| <b>Other Accessories</b>                      |                                                                                       |
| HI 75110/220U                                 | Voltage adapter from 115 Vac to 5 Vdc (USA plug)                                      |
| HI 75110/220E                                 | Voltage adapter from 230 Vac to 5 Vdc (European plug)                                 |
| HI 76404B                                     | Electrode holder                                                                      |
| HI 2000WC                                     | Wall cradle                                                                           |
| HI 2000BC                                     | Bench cradle                                                                          |
| HI 920015                                     | Micro USB cable                                                                       |

Remove the instrument & accessories from the packaging and verify damage has not occurred during shipping. Remove protective film from meter. Notify your nearest Hanna Customer Service Center if damage is observed.

Each instrument is supplied with:  
edge<sup>pH</sup>® (**HI 2002**)  
Bench cradle  
Wall cradle  
Electrode holder  
USB cable  
5 Vdc Power Adapter  
Instruction Manual  
Quality Certificate

**HI 11310:** Digital pH Electrode with integrated temperature sensor

pH 4.01, 7.01 & 10.01 Buffer Sachets

HI 700601 General Purpose Cleaning Solution

**Note:** Save all packing material until you are sure that the instrument works correctly. Any defective item must be returned in its original packing.

Before using this product, make sure that it is entirely suitable for your specific application and for the environment in which it is used.

Operation of this instrument may cause interference to other electronic equipment, requiring the operator to take steps to correct interference. Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.

To avoid damages or burns, do not put the instrument in microwave ovens. For your and the instrument's safety, do not use or store the instrument in hazardous environments.

## Included

## Safety Measures

Description

edge<sup>pH</sup>® enables the user to make fast, accurate measurements of commonly measured laboratory parameters using the Hanna edge<sup>pH</sup>® digital sensors for pH. Each digital sensors has a unique serial numbe. Once connected to the meter, the sensor(s) are ready to measure their parameter along with temperature.

The user interface permits you to adapt edge<sup>pH</sup>® to your exact measurement requirements. The intuitive design simplifies configuration, calibration, measurement, data logging and transfer of data to a USB thumb drive or computer. edge<sup>pH</sup>® also offers a basic operation mode that streamlines measurement configuration and is useful for many routine applications. (Every feature and measurement detail is designed to give you an edge in measurement technology.)

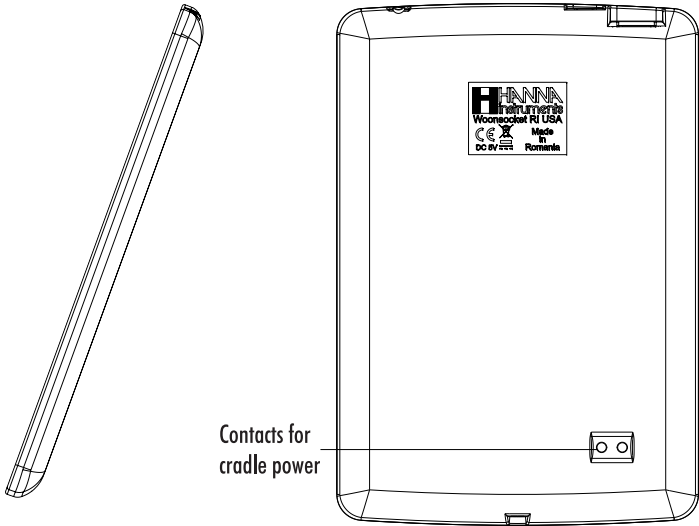
edge<sup>pH</sup>® is versatile in many ways. The slim meter and probe can be used as a portable device (using its rechargeable battery) or used in its bench or wall cradles (that also power the meter) as a line-powered laboratory instrument.

Diagram

Product  
Diagram

- Sleek, clean, intuitive design
- Internal clock and date
- Adjustable resolution
- Auto parameter recognition
- Dedicated GLP key
- GLP data included with logged data
- Basic mode for simplified operation
- Simplified data transfer to a PC
- Up to 8 hour battery life when used as a portable device

Side & Back  
View



Electrodes/Probes

|          |                                                                                                                               |
|----------|-------------------------------------------------------------------------------------------------------------------------------|
| HI 10530 | Triple ceramic, single junction, low temperature glass, refillable pH electrode with conical tip and temperature sensor       |
| HI 10430 | Single ceramic, double junction, high temperature glass, refillable pH electrode with temperature sensor                      |
| HI 11310 | Glass body, double junction, refillable pH/temperature electrode                                                              |
| HI 11311 | Glass body, double junction, refillable pH/temperature electrode with enhanced diagnostics                                    |
| HI 12300 | Plastic body, double junction, gel filled, non refillable pH/temperature electrode                                            |
| HI 12301 | Plastic body, double junction, gel filled, non refillable pH/temperature electrode with enhanced diagnostics                  |
| HI 10480 | Glass body, double junction with temperature sensor for wine analysis                                                         |
| FC 2320  | Double junction, open reference, non refillable, electrolyte viscolene, PVDF body with conical tip, pH/temperature electrode  |
| FC 2100  | Double junction, open reference, non refillable, electrolyte viscolene, glass body with conical tip, pH/temperature electrode |
| FC 2020  | Double junction, open reference, non refillable, electrolyte viscolene, PVDF body with conical tip, pH/temperature electrode  |
| HI 36180 | Glass body, double junction, refillable ORP/temperature probe                                                                 |
| HI 36200 | Plastic body, single junction gel filled, non refillable ORP/temperature probe                                                |

pH

Buffer Solutions

|           |                                                         |
|-----------|---------------------------------------------------------|
| HI 70004P | pH 4.01 Buffer Sachets, 20 mL (25 pcs.)                 |
| HI 70007P | pH 7.01 Buffer Sachets, 20 mL (25 pcs.)                 |
| HI 70010P | pH 10.01 Buffer Sachets, 20 mL (25 pcs.)                |
| HI 7001L  | pH 1.68 Buffer Solution, 500 mL                         |
| HI 7004L  | pH 4.01 Buffer Solution, 500 mL                         |
| HI 7006L  | pH 6.86 Buffer Solution, 500 mL                         |
| HI 7007L  | pH 7.01 Buffer Solution, 500 mL                         |
| HI 7009L  | pH 9.18 Buffer Solution, 500 mL                         |
| HI 7010L  | pH 10.01 Buffer Solution, 500 mL                        |
| HI 8004L  | pH 4.01 Buffer Solution in FDA approved bottle, 500 mL  |
| HI 8006L  | pH 6.86 Buffer Solution in FDA approved bottle, 500 mL  |
| HI 8007L  | pH 7.01 Buffer Solution in FDA approved bottle, 500 mL  |
| HI 8009L  | pH 9.18 Buffer Solution in FDA approved bottle, 500 mL  |
| HI 8010L  | pH 10.01 Buffer Solution in FDA approved bottle, 500 mL |

ELECTRODE STORAGE SOLUTIONS

|           |                                                 |
|-----------|-------------------------------------------------|
| HI 70300L | Storage Solution, 500 mL                        |
| HI 80300L | Storage Solution in FDA approved bottle, 500 mL |

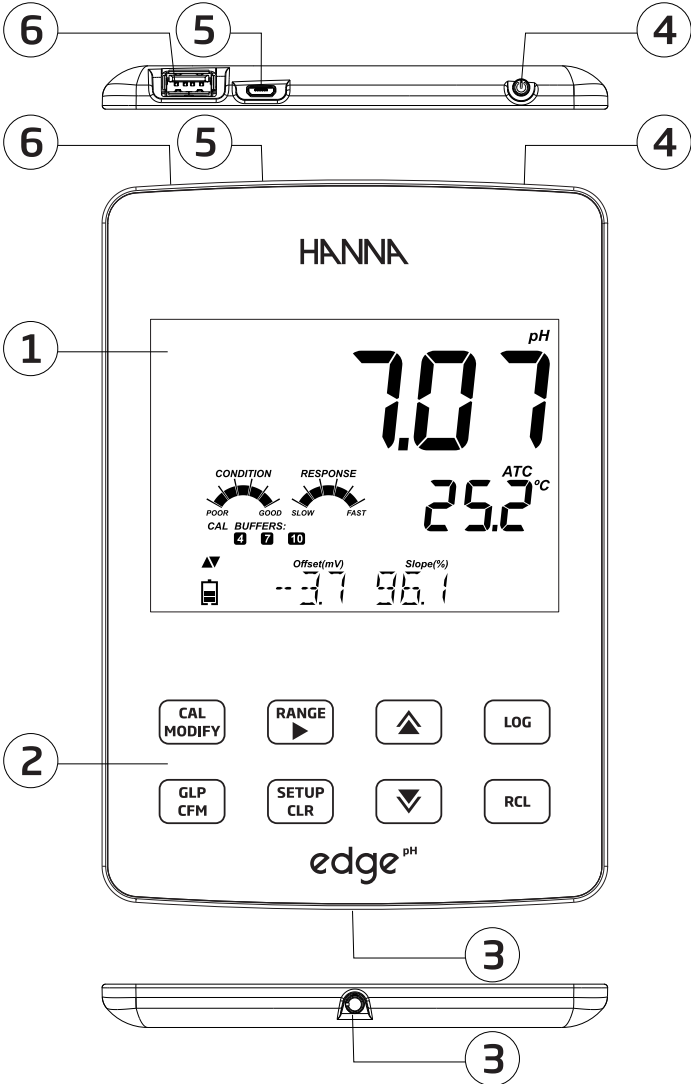
ELECTRODE CLEANING SOLUTIONS

|           |                                          |
|-----------|------------------------------------------|
| HI 70000P | Electrode Rinse Sachets, 20 mL (25 pcs.) |
| HI 7061L  | General Cleaning Solution, 500 mL        |
| HI 7073L  | Protein Cleaning Solution, 500 mL        |
| HI 7074L  | Inorganic Cleaning Solution, 500 mL      |
| HI 7077L  | Oil & Fat Cleaning Solution, 500 mL      |

Accessories

|                             | pH, mV in pH, mV in ORP                                                                                                                                                    | Temperature                           |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Range                       | -2.00 to 16.00 pH<br>-2.000 to 16.000 pH*<br>±1000.0 mV in pH<br>±2000.0 mV in ORP                                                                                         | -20.0 to 120.0 °C; -4.0 to 248.0 °F** |
| Resolution                  | 0.01 pH<br>0.001 pH*<br>0.1 mV in pH<br>0.1 mV in ORP                                                                                                                      | 0.1 °C; 0.1 °F                        |
| Accuracy<br>@ 25 °C / 77 °F | ±0.01pH<br>±0.002 pH*<br>±0.2 mV in pH<br>±0.2 mV in ORP (±999.9 mV)<br>±1 mV in ORP (±2000 mV)                                                                            | ±0.5 °C; ±0.9 °F                      |
| pH Calibration              | Automatic, up to 3 points (5 points*) calibration, 5 standard (7 standard*) buffers available (1.68*, 4.01 or 3.00, 6.86, 7.01, 9.18, 10.01, 12.45*) and 2 custom buffers* |                                       |
| Relative mV Calibration     | Single point calibration                                                                                                                                                   |                                       |
| Temperature compensation    | Automatic -5 to 100° C (23 to 212° F) (using integral temperature sensor)                                                                                                  |                                       |
| Log feature                 | Up to 1000* records organized in:<br>Log on demand (Max. 200 logs)<br>Log on stability (Max. 200 logs)<br>Interval logging*                                                |                                       |
| Additional Specifications   |                                                                                                                                                                            |                                       |
| PC Interface                | Micro USB                                                                                                                                                                  |                                       |
| Storage Interface           | USB                                                                                                                                                                        |                                       |
| Power Supply                | 5 VDC Adapter (included)                                                                                                                                                   |                                       |
| Environment                 | 0-50 °C (32-122 °F) Max 95% RH non-condensing                                                                                                                              |                                       |
| Dimensions                  | 202 x 140 x 12 mm (7.9 x 5.5 x 0.5")                                                                                                                                       |                                       |
| Weight                      | 250g (8.82 oz)                                                                                                                                                             |                                       |
| pH Electrode                | HI 11310 Intelligent pH/temperature electrode (included)                                                                                                                   |                                       |

\*Standard Mode Only  
\*\* pH and temperature will be reduced to actual probe/sensor limits.



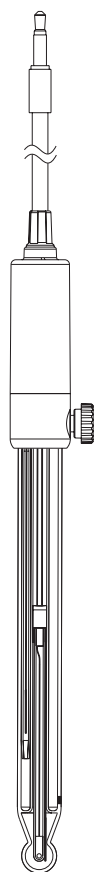
1. Liquid Crystal Display (LCD)

2. Capacitive Touch Keypad

3. 3 mm jack input for edge<sup>pH</sup>® digital probes

4. Top mounted ON/OFF button
5. Micro USB device connection for power or PC interface

6. Standard USB host connection for data transfer to a USB thumb-drive



pH Electrode

- Probes process signal directly for noise free measurements
- Auto sensor recognition
- Store calibration specific data from the last calibration
- Are built with materials suitable for use in chemical analysis
- Have integrated temperature measurement
- Incorporate a 3 mm jack termination
- Unique serial ID in every probe for traceability

After performing any of the cleaning procedures, rinse the electrode thoroughly with distilled water, and refill the reference chamber with fresh electrolyte (not necessary for gel-filled electrodes) and soak the electrode in HI 70300 or HI 80300 Storage Solution for at least 1 hour before taking measurements.

#### Temperature dependence for ORP sensors

The oxidation-reduction potential (ORP) displayed in mV, is the voltage that results from the difference in potential between the platinum metal surface and the Ag/AgCl reference electrode. ORP values are not temperature compensated, although ORP mV can change with temperature (e.g. reference electrode potential changes and sample equilibrium changes). It is important to report ORP values together with the reference electrode used and the temperature of measurement.

| Symptoms                                                                        | Problems                                                                        | Solution                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No sensor connection.                                                           | Sensor model not recognized.                                                    | Make certain, 3 mm connector is in all the way by pushing firmly into probe input.                                                                                                                           |
| Slow response/excessive drift.                                                  | Dirty pH electrode.                                                             | Clean the electrode and then soak the tip in HI 7061 or HI 8061 for 30 minutes.                                                                                                                              |
| Readings fluctuate up and down (noise).                                         | pH: Clogged/dirty junction. Low electrolyte level (refillable electrodes only). | Clean the electrode. Refill with fresh solution (for refillable electrodes only). Check cable and connectors.                                                                                                |
| The meter does not accept the buffer/standard solution for calibration.         | pH: Dirty electrode or contaminated buffer.                                     | Follow the cleaning procedure. If still no results, replace the electrode. Replace buffer.                                                                                                                   |
| If the display shows: "pH" and "-2.00" or "16.00" blinking.                     | Out of range in the pH scale.                                                   | A) Verify that the shipping cap has been removed.<br>B) Make sure the pH sample is in the specified range.<br>C) Check electrolyte level and general state of the electrode.                                 |
| If the display shows: "mV" and "-1000" or "1000" blinking.                      | Out of range in the mV scale.                                                   | A) Verify the shipping cap has been removed.<br>B) Make sure the sample pH is within specified range.<br>C) Verify electrolyte level in pH sensor is topped off.<br>D) Verify no bubbles inside pH membrane. |
| The meter does not measure temperature. "----" is displayed on second LCD line. | Broken temperature sensor.                                                      | Replace the probe.                                                                                                                                                                                           |
| The meter fails to calibrate or gives faulty readings.                          | Broken pH electrode.                                                            | Replace the electrode.                                                                                                                                                                                       |
| At startup the meter displays all LCD tags permanently.                         | One of the keys is stuck.                                                       | Check the keyboard or contact your local Hanna Office.                                                                                                                                                       |
| CAL "Prod" message at startup.                                                  | Instrument was not factory calibrated or lost factory calibration.              | Contact Hanna Technical Support for help.                                                                                                                                                                    |

Alkali Error with 1.0 mol/L Na<sup>+</sup>

| pH   | GP   | HT   | LT   |
|------|------|------|------|
| 11.5 | 0.11 | 0.01 | 0.46 |
| 12.0 | 0.21 | 0.06 | 0.62 |
| 12.5 | 0.32 | 0.11 | 0.79 |
| 13.0 | 0.43 | 0.15 |      |
| 13.5 | 0.45 | 0.21 |      |
| 14.0 | 0.65 | 0.27 |      |

Remove the protective cap off the ORP electrode.

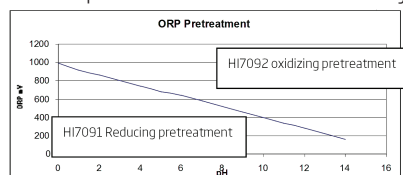
Wash off any SALT DEPOSITS. This generally confirms the reference junction is free flowing.

If the storage cap is dry, the reference junction may be dry also. Soak the electrode in HI 70300 or HI 80300 storage solution for at least one hour. Keep the reference electrolyte topped off and the fill hole cover off during operation.

Add HI 7082 or HI 8082 3.5M KCl Electrolyte Solution for double junction electrodes.

### Pretreatment

For a faster response, pretreat the ORP metal surface by soaking it for 15 minutes. Pretreatment with HI 7091 Reducing Pretreatment Solution, or HI 7092 Oxidizing Pretreatment Solution can prepare the metal surface for faster electron exchange with sample. See mV and pH to determine what treatment you should use.



### Measurement

Rinse the electrode tip with distilled water. Submerge the tip 3 cm (1¼") in the sample and stir gently for a few seconds.

For a faster response and to avoid cross-contamination of the samples, rinse the electrode tip with a few drops of the sample before taking measurements.

