Ministerio
de Ambiente

JICA
Agencia de Cooperación Internacional del Japón

“ JICA
Clean City Initiative ”
—
For Human Security, Quality Growth and Global Environment
“Technical Cooperation URUGUAY / JAPAN
JICA
WATER QUALITY – Santa Lucía River (2003 – 2011)” and
MERCURY IN SEDIMENTS (2015 – 2017)”

January 2022
Ministry of Environment – Environment Quality Division - Eng.Luis Reolon

Uruguay – Japan Cooperation cronology:

- The Oriental Republic of Uruguay is a country with a total area of about 176,000 km2, and a population of near 3.3 million people. Although the population density is low, near its 60% is concentrated in Santa Lucía River basin, the main drinking water source of the Capital