### Storage Procedure

To minimize clogging and ensure a quick response time, protect the ORP sensor by using the storage cap. Add a few drops of HI70300 storage solution to the cap to keep the reference junction wetted.

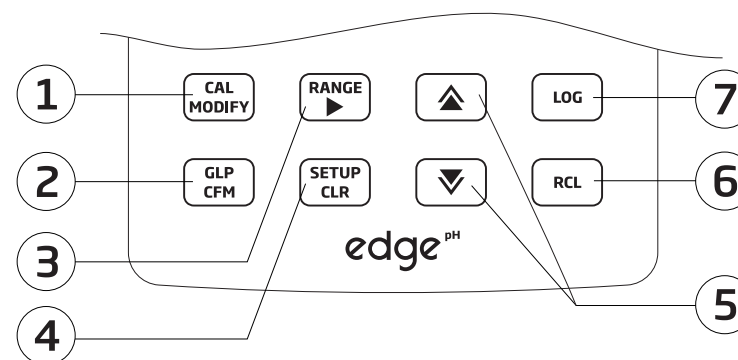
### Periodic Maintenance

Inspect the sensor and cable. The cable used for connection to the edge must be intact and with no points of broken insulation.

The ORP metal surface must be smooth with no scratches. The metal surface can be polished with a fine-grained emery cloth or powdered alumina.

### Cleaning Procedure

Use diagnostic messages to aid troubleshooting. Several cleaning solutions are available: See pH cleaning for specific contaminants or use a solvent system capable of dissolving the coating firm.



**1. CAL/MODIFY** - Used to enter and exit **calibration** mode. In SETUP, used to initiate changes of a configuration setting.

**2. GLP/CFM** - Used to display GLP calibration information. In SETUP, used to **confirm** change made. In calibration, used to accept calibration points.

**3. RANGE/►** - Used to select measurement range. In SETUP, used to move to right in pick list. In log RCL, used to view GLP data for a data point.

**4. SETUP/CLR** - Used to enter/exit SETUP mode. During calibration, used to clear previous calibration data. In log RCL, used to clear log records.

**5. ▼/▲** - Used to scroll through SETUP menu. Used to change selection when modifying a parameter in SETUP.

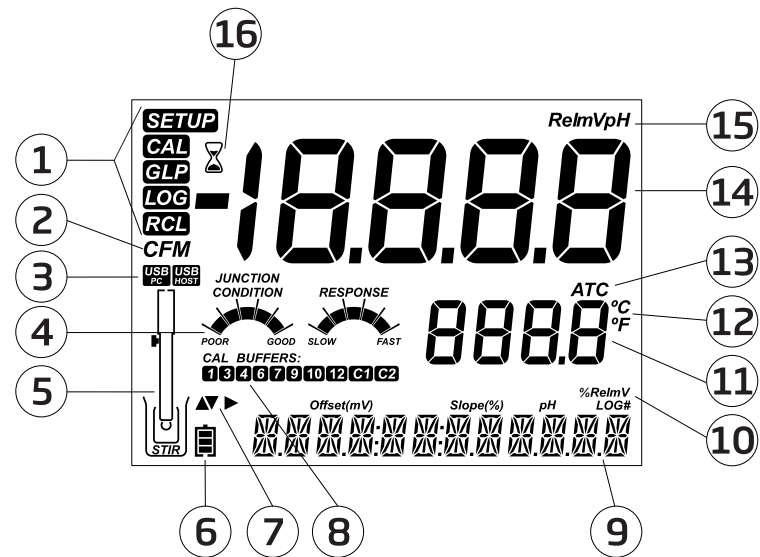
**6. RCL (Recall)** - Used to view logged records or view % log memory used.

**7. LOG** - Used to log data by manual log on demand or manual log on stability or to start/stop interval logging.

**Note:** You can increase/decrease the speed to change the value of a parameter.

Proceed as follows:  
Press and hold down the ▲ or ▼ key, then slide the finger toward the double apex to increase the speed that a value changes.





- |                                                  |                                              |
|--------------------------------------------------|----------------------------------------------|
| 1. Mode tags                                     | 9. Third LCD line, message area              |
| 2. Confirm tag                                   | 10. Labels                                   |
| 3. USB connection status                         | 11. Second LCD line, temperature measurement |
| 4. pH electrode diagnostics                      | 12. Temperature units                        |
| 5. Probes symbol                                 | 13. Temp. Compensation status                |
| 6. Battery symbol                                | 14. Measurement line                         |
| 7. Arrow tags, displayed when they are available | 15. Measurement units                        |
| 8. pH calibration buffers used                   | 16. Stability Indicator                      |

The third line of the LCD (9) is a dedicated message line. During measurement the user may use the ▲▼ arrows to select desired message. Options include date, time, calibration data, battery charge or no message. If a measurement error or log status change occurs during measurement, the third line will display a pertinent message.

Replace the solution in the protective cap with a few drops of HI 70300 or HI 80300 Storage Solution or, in its absence, Filling Solution (HI 7082 or HI 8082 for double junction electrodes).  
Follow the preparation procedure before taking measurements.  
**Note:** NEVER STORE THE ELECTRODE IN DISTILLED OR DEIONIZED WATER.

**Periodic Maintenance**

Inspect the electrode and the cable. The cable used for connection to the instrument must be intact and there must be no points of broken insulation on the cable or cracks on the electrode stem or bulb. Connectors must be perfectly clean and dry. If any scratches or cracks are present, replace the electrode. Rinse off any salt deposits with water.  
For refillable electrodes: Refill the reference chamber with fresh electrolyte (HI 7082 or HI 8082 for double junction electrodes). Allow the electrode to stand upright for 1 hour.  
Follow the Storage Procedure above.

**Cleaning Procedure**

Use diagnostic messages to aid pH electrode troubleshooting. Several cleaning solutions are available:

- General – Soak in Hanna HI 7061 or HI 8061 General Cleaning Solution for approximately ½ hour.
- Protein – Soak in Hanna HI 7073 or HI 8073 Protein Cleaning Solution for 15 minutes.
- Inorganic – Soak in Hanna HI 7074 Inorganic Cleaning Solution for 15 minutes.
- Oil/grease – Rinse with Hanna HI 7077 or HI 8077 Oil and Fat Cleaning Solution.

**Note:** After performing any of the cleaning procedures, rinse the electrode thoroughly with distilled water, refill the reference chamber with fresh electrolyte (not necessary for gel-filled electrodes) and soak the electrode in HI 70300 or HI 80300 Storage Solution for at least 1 hour before taking measurements.

**Temperature Correlation For pH Sensitive Glass**

Verify the temperature range by reading the limits on electrodes cap. The pH electrode's life also depends on the temperature that is used. If constantly cycled between two temperatures, the life of the electrode is drastically reduced.

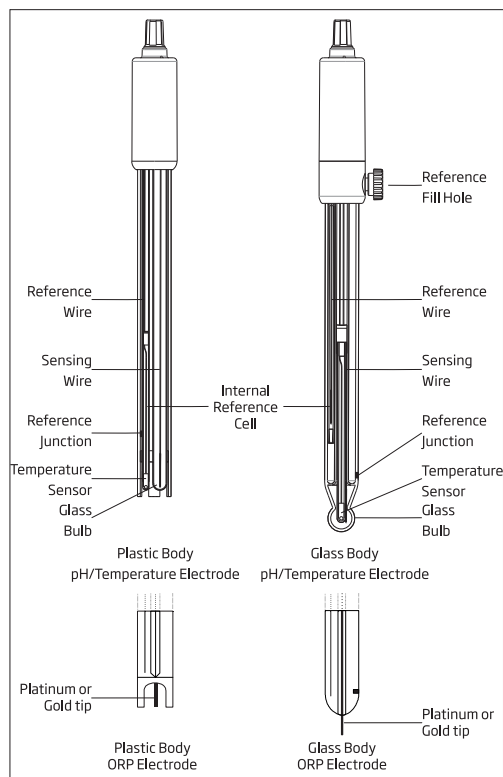
**Alkaline Error**

High concentrations of sodium ions interfere with readings in alkaline solutions. The pH at which the interference starts to be significant depends upon the composition of the glass. This interference is called alkaline error and causes the pH to be underestimated. Hanna's glass formulations have the indicated characteristics.

Sodium Ion error for various glass types at ambient temperature

| Alkali Error with 0.1 mol/L Na <sup>+</sup> |      |      |      |
|---------------------------------------------|------|------|------|
| pH                                          | GP   | HT   | LT   |
| 12.5                                        | 0.11 | 0.05 | 0.28 |
| 13.0                                        | 0.23 | 0.11 | 0.35 |
| 13.5                                        | 0.35 | 0.16 | 0.45 |
| 14.0                                        | 0.48 | 0.20 | 0.54 |





Remove the protective cap of the pH electrode.

DO NOT BE ALARMED IF SALT DEPOSITS ARE PRESENT.

This is normal with electrodes. They will disappear when rinsed with water.

During transport, tiny bubbles of air may form inside the glass bulb affecting proper functioning of the electrode. These bubbles can be removed by “shaking down” the electrode as you would do with a glass thermometer. If the bulb and/or junction is dry, soak the electrode in HI 70300 or HI 80300 storage solution for at least one hour.

For refillable electrodes:

If the filling solution (electrolyte) is more than 2½ cm (1”) below the fill hole, add HI 7082 or HI 8082 3.5M KCl Electrolyte Solution for double junction electrodes. Unscrew the fill hole cover during measurements so the liquid reference junction maintains an outward flow of electrolyte.

### Measurement

Rinse the electrode tip with distilled water. Submerge the tip 3 cm (1¼”) in the sample and stir gently for a few seconds.

For a faster response and to avoid cross-contamination of the samples, rinse the electrode tip with a few drops of the solution to be tested, before taking measurements.

### Storage Procedure

To minimize clogging and ensure a quick response time, the glass bulb and the junction should be kept moist and not allowed to dry out.

The main operating modes of edge<sup>pH</sup>® are setup, calibration, measurement, data logging, and data export. Follow this general outline of steps to get you started. The following topics are expanded upon in the sections that follow in this manual.

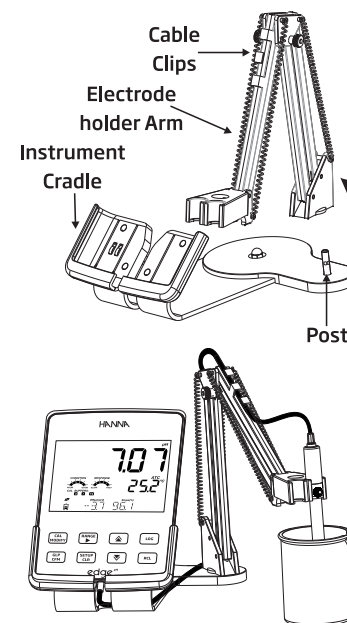
1. Familiarize yourself with the design features of this unique meter.
2. Decide how the meter will be used and set up the wall or bench cradle in a clean area near line power.
3. Turn edge<sup>pH</sup>® on using the ON/OFF button located on the top of the meter.
4. Plug in the probe required for measurement.
5. SETUP the measurement parameters required for the measurement you will be making.
6. Calibrate the sensor/probe.

You are now ready for measurements.

### Bench Cradle Setup

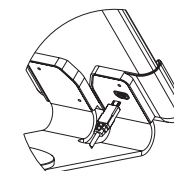
Insert electrode holder arm into the post on the pivoting base.

Connect the probe connector to the socket located at the bottom of the instrument.



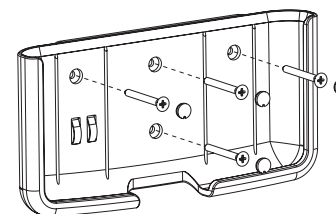
Slide edge<sup>pH</sup>® into the cradle while positioning the probe cable behind the cradle. Put the probe/sensor into the electrode holder and secure cable in clips.

Connect the power adapter cable to the rear socket of the bench cradle. Connect the other end to the power adapter and plug into line power. Verify the battery icon indicates charging.

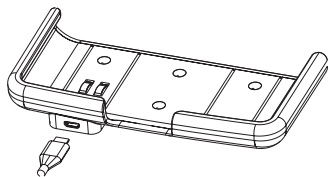


### Wall Cradle Setup

Choose suitable wall location. (Use 2.5 mm or US #3 bit). Fasten the wall cradle using the provided screws. Snap cover over screw heads.



## Setting Up edge<sup>pH</sup>®

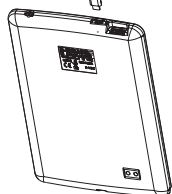
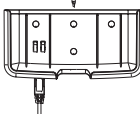


Connect the power adapter cable to the bottom socket of the wall cradle. Connect the other end to the power adapter and plug into line power.



Connect the 3mm probe jack to the socket located at the bottom of edge<sup>pH</sup>®.

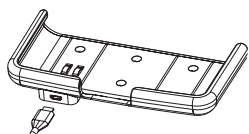
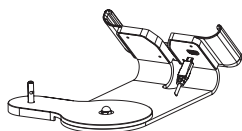
Slide edge<sup>pH</sup>® into the wall cradle. Verify the battery icon indicates charging.



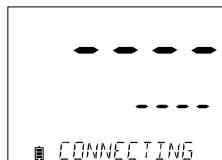
### Power Connection

Alternatively to using the cradle for power, edge<sup>pH</sup>® can be powered by micro USB socket at the top. Plug the 5 VDC adapter into the power supply socket or by connecting directly to a PC.

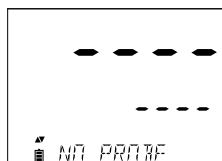
**Note:** edge<sup>pH</sup>® is supplied with a rechargeable battery inside, which provides about 8 hours of continuous use. Whenever edge<sup>pH</sup>® is connected to the power adapter or to a PC, the battery is charging.



## Electrode & Probe Connections



Connect the 3mm probe jack to the probe input located on the bottom of edge<sup>pH</sup>®. **Make sure the probe is completely connected.** If the probe is recognized, "CONNECTING" message is displayed along with sensor model.



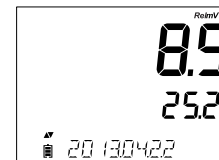
If the probe is not connected or not recognized, "NO PROBE" message is displayed.

When an ORP electrode is connected, the instrument will recognize it and the probe code will be displayed along with "ORP". Press any key to skip the message. The instrument will enter measurement mode. Rinse the sensor with water and a sample if possible. Submerge the electrode tip approximately 3 cm (1¼") into the sample to be tested and stir sample gently. Allow time for the electrode to stabilize.



## Relative mV Measurement

The Relative mV value is displayed on the first LCD line and the temperature on the second LCD line. Using the ARROWS, date, time, battery status and offset can be displayed on the third LCD line. If the reading is out of measurement range, the closest full scale value will be displayed blinking on the first LCD line.



### Error Messages During Measurement

If the mV or temperature exceeds the limits of the sensor, the message "ELECTRODE OUT OF SPEC" will scroll on the third LCD line. The temperature will continue to be displayed. If temperature exceeds the meter specification of 120° C, then "120° C" will blink on the display. If interval logging, the message "OUT OF SPEC." will alternate with the LOG specific message in both these cases and the Log file will indicate a "°C!" next to the data.



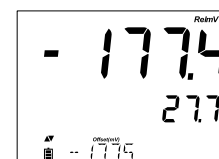
In case the temperature sensor is damaged, "BROKEN TEMPERATURE SENSOR" will be displayed and the temperature will display "25.0" and the unit tag blinking on the second LCD line. The Log file will indicate "°C!!" next to the data.



### RelmV Reading

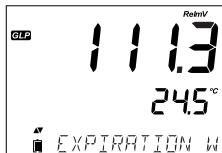
The RelmV reading can be displayed on the LCD by pressing the RANGE key.

The relative mV reading is equal to the difference between the absolute mV input and the relative mV offset established in the relative mV calibration.



Absolute ± Offset = Relative  
mV      mV      mV

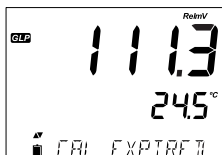




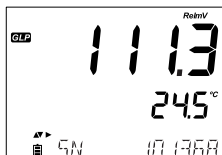
If disabled, "EXPIRATION WARNING DISABLED" is displayed.



Or if enabled the number of days until the calibration alarm "CAL DUE" will be displayed. (i.e. "CAL EXPIRES IN 2 DAYS")



The number of days since the calibration expired. (i.e. "CAL EXPIRED 2 DAYS AGO").



The probe serial number together with the current reading.

The following General Setup options are displayed regardless of the sensor being used. These settings remain when switching to another probe type or when no probe is attached. Options are tabulated in the table below with choices and default values. Options are accessed by pressing SETUP. Loop through the options by using the ▲▼ arrows. To modify a setting, press MODIFY. The option may be modified by using ►, ▲ and ▼ keys. Press CFM to confirm the change. To exit SETUP press SETUP.

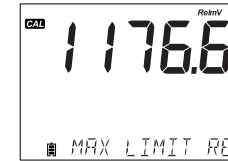
| Option                                                             | Description                                                                                                                 | Choices                                                                                | Default          | Basic mode                          |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------|-------------------------------------|
| *Only seen when cable connection between micro USB and PC is made. | Select if PC is being used for charging battery (and meter will be used for logging) or if Data will be exported to the PC. | LOG ON EDGE or EXPORT TO PC                                                            | LOG ON EDGE      | Available                           |
| Log                                                                | Select log type to be used from 3 types of logging:                                                                         |                                                                                        |                  |                                     |
|                                                                    | Manual log on demand                                                                                                        | Manual Log                                                                             |                  |                                     |
|                                                                    | Manual log on stability (3 types of stability criteria available)                                                           | Stability Log: Fast, Medium, Accurate;                                                 | Interval (5 Sec) | Manual log or Stability log: Medium |
|                                                                    | Timed interval lot logging                                                                                                  | Interval Log: Seconds: 5, 10, 30; Interval Log Minutes: 1, 2, 5, 15, 30, 60, 120, 180. |                  |                                     |
| Set Calibration Expiration Warning                                 | Meter will indicate "CAL DUE" when set time in this parameter has been exceeded.                                            | 1, 2, 3, 4, 5, 6, 7 days or OFF                                                        | 7 days           | Not available                       |
| Probe Specific                                                     | Parameters that are specific to a measurement type are inserted here in the SETUP list.                                     |                                                                                        |                  |                                     |
| Set Date                                                           | Press MODIFY key to Set current date, displayed in ISO format. Press CFM to save changes.                                   | YYYY/MM/DD Date                                                                        | Set date         | Available                           |
| Set Time                                                           | Press MODIFY key to Set current time, displayed in ISO format. Press CFM to save changes.                                   | 24hr:MM:SS Time                                                                        | Set time         | Available                           |

General  
Setup

| Option                                                                 | Description                                                                                                                                               | Choices                                        | Default                   | Basic mode                             |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------|----------------------------------------|
| Set Auto Off                                                           | Used to save battery life by automatically turning off when no key press is detected for time set and meter is not in active logging or calibration mode. | 5, 10, 30, 60 Min or Off                       | 10 MIN                    | Available                              |
| Sound                                                                  | If enabled, a short audible tone is produced for key stroke or calibration confirmation and a longer tone for wrong key.                                  | On or Off                                      | On                        | Available                              |
| Temperature Unit                                                       | Select degree Celsius or Fahrenheit scale for displayed and logged temperatures.                                                                          | °C or °F                                       | °C                        | Available                              |
| LCD Contrast                                                           | Permits modification of the display contrast for various lighting conditions.                                                                             | 1 to 8                                         | 3                         | Available                              |
| Flash Format*<br><small>Only seen when log errors are present.</small> | Permits formatting the flash drive.                                                                                                                       | On or Off                                      | OFF                       | Available                              |
| Message Transition                                                     | User may choose how messages are displayed on third LCD line of display.                                                                                  | Word scroll messages or letter scroll messages | Letter scroll messages    | Available                              |
| Reset Config To Default                                                | Press the MODIFY key and CFM (when prompted) to reset parameters.                                                                                         |                                                |                           | Available: RESETS with Basic Mode OFF. |
| Instrument Firmware/ Probe Firmware                                    | Displays firmware version of meter. Using the ► key switches to Probe firmware (if connected) and diagnostic made for troubleshooting.                    | View only                                      | Current firmware version. | Available                              |
| Meter ID/ Meter SN/ Probe SN                                           | User ID and Serial Number of meter and probe (if connected). Use ► to change between the three parameters.                                                | Meter ID is user selectable                    | 0000/ Serial Number       | Available                              |

\*Note: Options that are seen under special conditions only.

If the calculated offset is higher than  $\pm 2000$  mV the "MAX LIMIT REACHED" message will scroll on the third LCD line. Until the error is eliminated the value cannot be confirmed.



Press CFM to confirm the relative mV value. The display will show "SAVING" and returns to measurement mode.



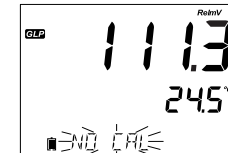
**Note:** The relative mV value can be changed only inside the relative mV offset window ( $\pm 2000$  mV).



Good Laboratory Practice (GLP) refers to a quality control function used to ensure uniformity of sensor calibrations and measurements. The dedicated GLP key opens a file of the latest calibration information. Use the ▼▲ keys to scroll the stored information. This includes the time and date of the last calibration, the sensor serial number and the offset. This information is also included with every data log.

Relative mV  
GLP  
Information

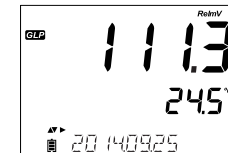
If calibration has not been performed, the instrument displays a blinking "NO CAL" message.



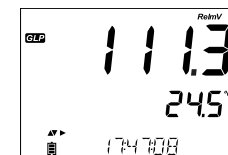
The relative mV calibration offset is displayed on the third LCD display.



Pressing the ▼▲ keys, the last calibration date (yyyy. mm.dd) together with the current reading is displayed.



The time of the last calibration is displayed along with the current reading.





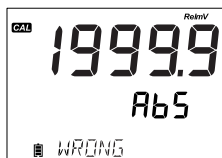
### Range Specific Messages Displayed On Third LCD Line During Measurement

All the messages described in General Setup (page 11) are displayed in pH range.

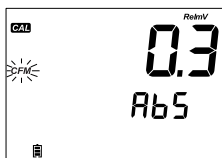
Temperature Sensor Problem (if there is one)  
Cal Due or Offset and Slope Value  
Time  
Date  
Battery or Charge Status  
Logging Messages  
Out of Calibration Range

### Calibration Procedure

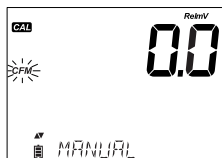
Pour small quantity of solution into clean beakers. If possible, use plastic beakers to minimize any EMC interferences. Submerge the ORP electrode approximately 3 cm (1¼") into the solution and stir gently. Press **CAL** when the instrument is in RELATIVE mV measurement mode. The "CAL" tag will appear and the Absolute mV is displayed on the primary LCD line and "AbS" message on the secondary LCD line. The "⌂" will be displayed and "WAIT" will blink on the third LCD line until the reading is stable.



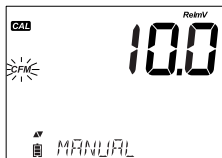
If the reading is out of range, "WRONG" will be displayed on the third LCD line.



When the absolute reading is stable and in measurement range, the instrument asks for confirmation, the "CFM" tag will blink.



Press **CFM** to confirm calibration. The instrument will display "0.0" RelmV on the primary LCD line with CFM tag blinking and "MANUAL" message on third LCD line. In this moment the relative mV offset is equal to absolute mV reading.



Use the **ARROW** keys for changing the displayed Relative mV value.

edge<sup>pH</sup>® offers a basic operation mode that streamlines measurement configuration for pH measurements and is useful for many routine applications. Basic pH SETUP reduces parameter selection to the basic set. The meter limits calibration to 5 standard pH buffers; 6.86, 7.01, 4.01, 9.18 and 10.01 buffers. All pH measurements will display, log and export with 0.01 pH resolution. Interval logging is also eliminated. Manual and Manual medium stability log on demand are still functional. pH CONDITION, RESPONSE graphs are not displayed, giving the display a "Basic" measurement screen with just pH data and temperature.

### Note:

- If powering edge<sup>pH</sup>® through the micro USB connector to a PC, a SETUP option will require the choice "LOG ON EDGE" or "EXPORT TO PC".
- 1000 log records can be stored into edge<sup>pH</sup>® memory. This memory is shared between all measurement types (pH, ORP) and all logging types (Manual, Manual Stability, Interval logs).
- The maximum number of records for an Interval lot is 600 records (provided log space is available).
- A record is a stored reading and a lot is a group of records.

Each time an Interval log is initiated, a new lot is created. The maximum number of Interval lots that may be stored is 100. If a 101<sup>st</sup> lot is attempted, "MAX LOTS" will be displayed. Some lots will need to be deleted. The lot numbering is up to 999 and restarts if all lot logs are deleted. All log on demand and stability log on demand are stored in a single lot. The maximum number of records that may be stored in a Manual or Stability lot is 200 records.



If the log memory is full during any logging session, the "LOG FULL" message will be displayed on the third LCD line for a brief moment and logging will cease. The display will return to the measurement screen.



Logging type is configured in SETUP.

### Types of Logging

Interval logging: A continuous log recorded using a user-selected timed period. (This is not available in Basic mode).

Manual log on demand: Readings are logged each time **LOG** key is pressed. All of the records are stored in a single Manual lot for the measurement type. New records made on different days are stored in the same Manual lot.

Manual Stability log on demand: A log on demand that is made each time **LOG** key is pressed and the stability criteria is reached. Stability criteria may be set to Fast, Medium or Accurate settings.

In Setup mode, choose log parameter, press **MODIFY** then use the ► arrow to select between Interval, Manual, or Stability. When Interval is displayed, use the ▲ and ▼ arrows to select the setting for the timed interval. When Stability is displayed, use the ▲ and ▼ to select the measurement stability setting.

A complete set of GLP information including date, time, range selection, temperature reading, calibration information and probe serial number is stored with each log made.

### Interval Logging

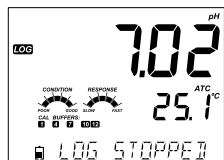
Select Interval and sampling period in the SETUP menu (Not available in Basic mode). To start Interval logging, press the **LOG** key while the instrument is in measurement mode.



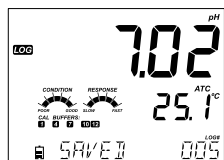
A "PLEASE WAIT" message will be displayed followed by the number of free spaces. During active interval logging, lot information is displayed on the third LCD line. The line indicates in which lot the data will be placed and keeps track of the number of logged records taken. The "LOG" tag is continuously on during active logging.



Pressing ► during an interval log will display the number of logs available.



Pressing the **LOG** key again will stop the Interval logging session. The "LOG STOPPED" message will be displayed for a few seconds.



If a sensor failure occurs during interval logging, the message "OUT OF SPEC." will alternate with logging information.

### Manual Logging

Select Manual in the SETUP menu. To initiate a Manual log, press the **LOG** key while the instrument is in measurement. The "PLEASE WAIT" screen will be displayed briefly followed by a screen indicating the measurement has been saved and then a screen indicating the log record number.



The "LOG" tag will be displayed on all 3 screens.  
"PLEASE WAIT"  
"SAVED" with the log record number  
"FREE" with the number of free spaces available

When a pH electrode is connected, the instrument will recognize it and the "REMOVE PROTECTIVE AND FILLING CAPS" message will be displayed along with "PH". Press any key to skip the message. The instrument will enter measurement mode. Make sure the electrode has been calibrated before taking measurements.



Rinse the pH sensor with water and a sample if possible. Submerge the electrode tip approximately 3 cm (1¼") into the sample to be tested and stir sample gently. Allow time for the electrode to stabilize.



The pH is displayed on the first LCD line and the temperature on the second LCD line. Using the ARROWS, date, time, battery status and offset with slope can be displayed on the third LCD line. If the reading is out of measurement range, the closest full scale value will be displayed blinking on the first LCD line.

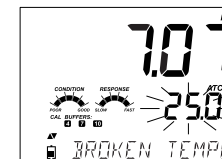
If measurements are taken successively in different samples, it is recommended to rinse the electrode thoroughly with deionized water or tap water and then with some of the next sample to prevent cross-contamination. The pH reading is affected by temperature. The temperature effect is compensated for using the temperature sensor inside the probe. The resulting measurement is the actual pH at the temperature of measurement.

### Error Messages During Measurement

If the pH or temperature exceeds the limits of the sensor, the message "ELECTRODE OUT OF SPEC" will scroll on the third LCD line. The temperature will continue to be displayed. If temperature exceeds the meter specification of 120° C, then "120° C" will blink on the display. If interval logging, the message "OUT OF SPEC." will alternate with the LOG specific message in both these cases and the Log file will indicate a "°C!" next to the data.

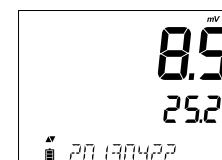


In case the temperature sensor is damaged, "BROKEN TEMPERATURE SENSOR" will be displayed and the temperature will display "25.0" and the unit tag blinking on the second LCD line. The Log file will indicate "°C!!" next to the data.



### mV Reading Of The pH

The mV reading of the measured pH can be displayed on the LCD by pressing the **RANGE** key.



**Note:** If a custom buffer was used in calibration, the "C1" and "C2" tags will be displayed. If only the one custom buffer is used in calibration, the tag will be "C1" and the value will be displayed.



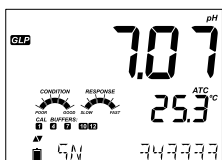
If disabled, "EXPIRATION WARNING DISABLED" is displayed.



Or if enabled the number of days until the calibration alarm "CAL DUE" will be displayed. (i.e. "CAL EXPIRES IN 2 DAYS")



The number of days since the calibration expired. (I.E. "CAL EXPIRED 2 DAYS AGO").

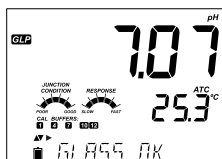


The probe serial number together with the current reading.



If a buffer is not from the last calibration, the buffer tag will be displayed blinking.

In Standard Mode, Condition and Response gauges are visible on the day of calibration (See Electrode Condition And Electrode Response Time page 24). If configured in SETUP, a countdown message displays the number of days remaining until a new Calibration is due.



If using a HI 11311 or HI 12301 sensor, the glass impedance is continuously monitored, updated and reported here and the Junction Condition Gauge is fully visible.

## Stability Logging

Select Stability and choose measurement stability criteria in the SETUP menu. Only Stability Medium is available in Basic mode. To initiate the Stability log, press the LOG key while the instrument is in measurement.

The "PLEASE WAIT" screen will be displayed briefly followed by a screen showing the stability tag, "LOG" tag and a "WAITING" message. The log can be stopped while the "WAITING" message is displayed by pressing LOG again.

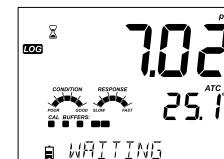
When the stability selected criteria has been met, a "SAVED" message will be displayed followed by a screen indicating how much log space is available. The "LOG" tag will be displayed on all 4 screens.

"PLEASE WAIT"

"WAITING"

"SAVED" with the log record number

"FREE" with the number of free spaces available



All log records stored on edge<sup>pH</sup>® may be viewed on the meter by pressing the RCL key. The log records are grouped according to measurement (pH, ORP).

The parameter displayed first is based on the probe/sensor connected. The display also indicates the percentage of log memory used. Press CFM to display those logs.

Choices are:

- Manual log on demand lot,
- Manual log on stability lot,
- Individual Interval logging lots.



If no data was logged for the selected measurement range, the instrument displays the following messages (ex. for pH range):

"NO MANUAL LOGS"

"NO STABILITY LOGS"





Press CFM to enter inside lot information to view recorded data.  
Use the ARROW keys to toggle between different records.  
Use ► to display GLP data including calibration information, date, time, etc.  
Press CLR then CFM when deleting records or lots.  
Press RCL to exit the logging type.  
Press RCL to exit the parameter selection screen.  
Press RCL to return to the measurement screen.



#### Delete Logging Type/Lot

Press RCL and select the parameter log.  
Use the ▲▼ keys to select the Manual/Stability records or Interval lots to delete. Press CLR. The instrument will display "CLEAR MANUAL" for Manual Records, "CLEAR STAB" for Stability Records.



For Interval lots, the message "CLEAR", followed by the selected lot will be displayed with "CFM" tag blinking. Press the ▲▼ keys to select a different lot. Press CFM. The instrument will display "PLEASE WAIT".



"CLEAR DONE" is displayed for a few seconds after the selected Interval lot is deleted.

#### Delete Records (Manual and Stability log on demand)

To delete individual records (Manual and Stability logs only), enter Manual (Stability) log by pressing CFM when Manual (Stability) is displayed. Use the ARROW keys to select the record to be deleted and then press CLR.

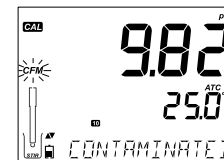


The instrument will display "CLEAR REC." and record number along with "CFM" tag blinking. Use the ARROW keys to select another record if necessary.

Press CFM. The instrument will display "PLEASE WAIT" and then "CLEAR DONE" message. When individual logs are deleted within saved MANUAL or STABILITY logs, the logs will renumber, filling in the deleted data but staying in chronological order.  
To delete all records of the MANUAL (STABILITY) log, proceed as described on page 16 for LOTS.

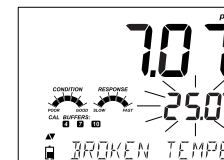
#### Contaminated Buffer

"CONTAMINATED BUFFER" appears in order to alert that the buffer could be contaminated. Refresh your buffer and continue the calibration procedure.



#### Broken Temperature Sensor

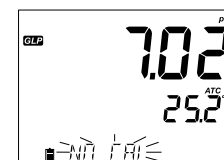
If the temperature sensor should malfunction or break at any time, a temperature of "25.0°C" will blink on the second LCD line and the message "BROKEN TEMPERATURE SENSOR" will appear on the third LCD line after leaving calibration. The calibration will have the compensation at 25 °C.



**Note:** If this occurs during logging "25 °C I" will appear in the CSV file.

Good Laboratory Practice (GLP) refers to a quality control function used to ensure uniformity of sensor calibrations and measurements. The dedicated GLP key opens a file of the latest calibration information. Use the ▼▲ keys to scroll the stored information. This includes the buffers used, temperature of the buffer, time and date of the last calibration, the sensor serial number and the calculated offset and percent slope. This information is available in Basic and Standard Modes. This information is also included with every data log. Newest calibration points report as a solid number, older calibration data (that is still used) will be displayed blinking.

If calibration has not been performed, the instrument displays a blinking "NO CAL" message.

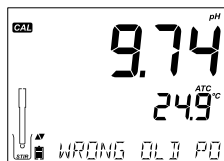


The pH calibration offset and slope (the GLP slope is the average of the calibration slopes; the percentage is referenced to the ideal slope value at the temperature of calibration). The condition and response indicators displayed are from the last calibration.

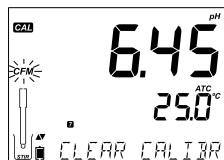


Pressing the ▼▲ keys, the last calibration date (yyyy. mm.dd) together with the current reading is displayed.



**Wrong Old Points Inconsistency**

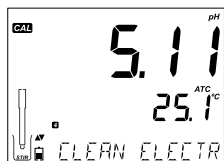
"WRONG OLD POINTS INCONSISTENCY" is displayed if the new calibration differs significantly from the last value of that sensor in that buffer. In this case it may be best to clear the previous calibration and attempt a new calibration with fresh buffers.



To clear calibration information, press **CAL** then press **CLR**. The "CLEAR CALIBRATION" message will be displayed. Either press the **CFM** key and clear all calibration information or press **CAL** to exit to keep old calibration data instead of clearing.



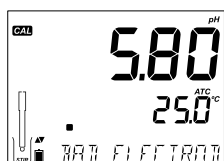
Once calibration information is cleared, the message "CAL DUE" will be displayed

**Clean Electrode**

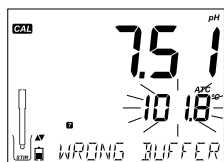
"CLEAN ELECTRODE" indicates poor electrode performance (offset out of accepted window, or slope under the accepted lower limit). Often, cleaning the sensor will improve the pH electrodes response. See pH Electrode Conditioning and Maintenance for details. Repeat calibration after cleaning.

**Check Electrode Check Buffer**

"CHECK ELECTRODE CHECK BUFFER" appears when electrode slope exceeds the highest accepted slope limit. You should check your electrode and use fresh buffer. Cleaning may also improve this response.

**Bad Electrode**

"BAD ELECTRODE" appears if the cleaning procedure performed as a result of the above two messages is found to be unsuccessful. In this case it is advised to replace the electrode.

**Wrong Buffer Temperature**

"WRONG BUFFER TEMPERATURE" appears if the temperature of the buffer is outside the defined buffer temperature range. The calibration buffer solutions are affected by temperature changes in a defined manner. During calibration, the instrument will automatically calibrate to the pH value

corresponding to the measured temperature but display it to the value at 25 °C. Immediately after calibration, the buffer should read the value of the buffer at the temperature of measurement.

**Note:** Temperature limits will be reduced to actual sensor specifications.

Select the Manual (Stability) lot and press **CLR**. The "CLEAR" message will be displayed along with "MANUAL" or "STABILITY" and **CFM** tag blinking on the LCD. Press the **CFM** key to confirm the deleting of the selected lot (MANUAL or STABILITY) or all records. Press **CLR** to exit without deleting.

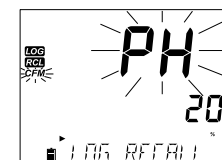


The lot number is used to identify particular sets of data. The lot numbers are allocated successively until 100, even if some lots were deleted. The total number of lots that can be saved is 100. If some are deleted (for example 1-50), fifty additional logs may be stored. These will be numbered 101-150. The lots are allocated successively (provided available memory space) until 999 is reached. After this, it is necessary to delete all the LOT logs to start over the numbering.

**Delete All**

All pH logs, (or all ORP logs) may be deleted in a single clear. This function will delete all MANUAL, STABILITY and INTERVAL logs.

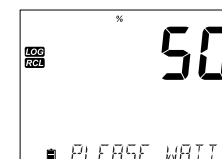
Press the **RCL** key. pH will be blinking. Use **►** to select desired measurement parameter log data to delete. (pH or ORP)



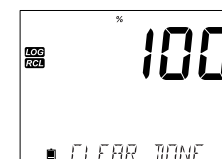
While the measurement type is blinking and message states "LOG RECALL", press **CLR**. "CLEAR ALL" and measurement type will be displayed with "CFM" tag blinking. Press **CFM**.



"PLEASE WAIT" and the percent cleared will be displayed until completed.



**Note:** If **CLR** is pressed in error, press **CLR** again to exit without deleting.



Logged data on edge<sup>PH</sup>® can be transferred from the meter to a USB flash drive by using the log recall function. The minimum requirement for the drive is USB 2.0. Select the pH record you wish to export and follow the simple steps below.



Connect USB flash drive to the USB port, located on the top of the meter. Press the RCL key. Select Manual, Stability, or interval lots by using the ▲▼ keys. Press the LOG key (not CFM). The “USB HOST” tag should come on.



“PLEASE WAIT” message appears followed by “EXPORT”. Press CFM to export the selected record or lot. If CFM is not pressed in 10 seconds, the USB host will become inactive.



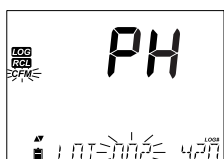
The meter will display the percentage of export.



The export percentage should go to 100%. Remove USB flash drive.



If the selected file is already saved on the flash drive, edge<sup>PH</sup>® will ask for confirmation of overwriting the existing file. The message “OVERWRITE” and “CFM” tag will blink. Press CFM for overwriting the existing file or CAL to exit without exporting.



After exporting the display will return to the selected file. Press the RCL key twice to return to measurements.

**Note:** Do not remove USB flash drive during an active export transfer.

- If the buffer temperature exceeds the temperature limits of the buffer, “WRONG BUFFER TEMPERATURE” will be displayed.
- Press CLR after entering calibration to clear all calibration options. “CLEAR ALL” message will be displayed and the instrument will return to measurement mode displaying “CAL DUE” message.

### pH Buffer Temperature Dependence

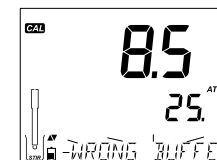
Temperature has an effect on pH. The calibration buffer solutions are affected by temperature changes also. During calibration the instrument will automatically calibrate to the pH value corresponding to the temperature. During calibration the instrument will display the pH buffer value at 25 °C.

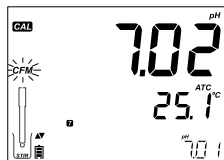
| TEMP      |           | pH BUFFERS   |              |              |              |              |              |               |               |
|-----------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| °C        | °F        | 1.679        | 3.000        | 4.010        | 6.862        | 7.010        | 9.177        | 10.010        | 12.454        |
| 0         | 32        | 1.670        | 3.072        | 4.007        | 6.982        | 7.130        | 9.459        | 10.316        | 13.379        |
| 5         | 41        | 1.670        | 3.051        | 4.002        | 6.949        | 7.098        | 9.391        | 10.245        | 13.178        |
| 10        | 50        | 1.671        | 3.033        | 4.000        | 6.921        | 7.070        | 9.328        | 10.180        | 12.985        |
| 15        | 59        | 1.673        | 3.019        | 4.001        | 6.897        | 7.046        | 9.273        | 10.118        | 12.799        |
| 20        | 68        | 1.675        | 3.008        | 4.004        | 6.878        | 7.027        | 9.222        | 10.062        | 12.621        |
| <b>25</b> | <b>77</b> | <b>1.679</b> | <b>3.000</b> | <b>4.010</b> | <b>6.862</b> | <b>7.010</b> | <b>9.177</b> | <b>10.010</b> | <b>12.450</b> |
| 30        | 86        | 1.683        | 2.995        | 4.017        | 6.851        | 6.998        | 9.137        | 9.962         | 12.286        |
| 35        | 95        | 1.688        | 2.991        | 4.026        | 6.842        | 6.989        | 9.108        | 9.919         | 12.128        |
| 40        | 104       | 1.693        | 2.990        | 4.037        | 6.837        | 6.983        | 9.069        | 9.881         | 11.978        |
| 45        | 113       | 1.700        | 2.990        | 4.049        | 6.834        | 6.979        | 9.040        | 9.847         | 11.834        |
| 50        | 122       | 1.707        | 2.991        | 4.062        | 6.834        | 6.978        | 9.014        | 9.817         | 11.697        |
| 55        | 131       | 1.715        | 2.993        | 4.076        | 6.836        | 6.979        | 8.990        | 9.793         | 11.566        |
| 60        | 140       | 1.724        | 2.995        | 4.091        | 6.839        | 6.982        | 8.969        | 9.773         | 11.442        |
| 65        | 149       | 1.734        | 2.998        | 4.107        | 6.844        | 6.987        | 8.948        | 9.757         | 11.323        |
| 70        | 158       | 1.744        | 3.000        | 4.123        | 6.850        | 6.993        | 8.929        | 9.746         | 11.211        |
| 75        | 167       | 1.755        | 3.002        | 4.139        | 6.857        | 7.001        | 8.910        | 9.740         | 11.104        |
| 80        | 176       | 1.767        | 3.003        | 4.156        | 6.865        | 7.010        | 8.891        | 9.738         | 11.003        |
| 85        | 185       | 1.780        | 3.002        | 4.172        | 6.873        | 7.019        | 8.871        | 9.740         | 10.908        |
| 90        | 194       | 1.793        | 3.000        | 4.187        | 6.880        | 7.029        | 8.851        | 9.748         | 10.819        |
| 95        | 203       | 1.807        | 2.996        | 4.202        | 6.888        | 7.040        | 8.829        | 9.759         | 10.734        |

The Calibration Check™ feature may flag diagnostic messages during a calibration. As electrode aging is normally a slow process, substantial changes from previous calibrations are likely due to a temporary problem with the electrode or buffers that can be addressed easily. These messages are seen in Standard and Basic modes.

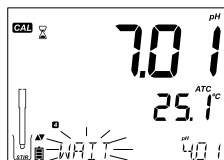
### Wrong Buffer

This message appears when the difference between the pH reading and the value of the selected buffer is too great. If this error message is displayed, check if you have selected the proper calibration buffer and have poured the desired buffer.





When the reading is stable and close to the selected buffer, the "CFM" tag will blink. Press **CFM** to confirm calibration.



After confirming the first calibration point, the calibrated value will be displayed on the first LCD line and the second expected buffer value on the third LCD line. (i.e. pH 4.01)

Rinse and submerge the pH electrode approximately 3 cm (1¼") into the second buffer solution and stir gently.

If necessary, press the ARROW keys to select a different buffer value.

The "⌘" along with "STIR" tag will be displayed and "WAIT" will blink on the LCD until the reading is stable. When the reading is stable and close to the selected buffer, the "CFM" tag will blink. Press **CFM** to confirm calibration.

The calibrated value is then displayed on the first LCD line and the third expected buffer value on the third LCD line.

After the second calibration point is confirmed, rinse and submerge the pH electrode approximately 3 cm (1¼") into the last buffer solution and stir gently.

If necessary, press the ARROW keys to select a different buffer value.

The "⌘" along with "STIR" tag will be displayed and "WAIT" will blink on the LCD until the reading is stable.

When the reading is stable and close to the selected buffer, the "CFM" tag will blink. Press **CFM** to confirm calibration.

At the end of calibration the instrument displays "SAVING", stores the calibration value and returns to normal measurement mode.

The calibration sequence may be reduced to two buffer values or a single one. Press **CAL** to return to measurement mode after the desired number of buffers have been calibrated.

#### Note:

- When performing a new calibration or adding to an existing calibration the first calibration point will be treated as an offset. See page 24 for details.
- Press **CAL** after the first or second calibration point are confirmed and the instrument will store the calibration data. Then it will return to measurement mode.
- If the value measured by the instrument is not close to the selected buffer, "WRONG BUFFER" will blink. Check if the correct buffer has been used, or clean the electrode by following the Cleaning Procedure. If necessary, change the buffer or the electrode.

Logged data on the edge<sup>pH</sup>® can be transferred from the meter to a PC by following these simple directions. Suitable operating systems include Windows (Xp minimum), OS X or Linux.

1. Connect edge<sup>pH</sup>® to the PC using the supplied micro USB cable.
2. Turn on edge<sup>pH</sup>®.
3. Press **SETUP** and select "LOG ON EDGE"
4. Press **MODIFY** then use ▲▼ keys to change to "EXPORT TO USB"
5. Press **CFM** and the USB/PC Tag is displayed.
6. Press **SETUP** to exit

The PC should detect the USB as a removable drive. Open the drive to view the stored files. Log files are formatted as Comma separated values (\*.CSV) and can be opened with any text editor or spreadsheet program.

#### Note:

- Western Europe (ISO-8859-1) character set and English language are suggested settings.
- Other files may be visible depending upon computer settings. All files stored will appear in this folder.
- Adjust Font or column width appropriately. Adjust the decimal places if the pH was logged with 0.001 resolution.

Interval logs are designated as pH or mV Lots. ie. PHLOT001, MVLOT002.

The Manual Lots are PHLOTMAN for pH and MVLOTMAN for ORP.

The Stability Lots are PHLOTSTAB for pH and MVLOTSTAB for ORP. All stability logs, regardless of stability setting, are located in the same stability file for that measurement.

Click on the desired log to view data.

#### Note:

- If "°C !" appeared in log data, the electrode/probe was used beyond it's operation specifications and the data is not considered reliable.
- If "°C !!" appeared in log data, the temperature sensor within the probe or electrode is broken and the device should be replaced. Logged data should not be considered reliable.

## Operational Guide

### Basic vs Standard pH Mode

For optimum pH measurements, follow these steps:

1. Understand the benefits and features of Standard and Basic Operation.
2. Set up edge<sup>PH</sup>® meter by configuring preferences.
3. Calibration
4. Measurement

The “Standard” pH operation includes up to a 5-point buffer calibration, use of custom buffers, choice of displaying 0.001 pH resolution, use of the full diagnostic features of Calibration Check™ (that includes buffers used, probe condition, response time and messages indicating a contaminated buffer or pH sensor requiring maintenance during calibration). Additional Sensor Check™ indicators are available if using HI11311 or HI12301 pH electrodes. These include a continuous diagnostic to detect if the electrode is broken and at the time of calibration, a diagnostic to indicate the reference junction has been compromised or fouled by sample contamination. The Standard pH operation also includes full logging capability including Interval, Manual log on demand and Manual log on stability.

“Basic” pH operation provides a simplified SETUP menu; there are no decisions to make regarding the pH measurement itself. The meter will display 0.01 pH resolution and permit a 3-point buffer calibration from the following pH buffers; 4.01, 6.86, 7.01, 9.18 or 10.01. Calibration Check™ and Sensor Check™ features are limited to messages during calibration. Calibration reminders are also not available. The GLP will still provide offset, slope, buffers used and a calibration date. The Basic pH operation includes Manual log on demand and Manual log on stability (medium setting).

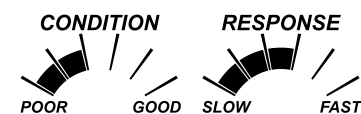
**Note:** When changing from Standard to Basic operation in SETUP, previous calibration data will be cleared. A prompt will force the user to facilitate this.

Major differences between Standard and Basic modes are shown below.

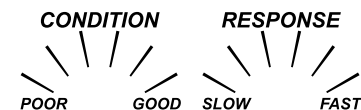
|                            | Standard                                                                                        | Basic*                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Calibration                | 5 points including 2 custom buffers                                                             | 3 points                                                    |
| Diagnostics                | Cal Check™ Feature<br>Sensor Check™ Feature<br>Error messages<br>GLP                            | Basic error messages<br>GLP basic                           |
| Log types                  | Manual Log on demand<br>Manual Log on stability<br>(Fast, Medium, Accurate)<br>Interval Logging | Manual Log on demand<br>Manual Log on stability<br>(Medium) |
| Recommended pH electrodes: | HI 11310, HI 12300<br>HI 11311, HI 12301<br>HI 10530, HI 10430                                  | HI 11310*<br>HI 12300                                       |

\* All Sensors work in this mode, but diagnostic and all buffers will not be available.

## pH Calibration



If the instrument is not calibrated the calibration history has been deleted, or it has been calibrated only at one point, the electrode condition and the electrode response gauges will be empty.



For a continuous display of the electrode's condition and response, daily calibration is necessary. This information can also be viewed in the GLP data.

### Junction Condition (HI11311 and HI12301 Only)

edge's pH Sensor Check™ feature assess the health of the pH electrode's reference junction during each calibration. The junction gauge may be viewed directly in GLP but will also blink a warning on the display if the junction is compromised (not 100%). Should this happen, the junction condition will appear on the display with the junction blinking. The Junction Condition is a function of the electrode's reference impedance which should be kept low. If the reference junction becomes fouled from a precipitate or coating, the impedance will rise and cause the pH measurement to drift. This diagnostic feature serves as a warning to clean the sensor.



### Calibration in Basic Mode Procedure

Basic mode operation permits up to three-point buffer calibration. For accurate measurements, at least a two-point calibration is recommended. However, a single point calibration can also be used. The calibration buffers can be selected from the calibration buffer list that includes the standard buffers, pH 4.01, 6.86, 7.01, 9.18 and 10.01.

### Three-Point Calibration

Submerge the pH electrode approximately 3 cm (1¼") into a buffer solution and stir gently. Press CAL. The “CAL” tag will appear and the “7.01” buffer will be displayed on the third LCD line. If necessary, press the ARROW keys to select a different buffer value.

The “⌚” along with “STIR” tag will be displayed and “WAIT” will blink on the LCD until the reading is stable.



**Note:** Custom buffer values can be adjusted  $\pm 1.00$  pH around the set value during calibration. When a custom buffer is displayed, the “C1” or “C2” tag is displayed.

### First Calibration Point

When performing a new calibration, or adding to an existing one, the user has a choice of how the first new calibration point will be treated in reference to the existing calibration point. This is selected in SETUP by the option FIRST CALIBRATION POINT. The two SETUP selectable options are “POINT” or “OFFSET”.

**Point:** A buffer value can be recalibrated and added to the previous calibration set. The electrode slope of the other calibration points will be reevaluated with the recalibrated buffer value.

**Offset:** The new buffer calibration point can create a constant offset to all existing pH calibration data (existing calibration must have a minimum of two pH buffers)

Recalibrating a pH sensor or adding to an existing calibration is simple and follows the PROCEDURE outlined on page 22.

Press **CAL**. Place sensor in desired buffer and select buffer from choices. When sensor has equilibrated, the **CFM** tag will turn on and blink. Press the **CFM** key.

Press **CAL** to escape the calibration. Alternately continue calibrating in additional buffers. The latest calibration point will be added to the existing data. GLP will reflect the latest calibration data. Older calibration buffers will be seen as blinking buffers.



**Note:** Each time a buffer is confirmed, the new calibration data replaces the old data for the corresponding buffer or for any buffer in the proximity of  $\pm 0.2$  pH. If the current buffer has no previous data stored and the calibration has not used five buffers, the current buffer is added to the existing calibration. If the existing calibration is full, the instrument asks which buffer to replace.

**Note:** When using Standard mode, the user can choose if they want the display to show the CONDITION and RESPONSE gauges on the display. These are part of the Cal Check™ system and are selected in SETUP by the option INFORMATION. The choice is ON or OFF.

### Electrode Condition and Electrode Response Time

edge<sup>pH</sup>® pH Calibration Check™ feature will assess electrode condition and response time during each calibration and display it for the rest of the day.

The condition gauge shows the electrode's condition that is based on the offset and slope characteristics of the pH electrode at the time of calibration. The response gauge is a function of the stabilization time between the first and second calibration buffers, when calibration is performed between a pair of 4.01, 7.01, or 10.01 buffers. These gauges reflect the electrode's performance and should be expected to slowly decrease over the life of the electrode.

edge's pH meter operation is configured by using the SETUP key with a pH probe connected to the meter. The parameter-specific options will be seen inserted into the menu. If Basic mode is “On”, the pH parameter list will not be displayed. See Basic mode for a description of this operation before choosing how to SETUP the meter.

| Option                       | Description                                                                                                                                            | Choices          | Default | Basic mode                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|-----------------------------------------------------------------------|
| Basic Mode                   | When “On”, a limited set of parameters and calibration buffers are available for use.                                                                  | Off or On        | Off     | Available                                                             |
| Information                  | Visual indication of buffers used, Probe Condition and Response times are determined and displayed when calibration uses 7 and 4 and/or 10 pH buffers. | Off or On        | On      | Buffers used, probe conditions, and response times are not displayed. |
| First Custom Buffer          | When “On”, it permits the user to enter a custom pH buffer value to use during electrode calibration.                                                  | Off or value     | Off     | Not Available                                                         |
| Second Custom Buffer         | When “On”, it permits the user to enter a custom pH buffer value to use during electrode calibration.                                                  | Off or value     | Off     | Not Available                                                         |
| First Calibration Point      | Allows the user to choose how the first point in calibration will be made.                                                                             | Offset or point  | Offset  | Not Available (automatically uses Offset).                            |
| Resolution                   | Allows the user to select between 0.01 and 0.001 pH resolution.                                                                                        | 0.01 or 0.001 pH | 0.01 pH | Not Available (automatically uses 0.01 pH resolution).                |
| Set Out Of Calibration Range | When set to “On”, a measurement that is outside the calibrated range (buffers used) will trigger a warning message.                                    | Off or On        | On      | Not Available, No Error messages displayed.                           |

### Calibration in Standard Mode

pH operation in standard mode offers full function of edge<sup>pH</sup>®. This includes seven standard buffers and two custom ones. Five pH buffers may be used for calibration.

The instrument should be recalibrated whenever:

- High accuracy and sensor verification are required.
- The pH electrode is replaced.
- At least once a week.
- After testing aggressive chemicals.
- If “CAL DUE” is displayed on the third LCD line.

Every time you calibrate the instrument use fresh buffers and perform electrode maintenance as required. It is advised to choose calibration buffers that bracket the sample pH.

**Preparation**

Pour small quantities of the buffer solutions into clean beakers. If possible, use plastic to minimize any EMC interferences. For accurate calibration and to minimize cross-contamination, use two beakers for each buffer solution; one for rinsing the electrode and one for calibration. If you are measuring in the acidic range, use pH 7.01 or 6.86 as the first buffer and pH 4.01 (or 3.00\*) as the second buffer. If you are measuring in the alkaline range, use pH 7.01 or 6.86 as first buffer and pH 10.01 or 9.18 as the second buffer.

\* pH 3.00 is only visible when using specific pH electrodes and will replace 4.01 pH buffer.

**Procedure**

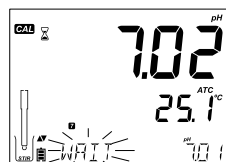
Calibration can be performed using up to five calibration buffers. For accurate measurements, a minimum of a three-point calibration is recommended. The calibration buffer can be selected from the calibration buffer list that includes the custom buffers and the standard buffers:

**pH 1.68, 4.01 (pH 3.00), 6.86, 7.01, 9.18, 10.01 and 12.45.**

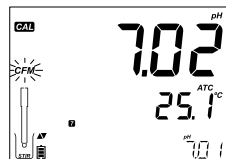
The custom buffers allow the user to calibrate in a buffer solution different from a standard one. Two custom buffers can be set in SETUP menu. See page 23 for more information about using custom buffers.

The instrument will automatically skip custom buffers which are in a  $\pm 0.2$  pH window of an already calibrated buffer.

Submerge the pH electrode approximately 3 cm (1¼") into a buffer solution and stir gently. Press CAL to enter calibration.



The "CAL" tag will appear and the "7.01" buffer will be displayed on the third LCD line. If necessary, press the ARROW keys to select a different buffer value. The "⌂" along with "STIR" tag will be displayed and "WAIT" will blink on the LCD until the reading is stable.



When the reading is stable and close to the selected buffer, "CFM" tag will blink. Press CFM to confirm calibration.



After confirming the first point, the calibrated value will be displayed on the first LCD line and the second expected buffer value on the third LCD line (i.e. pH 4.01).

Rinse and submerge the pH electrode approximately 3 cm (1¼") into the second buffer solution and stir gently. If necessary, press the ARROW keys to select a different buffer value.

The "⌂" along with "STIR" tag will be displayed and "WAIT" will blink on the LCD until the reading is stable.

When the reading is stable and close to the selected buffer, "CFM" tag will blink. Press CFM to confirm calibration.

Repeat procedure with additional pH buffers. A total of five pH buffers can be utilized.

After confirming the last desired buffer calibration points, press CAL (or if all five buffer values were calibrated) the instrument will automatically display "SAVING" as it stores information. It will then return to normal measurement mode.



Each time a buffer is confirmed, the new calibration data replaces the old data for the corresponding buffer or for any buffer in the proximity of  $\pm 0.2$  pH. If current buffer has no previous data stored and the calibration is not full (five buffers), the current buffer is added to the existing calibration. If the existing calibration is full, the instrument asks which buffer to replace.



Press the ARROW keys to select another buffer to be replaced. Press CFM to confirm the buffer that will be replaced. Press CAL to leave calibration without replacing.

**Note:** If the replaced buffer is outside the  $\pm 0.2$  pH window of the calibrated buffers, it is possible to select this buffer during the next calibration.

**Working With Custom Buffers**

If a custom buffer was set in SETUP menu, it can be selected during calibration by pressing the ARROW keys. The "C1" or "C2" tag will be displayed once selected.

Press ► if you want to modify the custom buffer value. The buffer value will start blinking.



Use the ARROW keys to change the buffer value. After 5 seconds, the buffer value is updated. Press ► if you want to change it again.





Anexo B.4: Carta Gantt detalle de actividades necesarias para el desarme y soporte  
de residuos del depósito N°6

| Planificación de actividades para el ajuste de dimensiones y capacidades del depósito N°6                                                                                                                                                                                                  |                |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
|                                                                                                                                                                                                                                                                                            |                | Meses |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Actividad                                                                                                                                                                                                                                                                                  | Duración (mes) | 1     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Trazado y nivelación de terreno nuevo depósito                                                                                                                                                                                                                                             | 1.5            |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Excavación y preparación de superficie nuevo depósito                                                                                                                                                                                                                                      | 3.5            |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Impermeabilización (adquisición e instalación) nuevo depósito                                                                                                                                                                                                                              | 5              |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Habilitación (obtención Resolución) nuevo depósito                                                                                                                                                                                                                                         | 2              |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Retiro y disposición respel desde Depósito N°6                                                                                                                                                                                                                                             | 4              |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Desarme depósito N°6                                                                                                                                                                                                                                                                       | 1.5            |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Cierre de celda (mov tierra e impermeabilización)                                                                                                                                                                                                                                          | 1              |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| Cierre de celda ante Autoridad Sanitaria                                                                                                                                                                                                                                                   | 2              |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
| La planificación que se muestra contempla la habilitación de un nuevo depósito para la recepción de los residuos depositados en la actualidad en el depósito n°6. Una vez vaciado y desarmado se procederá a replantear los límites y ajustar sus medidas a lo establecido en la RCA N°188 |                |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |

Anexo B.5: Plano proyección zona de disposición transitoria.



[illegible][illegible][illegible]

Technical drawing of a rectangular secondary wastewater treatment tank. The tank has a length of 91.6 m and a width of 15.6 m. It features a central area with diagonal hatching, surrounded by a safety zone (pretil trapezoidal de seguridad) and a peripheral safety zone (zanja perimetral de seguridad). The drawing includes section lines A-A, B-B, and C-C, and labels for the secondary wastewater collection system (SISTEMA DE RECOLECCION DE LIXIVIADOS SECUNDARIO).



Anexo B.6: Certificados y programa de capacitaciones brigada.



# CAPACITACION

Realizada por:

Duración

fecha

Ricardo Pizarro  
German Arancibia  
2 Horas  
agosto 2018

| Confirma |                          |     |       |       |
|----------|--------------------------|-----|-------|-------|
| Nº       | NOMBRE                   | RUT | CARGO | FIRMA |
| 1        | Ricardo Pizarro Castillo |     |       |       |
| 2        | Daniel Araya Farias      |     |       |       |
| 3        | José Gallardo Castro     |     |       |       |
| 4        | María Elvira Erazo       |     |       |       |
| 5        | BONIFACIO MUÑOZ          |     |       |       |
| 6        | ELVIN VILCHEA            |     |       |       |
| 7        |                          |     |       |       |
| 8        |                          |     |       |       |
| 9        |                          |     |       |       |
| 10       |                          |     |       |       |
| 11       |                          |     |       |       |
| 12       |                          |     |       |       |
| 13       |                          |     |       |       |
| 14       |                          |     |       |       |
| 15       |                          |     |       |       |
| 16       |                          |     |       |       |
| 17       |                          |     |       |       |
| 18       |                          |     |       |       |
| 19       |                          |     |       |       |
| 20       |                          |     |       |       |

## TEMAS TRATADOS Y RECOMENDACIONES

Control y Comando de Incidente en la Emergencia -

R. P. B.

Confinos



## CAPACITACIÓN

Realizada por:

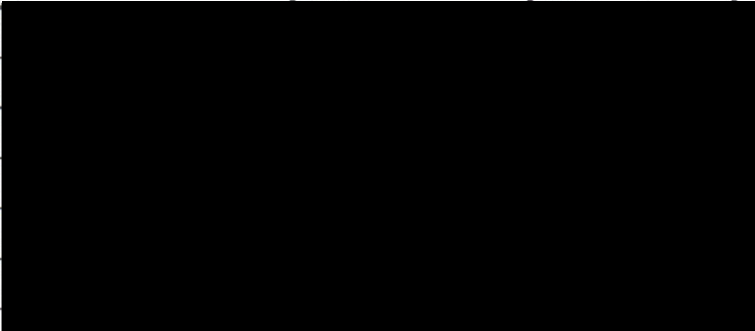
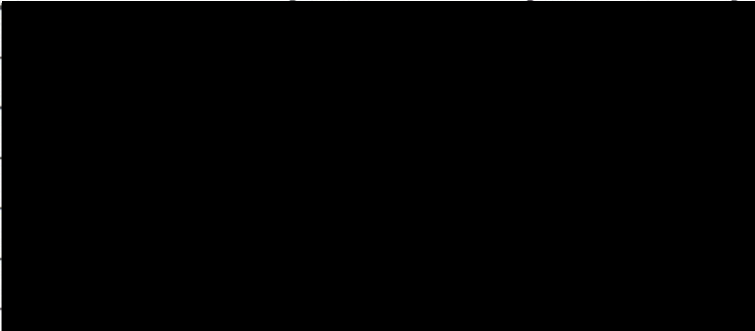
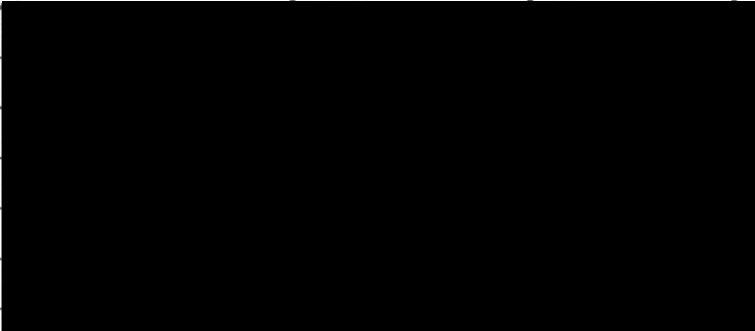
German Arancibia

Duración

1 1/2 Hora

fecha

agosto 2018

| Nº | NOMBRE          | RUT                                                                                | CARGO                                                                              | FIRMA                                                                              |
|----|-----------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1  | Ramon Pinones   |  |  |  |
| 2  | Francis Monroy  |                                                                                    |                                                                                    |                                                                                    |
| 3  | Daniel Araya    |                                                                                    |                                                                                    |                                                                                    |
| 4  | Edwin Videla    |                                                                                    |                                                                                    |                                                                                    |
| 5  | Bonifacio Muñoz |                                                                                    |                                                                                    |                                                                                    |
| 6  |                 |                                                                                    |                                                                                    |                                                                                    |
| 7  |                 |                                                                                    |                                                                                    |                                                                                    |
| 8  |                 |                                                                                    |                                                                                    |                                                                                    |
| 9  |                 |                                                                                    |                                                                                    |                                                                                    |
| 10 |                 |                                                                                    |                                                                                    |                                                                                    |
| 11 |                 |                                                                                    |                                                                                    |                                                                                    |
| 12 |                 |                                                                                    |                                                                                    |                                                                                    |
| 13 |                 |                                                                                    |                                                                                    |                                                                                    |
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| 15 |                 |                                                                                    |                                                                                    |                                                                                    |
| 16 |                 |                                                                                    |                                                                                    |                                                                                    |
| 17 |                 |                                                                                    |                                                                                    |                                                                                    |
| 18 |                 |                                                                                    |                                                                                    |                                                                                    |
| 19 |                 |                                                                                    |                                                                                    |                                                                                    |
| 20 |                 |                                                                                    |                                                                                    |                                                                                    |

TEMAS TRATADOS Y RECOMENDACIONES

Teoría del Mot. Pel -  
Bombos - Clasificación de los productos -  
Recometimiento

German Arancibia  
11/11/2018  




Confinor



# CAPACITACIÓN

Realizada por:

German Arancibia

Duración

3 Horas

fecha

17 julio 2018

Confinor

| Nº | NOMBRE             | RUT | CARGO | FIRMA |
|----|--------------------|-----|-------|-------|
| 1  | Jesús Galleguillos |     |       |       |
| 2  | Daniel Orjón       |     |       |       |
| 3  | Edwin Vichela      |     |       |       |
| 4  | Ramón Piñones      |     |       |       |
| 5  | Bonifacio Muñoz    |     |       |       |
| 6  | Francis Montoya    |     |       |       |
| 7  |                    |     |       |       |
| 8  |                    |     |       |       |
| 9  |                    |     |       |       |
| 10 |                    |     |       |       |
| 11 |                    |     |       |       |
| 12 |                    |     |       |       |
| 13 |                    |     |       |       |
| 14 |                    |     |       |       |
| 15 |                    |     |       |       |
| 16 |                    |     |       |       |
| 17 |                    |     |       |       |
| 18 |                    |     |       |       |
| 19 |                    |     |       |       |
| 20 |                    |     |       |       |

TEMAS TRATADOS Y RECOMENDACIONES

Teoría del Fuego, ABC,

Triángulo del Fuego,

Práctico: uso y manejo del extintor

aproximación y Combate de Incendios

German Arancibia  
14-15-086-5

Confinor



# CAPACITACION

Realizada por:

Helgen Rojas Wueber

Duración

2 1/2 Horas

fecha

23 julio 2018

Confinor

| Nº | NOMBRE             | RUT | CARGO | FIRMA |
|----|--------------------|-----|-------|-------|
| 1  | Jesús Salleguillas |     |       |       |
| 2  | Daniel Araya       |     |       |       |
| 3  | Edwin Videla       |     |       |       |
| 4  | Ramón Piñones      |     |       |       |
| 5  | Bonifacio Muñoz    |     |       |       |
| 6  | Francis Munoz      |     |       |       |
| 7  |                    |     |       |       |
| 8  |                    |     |       |       |
| 9  |                    |     |       |       |
| 10 |                    |     |       |       |
| 11 |                    |     |       |       |
| 12 |                    |     |       |       |
| 13 |                    |     |       |       |
| 14 |                    |     |       |       |
| 15 |                    |     |       |       |
| 16 |                    |     |       |       |
| 17 |                    |     |       |       |
| 18 |                    |     |       |       |
| 19 |                    |     |       |       |
| 20 | (Practico)         |     |       |       |

TEMAS TRATADOS Y RECOMENDACIONES

Primeros auxilios Basicos:  
Practico en:

Confinoz



# CAPACITACIÓN

Realizada por:

Nelson Rojas Wueber

Duración

2 1/2 Horas

fecha

20 julio 2018

Confinoz

| Nº | NOMBRE           | RUT | CARGO | FIRMA |
|----|------------------|-----|-------|-------|
| 1  | JESUS GALLEGO L. |     |       |       |
| 2  | DAVID ARAYA F.   |     |       |       |
| 3  | EDWIN VIDELA     |     |       |       |
| 4  | RAMON JACOB C.   |     |       |       |
| 5  | BONIFACIO MUÑOZ  |     |       |       |
| 6  | Franco Monroy    |     |       |       |
| 7  |                  |     |       |       |
| 8  |                  |     |       |       |
| 9  |                  |     |       |       |
| 10 |                  |     |       |       |
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| 15 |                  |     |       |       |
| 16 |                  |     |       |       |
| 17 |                  |     |       |       |
| 18 |                  |     |       |       |
| 19 |                  |     |       |       |
| 20 | (Teórico)        |     |       |       |

TEMAS TRATADOS Y RECOMENDACIONES

Primeros auxilios Básicos:

Control de Hemorragias Inmovilización de Fracturas y Columna Vertebral, Reanimación Cardíaca Pulmonar

Nelson Rojas Wueber





## EXTINTORES COMBAT - FIRE

CURSOS Y CAPACITACIONES EN GENERAL

FORMACION DE BRIGADAS DE INCENDIOS

COPIAPO - III REGION DE ATACAMA - CHILE

FONO: 232081 - CL-75730988

Copiapó, 12 de octubre 2018

Señores  
CONFINOR S.A.  
Presente

La empresa Combat Fire, informa a ustedes, que al personal de la empresa CONFINOR S. A., RUT 76.851.740-1, ubicado en Camino C-404 sector Llano Seco, Copiapó, se le realizó una Charla instructiva referente al Plan de Emergencia 2018. Quedando en esta, determinada la función de cada integrante, según consta en tabla adjunta

| NOMBRE                    |                            |
|---------------------------|----------------------------|
| Cesar Reinoso Echeverría  | Administrador              |
| María Eliana Erazo Espina | Jefe terreno               |
| Francis Monroy Salinas    | Comunicaciones             |
| Jesús Galleguillos Soto   | Jefe de brigada emergencia |
| Edwin Videla              | Integrante brigada         |
| Bonifacio Muñoz           | Integrante brigada         |
| Ramón Piñones             | Integrante brigada         |
| Daniel Araya Farías       | Integrante brigada         |

Saluda con especial atención

  
Ricardo Pizarro Báez  
Combat Fire

|                                                                                   |                             |                |                   |
|-----------------------------------------------------------------------------------|-----------------------------|----------------|-------------------|
|  | PLAN DE EMERGENCIAS<br>2018 |                | CÓDIGO: PPR.02    |
|                                                                                   |                             | Rev.: 0        | Fecha: 12.10.2018 |
|                                                                                   |                             | Página 2 de 14 |                   |

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| <b>2.0</b>  | <b>ALCANCE</b>                                    |
| <b>3.0</b>  | <b>TÉRMINOS Y DEFINICIONES</b>                    |
| <b>4.0</b>  | <b>RESPONSABILIDADES</b>                          |
| <b>5.0</b>  | <b>DESCRIPCIÓN</b>                                |
| <b>6.0</b>  | <b>ACCIONES INMEDIATAS ADOPTAR EN EMERGENCIAS</b> |
| <b>7.0</b>  | <b>RADIOS Y TELÉFONOS</b>                         |
| <b>8.0</b>  | <b>SANCIONES</b>                                  |
| <b>9.0</b>  | <b>MODIFICACIONES DEL DOCUMENTO</b>               |
| <b>10.0</b> | <b>ANEXOS</b>                                     |

|                                                                                   |                                     |  |                                |
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### 1. Objetivo.

Establecer, mantener una metodología para la preparación y respuesta ante emergencia y facilitar y agilizar el proceso de información de la señal de alarma en la faena.

El siguiente procedimiento describe el sistema para reportar, investigar y gestionar todas las situaciones de emergencia previsible, las cuales causan o tienen el potencial para causar daño a las personas, a la propiedad, pérdidas en los procesos o impactos en el medio ambiente.

### 2. Alcance.

El ámbito de aplicación de este documento, las instrucciones y procedimientos contenidos en este plan tienen el carácter de obligatorio para todo el personal de **Confinor**.

### 3. Términos y Definiciones.

- **Situación de emergencia:** Es un evento no programado ni controlado en su origen, cuyo impacto representa un riesgo inminente con daño a la integridad física de las personas, bienes y/o medio ambiente y que requiere de la aplicación de acciones inmediatas tendientes a controlar y mitigar sus efectos.
- **Incidente:** Evento no deseado que puede o no resultar en lesiones, daño al medio ambiente, daño a la propiedad, en el proceso o una combinación de estas.
- **Amago de Incendio:** Fuego incipiente que, detectado oportunamente se puede controlar y extinguir rápidamente mediante la utilización de extintores, agua o cualquier otro medio de extinción.
- **Incendio Declarado:** Fuego no controlado, que no puede ser extinguido por los medios disponibles. Tiene la propiedad de generar grandes cantidades de humos, gases tóxicos y temperatura radiante, dañinos para la salud de los trabajadores
- **Sismo:** Consiste en el desplazamiento brusco y de intensidad relativa de zonas de la corteza terrestre, con un potencial destructivo variable.
- **Explosiones:** Detonación incidental de los cilindros de gases comprimidos, producto del traslado, manipulación y almacenamiento de estos.

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- **Evacuación:** Procedimiento obligatorio, ordenado, responsable, rápido y dirigido de desplazamiento masivo de ocupantes de un recinto hacia la zona de seguridad (PEE) de éste, frente una emergencia real o simulada.
- **Zona de Seguridad (PEE):** Es aquel lugar físico, de la infraestructura que posee una mayor capacidad de protección masiva frente a los riesgos derivados de una emergencia y que además ofrece las mejores posibilidades de abandono definitivo de un recinto.

#### 4. Responsabilidades.

##### 4.1 Gerente General / Gerente de Operaciones.

- a. Deberán otorgar los recursos apropiados para el buen funcionamiento del presente plan de emergencias.
- b. Asignar los recursos necesarios en el área para mantener el equipamiento de emergencia requerido en los lugares de trabajo.
- c. Evaluar la condición de los riesgos actuales y las medidas de las acciones de control Implementado.

##### 4.2 Administrador.

- a. Participar en la realización del presente plan de emergencias de acuerdo a las operaciones realizadas en su área, asesorados por el Departamento de Prevención de riesgos.
- b. Evaluar la situación de emergencia cada vez que sea alertado.
- c. Finalizada una emergencia, deberá verificar o evaluar en terreno que las condiciones de trabajo son seguras para la reanudación de las actividades, previa autorización del Administrador.

##### 4.3 Jefe terreno.

- a. Identificar los riesgos de posibles emergencias que puedan ocurrir en el área de trabajo.
- b. Evaluar las condiciones de los riesgos actuales y el seguimiento de las acciones de control implementadas.
- c. Asesorar en la realización del presente procedimiento.



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- d. Establecer capacitación específica y permanente de los sistemas de protección contra incendios y primeros Auxilios, con apoyo del personal Paramédico de la faena.

#### **4.4 Supervisores.**

- a. Participar en la realización del presente plan.
- b. Difundir el presente Plan de Emergencias.
- c. Conocer, respetar y hacer respetar lo establecido en el plan de emergencias.
- d. Tomar las medidas de seguridad necesarias para proteger la vida y salud de los trabajadores.

#### **4.5 Trabajadores.**

- a. Participar en la capacitación del presente plan.
- b. Respetar y cumplir con las instrucciones impartidas por su jefe terreno directo como en lo establecido en el presente plan de emergencias.

### **5. DESCRIPCIÓN.**

#### **5.1 Inicio de la actividad.**

Toda persona que se enfrente una situación de emergencia deberá mantener la calma y actuar de la siguiente forma:

##### **5.1.1 Informar la Emergencia.**

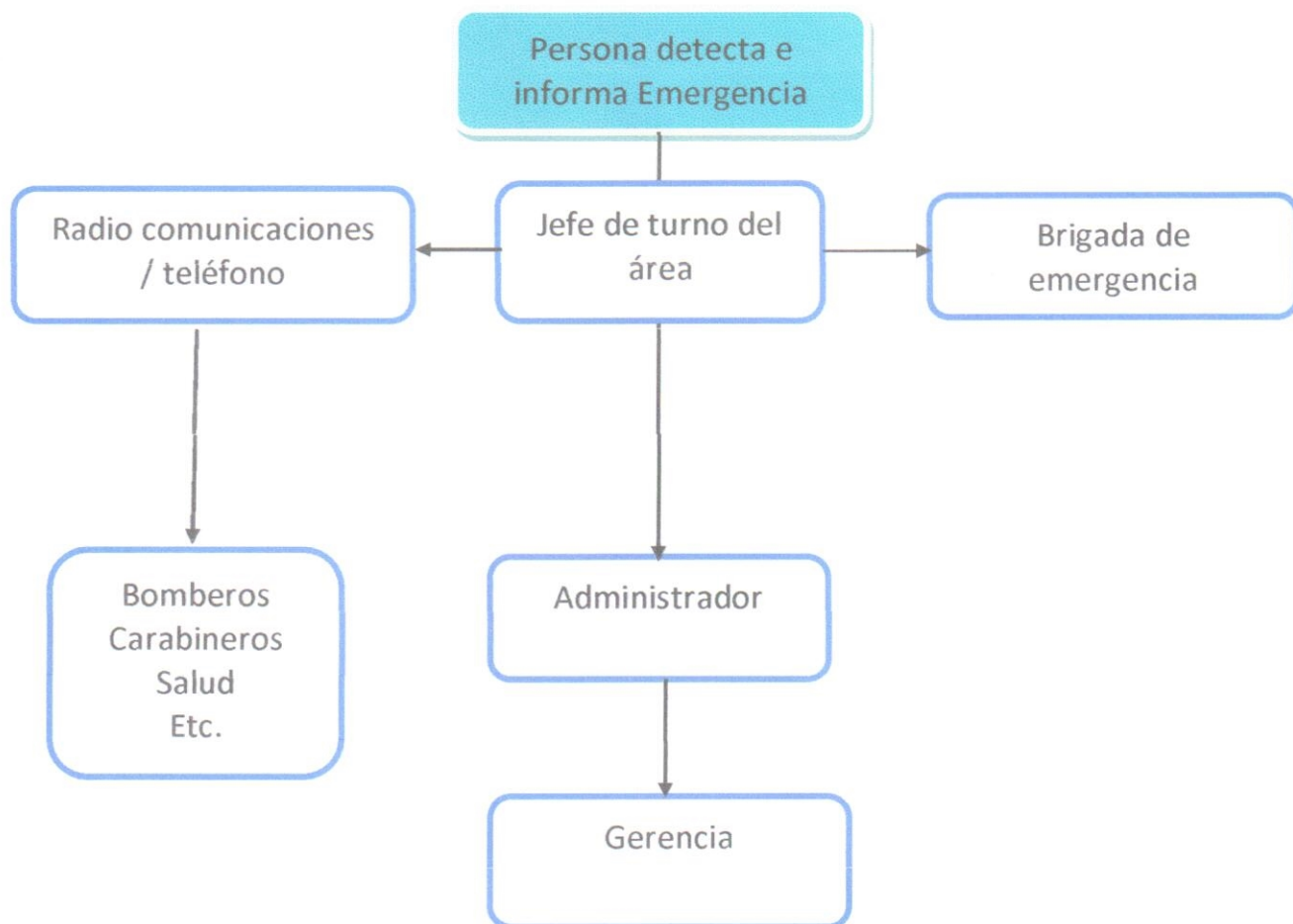
- Se deberá informar por radio comunicación o Celular a Jefe de turno del área, en conjunto a Administrador y/o Jefe terreno, quienes darán aviso Administrador de contrato de nuestra mandante, Depto. De Prevención de riesgos, brigada de rescate y policlínico, según corresponda al protocolo de información de emergencia de nuestra mandante.

**La persona que comunica la emergencia por teléfono / Radio deberá realizar lo siguiente:**

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- Se identificará (nombre y apellido).
- Comunicará el lugar exacto o algunas referencias donde ocurrió el incidente o emergencia.
- Comunicará el tipo de emergencia (entregar antecedentes claros y precisos)
- Características de la emergencia (incendio, rescate, derrame, etc.)
- Existencia de personas lesionadas, tipo de lesión y condición; atrapada, colgada, objeto sobre la persona, etc.
- Y cualquier otra información que ayude al control de ésta.

**FIGURA Nº 1**  
**DIAGRAMA DE COMUNICACIÓN FRENTE A UNA EMERGENCIA**



|                                                                                   |                                     |  |                                |
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- 5.1.2 El jefe de área, comunicará al jefe de terreno de la situación para que estos realicen una evaluación en terreno (tipo y gravedad) y así determinar la necesidad de recursos adicionales para el control de esta (carro de bomba, personal de medio ambiente, ayuda de otras áreas, ayuda externa, etc.).
- 5.1.3 El Jefe terreno determinará que es necesaria la presencia de recursos adicionales, comunicarán al Encargado del Despacho que solicite esta necesidad, quien solicitará silencio radial y dará las instrucciones pertinentes a todo el personal del área comprometida con la emergencia.
- 5.1.4 Una vez que el recurso adicional se encuentre en el lugar de la emergencia, los jefes de terreno junto al personal de emergencia se harán cargo del control de ésta.
- 5.1.5 El Jefe terreno en conjunto con el Supervisor del control de la emergencia evaluarán la necesidad de evacuar el área y si hay necesidad de que el personal se dirija a los Puntos de Encuentro de Evacuación (PEE).
- 5.1.6 El Encargado de Despacho dará aviso general que la situación de emergencia se encuentra controlada, para continuar con los trabajos en forma normal.

## 6. ACCIONES INMEDIATAS ADOPTAR EN EMERGENCIAS.

### 6.1 Lesiones a Personas.

En caso de accidentes con lesiones, la persona que detecte esta situación debe informar de manera inmediata por cualquier medio de comunicación a jefe de turno o jefe del área.

Durante el tiempo que demore en llegar el personal de policlínico o emergencia, si corresponde, actuará de la siguiente forma:

- No mover al lesionado a menos que su vida este en peligro.
- En caso de hemorragia, haga presión en el punto de sangramiento. No use torniquetes.
- En caso de shock eléctrico, desenergize el equipo, si no es posible retírelo con algún objeto no conductor de la electricidad. Si tiene conocimientos de respiración artificial y/o masaje cardiaco aplíquelos si es necesario.



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- En casos de situaciones de contacto con sustancias corrosivas, retire a la persona de la fuente de contaminación. Actúe de acuerdo a los instructivos de cada una de sustancias peligrosas, si no los conoce consulte a la sala de control.
- Para otro tipo de lesiones espere al personal paramédico.

## 6.2 Amagos / Incendios.

Al enfrentarse a un fuego o inicio de éste, se deberá actuar con los medios que se disponga en el lugar para su control, sin que ello signifique arriesgar su vida, para lo cual se deberá contar con capacitación básica de los equipos de emergencia del área. Reconociendo el lugar de origen y el estado de avance de las llamas.

- Si se logra **controlar** el amago de incendio, de avise a su jefe de turno directo del incidente ocurrido.
- Si **no** logra **controlar** el fuego, diríjase hacia los PEE, avise de inmediatamente a su Jefe de turno directo quien avisará a Administrador y espere instrucciones.

## 6.3 Accidente con daño material.

Al enfrentarse con un daño a equipos o instalaciones, deberá dirigir sus acciones principalmente al auxilio de personas que puedan estar involucradas en la emergencia, sin arriesgar su integridad física.

## 6.4 Derrames y/o Exposición a Sustancias Peligrosas.

Toda sustancia de carácter ácido, alcalino, venenosa, explosiva, inflamable, corrosiva o tóxicas, pueden ser peligrosas al entrar en contacto las personas con ellas o dañar el medio ambiente, y la gravedad de ellas dependerá del tiempo de exposición, del grado de contacto y de la cantidad de sustancia derramada o de la concentración de ésta en el ambiente. Ante un derrame, filtración, escape de una sustancia peligrosa, se deberá actuar de la siguiente manera:

- Deberá dar aviso de inmediato al Jefe turno quien se comunicará con Medio Ambiente.
- Revisar hoja de seguridad de sustancia (HDS) derramada para conocer reacciones que pudiese tener. No existir HDS, aléjese del área.

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- Prevenga de la situación a otras personas que transitan por el área.
- Apague fuentes de calor que puedan encender o generar gases, líquidos u otros materiales inflamables o tóxicos para el organismo.
- En caso de contacto y/o exposición con sustancias peligrosas, HDS de la sustancia y revisar medidas de primeros auxilios.

#### 6.5 Explosiones.

Una emergencia de este tipo puede ocurrir en acumuladores, cilindros y/o válvulas a presión, sustancias inflamables, etc.

- La medida inicial es ver la existencia de personas lesionadas para poder socorrerlos, dar aviso de la emergencia y luego aislar el área con el fin de determinar lo ocurrido.  
De no existir personas lesionadas, demarque el área y diríjase a la zona de seguridad PEE.
- No trate de volver al lugar de la explosión, por la probabilidad de réplica.

#### 6.6 Sismos.

En situaciones de movimientos naturales que pueden provocar pánico, se debe:

- Mantener el control. Detener los trabajos.
- Alejarse de lugares donde puedan caer elementos de altura o de los cuales puedan caerse a niveles inferiores.
- Alejarse de ventanas, estructuras que puedan colapsar.
- Alejarse de cables y tendidos eléctricos que se hallen sobre usted.
- En la medida que la situación lo permita, diríjase a los PEE. Sino puede salir a un lugar seguro, protéjase debajo de marcos de puertas, escritorios o mesas. Terminado el sismo salga a un área de seguridad, por la probabilidad de réplica.
- En caso de sismos mayores y si esta dentro de un vehículo, deténgase y permanezca en su interior.



## 6.7 Bajas temperaturas.

Si existen bajas temperaturas se deberá evaluar el riesgo de acuerdo a la siguiente tabla de sensación térmica, considerando dicha información para la realización de las tareas a la intemperie.

TABLA Nº 1

### SENSACIÓN TÉRMICA:

Valores equivalentes de enfriamiento por efectos del viento

| Velocidad del viento en km/h              | Temperatura real leída en el termómetro en °C                                             |     |     |     |                                                                                |     |     |     |                                                            |     |  |
|-------------------------------------------|-------------------------------------------------------------------------------------------|-----|-----|-----|--------------------------------------------------------------------------------|-----|-----|-----|------------------------------------------------------------|-----|--|
|                                           | 10                                                                                        | 4   | -1  | -7  | -12                                                                            | -18 | -23 | -29 | -34                                                        | -40 |  |
| CALMO                                     | 10                                                                                        | 4   | -1  | -7  | -12                                                                            | -18 | -23 | -29 | -34                                                        | -40 |  |
| 8                                         | 9                                                                                         | 3   | -3  | -9  | -14                                                                            | -21 | -26 | -32 | -38                                                        | -44 |  |
| 16                                        | 4                                                                                         | -2  | -9  | -16 | -23                                                                            | -31 | -36 | -43 | -50                                                        | -57 |  |
| 24                                        | 2                                                                                         | -6  | -13 | -21 | -28                                                                            | -36 | -43 | -50 | -58                                                        | -65 |  |
| 32                                        | 0                                                                                         | -8  | -16 | -23 | -32                                                                            | -39 | -47 | -55 | -63                                                        | -71 |  |
| 40                                        | -1                                                                                        | -9  | -18 | -26 | -34                                                                            | -42 | -51 | -59 | -67                                                        | -76 |  |
| 48                                        | -2                                                                                        | -11 | -19 | -28 | -36                                                                            | -44 | -53 | -62 | -70                                                        | -78 |  |
| 56                                        | -3                                                                                        | -12 | -20 | -29 | -37                                                                            | -46 | -55 | -63 | -72                                                        | -81 |  |
| 64                                        | -3                                                                                        | -12 | -21 | -29 | -38                                                                            | -47 | -56 | -65 | -73                                                        | -82 |  |
| Superior a 64 Km/h, poco efecto adicional | PELIGRO ESCASO<br>En una persona adecuadamente vestida para menos de 1 hora de exposición |     |     |     | AUMENTO DE PELIGRO<br>Peligro de que el cuerpo expuesto se congele en 1 minuto |     |     |     | GRAN PELIGRO<br>El cuerpo se puede congelar en 30 segundos |     |  |

|                                                                                   |                                     |                   |                |
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#### 6.8 Vientos o Tormentas.

En caso de presentarse vientos o tormentas, se debe:

- Permanecer en el interior de las instalaciones. Si se encuentra en terreno, refúgiase en lugares donde no se exista caída de objetos.
- Mantenerse alejado de líneas eléctricas.
- Si se encuentran operando equipos o vehículos, se debe detener el equipo en forma inmediata y buscar una zona segura para refugiarse.
- Queda restringido el movimiento de vehículos, izamientos y levantes de materiales y el desplazamiento o tránsito de personas a pie, según sea la velocidad del viento existente.
- Espere instrucciones del jefe turno o Jefe directo.

#### 6.9 Tormentas eléctricas.

- Mantenerse al interior de las instalaciones. Si se encuentra en terreno, refugiarse en algún vehículo, de no haber ubicarse en la explanada más baja.
- De encontrarse dentro de un vehículo, cierre ventanas, bajar la antena radial y apagar la radio, no bajarse del vehículo.
- Alejarse de líneas de alta tensión.
- No salir del área segura hasta no recibir indicaciones del Jefe de área o Administrador.

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## 7. Radios y Teléfonos.

### ▪ Kinross.

| Nombre                   | Teléfono | Radio |
|--------------------------|----------|-------|
| (APR)                    |          |       |
| (Gerente de Operaciones) |          | -     |
| (Representante legal)    |          | -     |
| Organismo Administrador  |          | -     |
| Carabineros              | 133      | -     |
| Bomberos                 | 132      | -     |
| Ambulancia               | 131      | -     |

## 8. Sanciones.

El personal que no cumpla con el presente Plan de Emergencias, serán sancionado de acuerdo a lo establecido en el Reglamento Interno de Orden Higiene y Seguridad de Confinor.

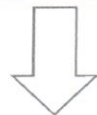
## 9. Modificación del Documento.

Este documento debe revisarse para actualizarlo de acuerdo al desarrollo de las labores y/o cuando se produzcan modificaciones en la legislación.

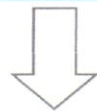
## 10. Anexos.

### 10.1. Diagrama de procesos manejo de incidentes, accidentes.

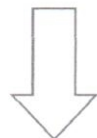
## ACCIDENTE / INCIDENTE



Determinar grado de conciencia

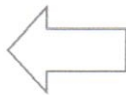


Aplicar técnicas de  
Primeros Auxilios



Solicitar asistencia

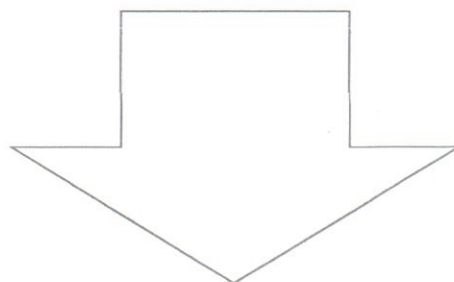
Determinar  
Gravedad de las  
lesiones



Lesiones

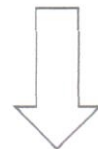


Determinar Grado  
de conciencia



TRASLADAR AL CENTRO ASISTENCIAL MÁS CERCANO

- Informar inmediatamente al Jefe Directo.
- Informar al Encargado del área empresa mandante.



- Informar al Cliente y Asesor en Prevención de riesgos.
- Llenar Declaración Individual de Accidentes del Trabajo (DIAT).
- Coordinar traslado al hospital del Organismo Administrador.
- Realizar informe preliminar de accidentes.

## Anexo C

### **Estimación general de costos acciones PDC.**

Se muestran los ítems contemplados para la estimación del costo total de la implementación de la acción respectiva que se indica:

#### ***Anexo C.1. Cotización prueba geo eléctrica y destructivo depósitos y canchas CMRI de Confinor S.A (Anexo C.1.1)***

#### ***Anexo C.2 Estimación costo Acción 2***

El costo se ha estimado en base a horas de profesional idóneo a un costo de \$20.625 pesos y tiempo necesario para recopilar, solicitar cambios y/o correcciones a los certificados si se requiere, sistematizar, consolidar y subir la información en 4 horas.

Por tanto multiplicando \$20.625 pesos/hora x 4 horas = **\$82.500 pesos**

#### ***Anexo C.3 Estimación costo Acción 3***

El costo representa el total durante el PDC, desglosado según los siguientes ítems mensuales contemplados:

3.1.- Costos de envío por mes= **\$15.000 pesos/mes**

3.2.- Valorización de la toma de muestra por parte de encargado de **\$10.000 pesos/hora** para destinación de 5 horas para la toma y envío de muestras= **\$50.000 pesos/mes**

3.3.- Costo mensual promedio por análisis: **\$2.500.000 pesos/mes**

3.4.- Duración del PDC= **19 meses**

Por tanto, multiplicando (\$15.000 pesos + \$50.000 pesos + 2.500.000 pesos)/mes x 19 meses = **\$48.735.000 pesos**



#### ***Anexo C.4 Estimación costo Acción 4***

Se contempla un costo total resultado de la valorización del tiempo que toma el análisis y consolidación del informe, ingreso en plataforma y sistematización de la información disponible

A un valor hora de **\$20.625** y **4 horas/mes** por **19 meses** de duración del PDC.

Por tanto multiplicando **\$20.625 pesos/hora x 4 horas x 19 meses = \$1.567.500 pesos**

#### ***Anexo C.5 Estimación costo Acción 5***

En este costo se ha contemplado la suma de costo de los siguientes ítems:

- 5.1.- Costo desarrollo de link= \$330.120 (**Anexo C.5.2**)
- 5.2.- Costo estimado de ingreso mensual de información/mes= \$60.000/mes
- 5.3.- Costo estimado de mantención anual link/año= \$100.000

Por tanto multiplicando (\$60.000 pesos/mes x 19 meses) y sumándole (\$330.120 pesos + \$200.000 pesos)= **\$1.670.120 pesos**

#### ***Anexo C.6 Estimación costo Acción 6***

Estimación del Costo total durante la ejecución del PDC que contempla los siguientes ítems:

- 6.1.-Valorización del desarrollo de procedimiento de toma de muestras para medir pH con personal propio (\$15.000 pesos por hora x 30 horas desarrollo procedimiento)= **\$450.000**
- 6.2.- Valorización capacitación, con personal propio, procedimiento para toma de muestras y medición pH= 4 horas x \$15.000 hh= **\$60.000 pesos**

Sumando \$450.000 + \$60.000= **\$510.000 pesos**



### ***Anexo C.7 Estimación costo Acción 7***

Costo total por el tiempo de ejecución del PDC que contempla el siguiente ítem.

7.1.- Valorización de tiempo para toma de muestras y medición pH= 4 horas x 10.000 hh x 4 semanas= **\$160.000 pesos/mes**

7.2.- Compra equipos pH=**\$674.000**

***No se incluye costos de capacitación ya contemplado en acción nº6***

Siendo así y multiplicando \$160.000 pesos/mes por 19 meses y sumándole el costo de los 2 equipos de pH de \$674.000=**\$3.714.000 pesos**

### ***Anexo C.8 Estimación costo Acción 8***

Dado que es una acción eventual y asociada a las toneladas de residuo con inconsistencias durante la ejecución del PDC y la imposibilidad de establecer a priori un costo asociado, se expresa un costo por tonelada de residuo rechazado.

Dicho valor unitario contempla el costo estimado de disposición final por tonelada de residuo en prestador autorizado igual a **\$137.550** pesos aproximadamente y de transporte/flete de **\$25.000** pesos por tonelada (costo flete de \$700.000 pesos dentro de la región de atacama, en camión con rampla de 28 toneladas de capacidad)

Ambos de cargo del titular del presente PDC en caso que la autoridad defina su envío a prestador autorizado.

### ***Anexo C.9 Estimación costo Acción 9***

Se estima costo total en base a 9 muestras enviadas a laboratorio acreditado según cotización adjunta (**Anexo C.9.3**)

### ***Anexo C.10 Estimación costo Acción 10***

El costo se ha estimado en base a una hora de profesional idóneo, a un costo de \$20.625 pesos, y tiempo necesario para recopilar, solicitar cambios y/o correcciones, si se requiere, sistematizar, consolidar y subir la información en 4 horas.

Por tanto multiplicando \$20.625 pesos/hora x 4 horas = **\$82.500 pesos**

### ***Anexo C.11 Estimación costo Acción 12***

El costo representa el total durante el PDC desglosado según los siguientes ítems contemplados

12.1.- Valorización de la verificación y registro de hallazgos por parte de encargado igual a \$10.000 pesos/hora. Destinación de 1 horas/día= \$10.000 pesos x 20/días mes= **\$200.000/mes**

12.2.- Duración del PDC= **19 meses**

Por tanto multiplicando \$200.000 pesos/mes x 19 meses = **\$3.800.000 pesos**

### ***Anexo C.12 Estimación costo Acción 13***

El costo representa el total durante el PDC desglosado según los siguientes ítems contemplados

13.1.- Valorización de la recopilación, ordenamiento e ingreso de la información en la plataforma igual a \$10.000 pesos/hora. Destinación de 4 horas/día al mes= \$40.000 pesos/mes

13.2.- Duración del PDC= **19 meses**

Por tanto multiplicando \$40.000 pesos/mes x 19 meses = **\$760.000 pesos**

### ***Anexo C.13 Estimación costo Acción 14***

El costo se ha estimado en base a horas de profesional idóneo a un costo de \$20.625 pesos/hora y el tiempo necesario para recopilar, sistematizar y consolidar la información en un plazo de 10 días a 8 horas/día.

Dadas las características de la acción no se han considerado costos asociados a eventuales requerimientos exigidos por la autoridad, luego del examen de los antecedentes entregados.

Por tanto multiplicando \$20.625 pesos/hora x 8 horas/día x 10 días = ***\$1.650.000 pesos***

### ***Anexo C.14 Estimación costo Acción 15***

#### **Costo total que contempla**

- Estudio de replanteo (***Anexo C.14.4***)=

***\$450.000 pesos***

- Estimación movimiento de tierra, materiales y maquinaria en base a información propia=

***\$79.250.000 pesos***

- Insumos de impermeabilización.
- Insumos de impermeabilización (cierre insumos y mano de obra).
- Instalación de geosintéticos
- Arriendos
- Ensayos
- Movimiento de tierra (Desarme y traslado)
- Movimiento de tierra (Construcción)

***Total de \$79.700.000***

### ***Anexo C.15 Estimación costo Acción 16***

Estimado en base al movimiento de tierra (maquinaria y combustible) adicional requerido para aumentar al doble la última capa de cobertura necesaria para habilitar área, nivelación topográfica, señaléticas requeridas (M\$2.916) y cierre perimetral (M\$6.530).

Sumando se tiene =  $\$2.916.000 + \$6.530.000 = \$9.446.000$

### ***Anexo C.16 Estimación costo Acción 18***

Sólo se contempla el costo estimado de traslado (combustible y hora máquina) hasta área de disposición transitoria, de la totalidad de residuos existentes en cancha 1 y 2.

La disposición final no se considera ya que forma parte de las actividades rutinarias del CMRI que se desarrollan de igual forma.

En caso de disponer fuera del CMRI por mandato de la autoridad en caso de inconsistencias, estos costos han sido contemplados en la acción N°8

### ***Anexo C.17 Factura de curso de brigada de emergencia (Anexo C.17.5)***

### ***Anexo C.18 Estimación costo Acción 21***

Costo estimado en base a la elaboración de un curso anual (16 horas) y la respectiva capacitación (8 horas), con personal propio, a un costo hora de profesional idóneo de \$20.625/hora a realizar en dos oportunidades en función de la extensión del PDC.

Por tanto multiplicando  $\$20.625 \text{ pesos/hora} \times 24 \text{ horas} \times 2 = \$990.000 \text{ pesos}$

### ***Anexo C.19 Estimación costo Acción 22***

Se expresa el valor unitario de capacitación por trabajador, dado que la acción es eventual y dependiente exclusivamente del ingreso de nuevos trabajadores durante el PDC.

El costo se ha estimado en base a la elaboración de una capacitación de 4 horas con personal propio, a un costo hora de profesional idóneo de \$20.625/hora a realizar en dos oportunidades en función de la extensión del PDC.

*Anexos*



### **Anexo C.1.1: Cotización prueba geoelectrica y destructivas**



## SOLPLAS Y CIA LTDA

Servicios y Asesorías  
Soluciones de Impermeabilización  
Reparación, Mantenimiento  
y Arriendo de Equipos de Termofusión  
email: contacto@stithermoservice.cl  
email: stithermoservice@gmail.com

### DETECCION ELECTROMAGNETICA Y PRUEBAS DESTRUCTIVAS COTIZACION N°021018

LUGAR : COPIAPO  
SEÑORES : CONFINOR S.A  
DIRECCIÓN : COPIAPO  
ATT.SR. : Mayed Llarlluri  
E-MAIL :  
FECHA : 02 de Octubre 2018  
RUT :  
FONO :  
FAX :

De nuestra consideración  
Detallamos a continuación la siguiente cotización

| ITEM | CANT. | UNIDAD | DESCRIPCION                                                        | P.UNITARIO | TOTAL        |
|------|-------|--------|--------------------------------------------------------------------|------------|--------------|
| 1    | 3     | m2     | Detección geoelectrica en geomembrana HDPE 1,5mm dep 8,6,5         | \$ 490,000 | \$ 1,470,000 |
| 2    | 2     | m2     | Detección geoelectrica en geomembrana HDPE 1,5mm cancha acopio 1y2 | \$ 490,000 | \$ 980,000   |
| 3    | 12    | ml     | Inspeccion y pruebas de tensionamiento en calicatas                | \$ 102,850 | \$ 1,234,200 |
| 4    | 1     | gl     | Informe tecnico de resultados según normas ASTM geosinteticos      | \$ 750,000 | \$ 750,000   |
|      |       |        |                                                                    | NETO       | \$ 4,434,200 |
|      |       |        |                                                                    | IVA        | \$ 842,498   |
|      |       |        |                                                                    | TOTAL NETO | \$ 5,276,698 |

Valor de la oferta : 05 dias  
Forma de pago : 40% contado saldo contra Factura

|      |                                          |         |
|------|------------------------------------------|---------|
| NOTA | OFERTA CONTEMPLA UNA DURACION DE ENTREGA | 20 dias |
|------|------------------------------------------|---------|

#### **Anexo C.5.2: Cotización link acceso autoridad**



## Presupuesto

Desarrollo a la medida: **Sistema “Acceso autoridad Sanitaria”**

**At. Nury Llarlluri Sukni**

**[www.confinorsa.cl](http://www.confinorsa.cl)**

10/10/2018



**Webmanager Ltda.**

Av. Pedro de Valdivia 555 Of 315

Providencia, Santiago - Chile

Sitio web: **[www.webmanager.cl](http://www.webmanager.cl)**

**Valeria Luco**

**Área Comercial**

Fono: +56 2 23430917

E-mail: [clientes@webmanager.cl](mailto:clientes@webmanager.cl)

# Diseño y desarrollo de nueva sección para ser habilitada en sitio web [www.confinorsa.cl](http://www.confinorsa.cl)

## “Acceso autoridad Sanitaria”

**Precio: UF 12 + IVA / Pago único**

Servicio de diseño y desarrollo de nueva sección para sitio web :

Acceso autoridad Sanitaria: Permitirá acceder para visualizar y descargar documentos PDF.

Incluye Claves de Acceso.

Con el CMS podrá administrar la sección.

### Etapas del Proyecto:

|           |                               |
|-----------|-------------------------------|
| Etapa I   | Levantamiento de información. |
| Etapa II  | Diseño de Maqueta.            |
| Etapa III | Desarrollo.                   |
| Etapa IV  | Producción.                   |

### Plazos de Entrega:

6 días hábiles para el desarrollo de la Maqueta de Diseño.

6 días hábiles para el desarrollo si se cuenta con todo el material para realizar el poblamiento: Textos + Imágenes + adjuntos.



**El servicio profesional de  
diseño de un sitio web  
incluye:**

Asesoría, programación,  
desarrollo y habilitación,  
se entrega 100% operativo  
y el diseño es a la medida.



## Condiciones Generales

### Requerimientos:

**Acceso al servidor:** Si el cliente provee el webhosting se requiere las claves de acceso al Cpanel o FTP y 1 Base de Datos de servidor con sistema operativo Linux y base de Datos MySQL server.

**Requerimientos:** Logo(s), Textos, imágenes, adjuntos, folletos, videos, etc. en resumen, todo el material que desea se integre a la sección nueva.

### Forma de Pago:

50% contra aprobación de presupuesto.

50% contra entrega dado el VºBº del cliente.

### Validez del presupuesto:

10 días corridos.

### \*Garantía:

1 mes a contar de la fecha en que el sitio es subido a la red Internet y/o entregada las claves de acceso al CMS, esta garantía considera cualquier falla o irregularidad de funcionamiento y es aplicable al producto tal y como se entrega al cliente dado su VºBº.

Las modificaciones que el propio cliente realice en el código fuente, o elimine carpetas o páginas, o cambie estructuras, invalidan esta garantía.

Una vez finalizado el período, el cliente podrá solicitar los servicios que **WebManager** brinda: mantención de sitio web, community manager, marketing digital, posicionamiento SEO y más previa aprobación de presupuesto.

### Continuidad del Proyecto:

Si el cliente no proporciona el material necesario para poder iniciar, avanzar y/o terminar el proyecto, se le dará aviso vía e-mail para que los proporcione, si después de este aviso pasan más de 30 días corridos, por el servicio de reactivación del proyecto se facturará UF 2 factura exenta adicionales al presupuesto, lo anterior es debido a que la implicancia de retomar un proyecto web requiere volver a introducirse en este y como consecuencia, destinar HH (horas hombre) no contempladas en este presupuesto.



## Servicios estratégicos para su negocio



[www.webmanager.cl](http://www.webmanager.cl)

18 años entregando soluciones digitales de excelencia



**Webmanager Ltda.**

Av. Pedro de Valdivia 555 Of 315  
Providencia, Santiago - Chile  
Sitio web: [www.webmanager.cl](http://www.webmanager.cl)

**Área Comercial**

Fono: +56 2 23430917  
E-mail: [info@webmanager.cl](mailto:info@webmanager.cl)

**ORDEN DE COMPRA N° 2869**



| Fecha de Emisión<br>10 de octubre de 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  | Válida Hasta           |         | SANTIAGO                                                                                                                                                                       |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|--|------------------|----|------|------------------|----|---|-------------|----|------|----------------|----|--------|--------------|----|---------|
| <b>Comprador</b> : CONFINOR S.A.<br><b>Giro</b> : C.M.R.I.<br><b>Rut</b> : 76.851.740-1<br><b>Dirección</b> : Mariano Sánchez Fontecilla 548-B, Las Con                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                        |         | <b>Razón Social</b> : SERV. PUB. WEBMANAGER LTDA.<br><b>Giro</b> : PUBLICIDAD Y DESARROLLO<br><b>Rut</b> : 77.425.850-7<br><b>Dirección</b> : AV.PEDRO DE VALDIVIA 555 OF. 315 |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
| Condiciones de Pago<br>CONTADO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  | Condiciones de Entrega |         | Vía de Transporte                                                                                                                                                              |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
| SIRVANSE ACEPTAR NUESTRA ORDEN DE COMPRA POR LOS SIGUIENTES EQUIPOS O MATERIALES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
| Solicitud                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Código del ítem  | Cant.                  | Unid    | Descripción de los ítems                                                                                                                                                       | Precio Unitario | Precio Total |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  | 1                      | GL      | SISTEMA "ACCESO AUTORIDAD SANITARIA"                                                                                                                                           | 12UF            | 12UF         |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         | SU PRESUPUESTO DE FECHA 10/10/2018                                                                                                                                             |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |         |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
| <p align="center"><b>Nota estos valores no incluyen IVA</b></p> <table border="1"> <tr> <td rowspan="5"></td> <td align="right"><b>Sub Total</b></td> <td align="right">\$</td> <td align="right">12UF</td> </tr> <tr> <td align="right"><b>Descuento</b></td> <td align="right">\$</td> <td align="right">0</td> </tr> <tr> <td align="right"><b>Neto</b></td> <td align="right">\$</td> <td align="right">12UF</td> </tr> <tr> <td align="right"><b>19% IVA</b></td> <td align="right">\$</td> <td align="right">2,28UF</td> </tr> <tr> <td align="right"><b>TOTAL</b></td> <td align="right">\$</td> <td align="right">14,28UF</td> </tr> </table> |                  |                        |         |                                                                                                                                                                                |                 |              |  | <b>Sub Total</b> | \$ | 12UF | <b>Descuento</b> | \$ | 0 | <b>Neto</b> | \$ | 12UF | <b>19% IVA</b> | \$ | 2,28UF | <b>TOTAL</b> | \$ | 14,28UF |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Sub Total</b> | \$                     | 12UF    |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Descuento</b> | \$                     | 0       |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Neto</b>      | \$                     | 12UF    |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>19% IVA</b>   | \$                     | 2,28UF  |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>TOTAL</b>     | \$                     | 14,28UF |                                                                                                                                                                                |                 |              |  |                  |    |      |                  |    |   |             |    |      |                |    |        |              |    |         |

### **Anexo C.9.3: Cotización caracterización peligrosidad**



## COTIZACION N° SQC - 384130 / 2018

**CESMEC**

**A : CONFINOR S.A.**

Fecha: 02-10-2018

At.Sr(a): MARIANA CARRASCO

Fono: 979762396/27528116

De nuestra consideración:

De acuerdo a su solicitud, tenemos el agrado de hacerles llegar nuestra cotización por los siguientes servicios:

| Cant.                                              |                                                                                                                                      | Valor<br>Unit.Net | Precio          |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|
| <b>Servicio de Análisis Químico, según DS 148.</b> |                                                                                                                                      |                   |                 |
| 8                                                  | RESIDUO - Test de Lixiviación (TCLP) (*) Inorgánico Incluye: As, Hg, Cr, Pb, Se, Ba, Ag y Cd<br>Método: EPA 1311                     | UF                | 4,0000          |
| 8                                                  | RESIDUO - Test de Lixiviación (TCLP) Orgánico Incluye: Compuestos Volátiles y Semivolátiles<br>Método: EPA 1311                      | UF                | 9,8000          |
| 8                                                  | RESIDUO - Test de Inflamabilidad<br>Método: EPA 1010 ó 1030                                                                          | UF                | 1,5800          |
| 8                                                  | RESIDUO - Test de Corrosividad<br>Método: EPA 1110-A                                                                                 | UF                | 3,3700          |
| 8                                                  | RESIDUO - Test de Reactividad<br>Incluye: Acido Cianhídrico y Sulfhídrico<br>Método: EPA 9014 y 9034                                 | UF                | 2,6000          |
| 8                                                  | RESIDUO - Análisis de PCB's (Cuantificación de Aroclor 1242-1254-1260)<br>Método: ASTM D 4059 / Cromatografía Gaseosa - Detector ECD | UF                | 4,0000          |
| <b>Sub-Total (NETO)</b>                            |                                                                                                                                      | <b>UF</b>         | <b>202,8000</b> |
| <b>Menos 10% de descuento:</b>                     |                                                                                                                                      | <b>UF</b>         | <b>20,2800</b>  |
| <b>Total (NETO)</b>                                |                                                                                                                                      | <b>UF</b>         | <b>182,5200</b> |
| <b>19 % IVA</b>                                    |                                                                                                                                      | <b>UF</b>         | <b>34,6788</b>  |
| <b>TOTAL</b>                                       |                                                                                                                                      | <b>UF</b>         | <b>217,1988</b> |

### NOTAS IMPORTANTES DEL SERVICIO.

• Para consulta de resultados, favor comunicarse con Supervisor de Área, Srta. Maria Leiva, al email [maria.leiva@bureauveritas.cl](mailto:maria.leiva@bureauveritas.cl) o al fono 23502100 anexo 9217.

• Tiempo de respuesta: 15 días hábiles.

• Tipo de muestras: Residuo.

m-1 Yeso de neutralizacion  
m-2 Tierra contaminada /copelas  
m-3 Filtros usados/cartn contaminado  
m-4 Textiles contaminado/guante usado

m-1 Yeso de nueutralizacion  
m-2 Textil y absoeventes contaminados  
m-3 EPP Usados contaminados  
m-4 Grasa usada

• Cantidad de Muestra requerida: 1 a 2 Kg. envase de vidrio, tipo conservero.

• En caso de que el informe de este servicio, sea solicitado para ser presentado ante la autoridad o un tercero que cuestione la procedencia de la muestra, u objete el informe por no poder respaldar su origen, se recomienda solicitar este servicio con Toma de Muestra por parte de nuestro laboratorio. De requerir lo mencionado favor comunicarlo para incorporar este ítem en la presente cotización.

**Vea nuestros Servicios y Acreditaciones en página WEB [www.bureauveritas.com](http://www.bureauveritas.com) / [www.cesmec.cl](http://www.cesmec.cl)**

**Casa Matriz : Avda. Marathón 2595 - Macul - Santiago - Chile Fono 56- 2- 2350 21 00**

**BUREAU VERITAS - CESMEC - GEOANALITICA - INSPECTORATE - ANDES CONTROL - ACME - ECA**



**CESMEC**

## COTIZACION N° SQC - 384130 / 2018

- Ensayo subcontratado.
- La presente cotización detalla valores unitarios, por lo que si se generará mas de una muestra, estas deben multiplicarse por el valor total de ellas.
- Cesmec S.A., cuenta con la acreditación por parte del INN (NCH 17025) además de la autorización como Laboratorio Privado de Salud Pública de Caracterización de Residuos Peligrosos por parte del Ministerio de Salud, para realizar este tipo de ensayos.
- Si la muestra es entregada por el solicitante, el informe de Análisis contendrá la siguiente Nota: "Los resultados obtenidos son válidos sólo para las muestras analizadas, las cuales fueron identificadas y proporcionadas por el solicitante".
- Si la cotización es aceptada, indique por escrito el número de ésta al solicitar el servicio y en toda la documentación que envíe.
- Un residuo tendrá la característica de corrosividad si presenta alguna de las siguientes propiedades:
  - a) Es acuoso y tiene un pH inferior o igual a 2 o mayor o igual a 12,5;
  - b) Corroe el acero (SAE 1020) a una tasa mayor de 6,35 mm por año, a una temperatura de 55 °C según el Método de la Tasa de Corrosión.

El ensayo de la Tasa de Corrosión es realizado según método EPA 1110 A. Este método se utiliza para determinar la corrosividad en muestras sólidas, que es capaz de producir un desecho bajo determinadas condiciones. La corrosión se determina sobre una muestra de acero.

- En caso de solicitar reenvío, separación o copias de informes, no informadas al momento del inicio del servicio, y ya concluido el proceso, la gestión de estos tendrá un costo asociado de 1 UF + IVA. Esta gestión quedará condicionada a que exista la factibilidad viable por parte del área operativa del laboratorio el cual tendrá un tiempo de respuesta no mayor a 48 hrs.

### **NOTAS COMERCIALES.**

- **Condición de Pago: 30 días fecha Factura**
- LOS VALORES INDICADOS SON NETOS Y NO INCLUYEN EL IVA, POR LO CUAL DEBE AGREGARLO EN EL MONTO TOTAL DE LA FACTURA.
- Para la conversión a pesos, se considerará el valor de la UF del día de la facturación.
- Entrega y retiro de la(s) muestra(s) debe ser en Avda. Marathón # 2595; Macul, Santiago.
- Vigencia del Precio: 30 días.

**El monto total cotizado estará afecto a un 10% de descuento, al contar con su preferencia.**

*Si nos favorece con su aceptación, por favor avisarnos si no están correctos los siguientes datos que tenemos de su empresa:*

RUT : 76851740-1

Dirección de Facturación : MARIANO SANCHEZ FONTECILLA 548-B - LAS CONDES

Dirección de Despacho : JUAN SEBASTIAN BACH 236 - SAN JOAQUIN

Acceda a las Condiciones Generales de los servicios de CESMEC que son parte integrante de esta cotización en sitio

<http://www.bureauveritas.cl/01156164-783c-4a9f-97c5-91128abe78c1/Condiciones%2BGenerales%2Bde%2Bservicio%2BBV.pdf?MOD=AJPERES>

Esperando que la presente sea de su conveniencia, le saluda cordialmente,

Robinson Fuentes R.  
Minerals Commercial Area

Telefono(s): 2-23502100- Anexo 9206



## COTIZACION N° SQC - 384130 / 2018

**CESMEC**

### Aceptación de Cotización

Acepto Precio, Notas de la Cotización y Condiciones Generales de los servicios de Cesmec S.A., para proceder a envío de Orden de Compra .../ Contrato..... / otro....., a nombre de Cesmec S.A., RUT: 81.185.000-4 :

Nombre: ..... Rut: .....

Cargo:.....

(con autoridad para aceptar cotizaciones en nombre de la empresa)

Firma



#### **Anexo C.14.4: Cotización replanteo**

A: Sr. Cesar Reinoso

Copiapó 10 Dic 2018

Confinor

De: Reinaldo Ildefonso

***Ildefonso Topografía***

Ref. presupuesto topográfico por levantamiento topográfico de vértices.

#### **PERSONAL PARTICIPANTE**

\_ 01 Topógrafo

\_ 01 Asistente

#### **INSTRUMENTAL Y EQUIPOS**

\_ GPS.

\_ Estación Total.

\_ Movilización.

#### **DESCRIPCION DE LOS TRABAJOS**

Se realizará levantamiento topográfico de 4 vértices en terreno y se comparará con coordenadas de proyecto.

## **VALOR DE LOS TRABAJOS**

El valor de los trabajos es de **\$ 450.000** pesos, valor neto.

***El valor no incluye el 10% boleta de honorarios.***

Sin otro particular se despide atentamente de Ud.

**Reinaldo Ildefonso Estay**

**Topógrafo**

**Run: 12.348.983-7**

**Fono 976872599**

#### **Anexo C.1.1: Factura cobro capacitación brigada**

**RICARDO MIGUEL PIZARRO BAEZ**

Giro: VTA RECARGA MANT Y REPARACION EXT  
Y CAPACITACION

VALLEJOS 240 CENTRO- COPIAPO

eMail : EXT.COMBATFIRE@GMAIL.COM Telefono :  
82714136

R.U.T.:7.733.368- 1

**FACTURA ELECTRONICA**

**Nº1673**

**S.I.I. - COPIAPO**

TIPO DE VENTA: DEL GIRO

Fecha Emision: 14 de Septiembre del 2018

SEÑOR(ES): CONFINOR S.A.  
R.U.T.: 76.851.740- 1  
GIRO: VENTA AL POR MAYOR DE METALES Y MINERALE  
DIRECCION: CAMINO C-404 SECTOR LLANO C-404 SECTOR LLANO  
SECO  
COMUNA COPIAPO CIUDAD: COPIAPO  
CONTACTO:  
TIPO DE  
COMPRA: DEL GIRO

| Codigo | Descripcion           | Cantidad | Precio    | %Impto<br>Adic.* | %Desc. | Valor     |
|--------|-----------------------|----------|-----------|------------------|--------|-----------|
| -      | Curso Form Brig Emerg | 1        | 2.200.000 |                  |        | 2.200.000 |

Forma de Pago:Contado



Timbre Electrónico SII

Res.99 de 2014 Verifique documento: [www.sii.cl](http://www.sii.cl)

|                    |    |           |
|--------------------|----|-----------|
| MONTO NETO         | \$ | 2.200.000 |
| I.V.A. 19%         | \$ | 418.000   |
| IMPUESTO ADICIONAL | \$ | 0         |
| TOTAL              | \$ | 2.618.000 |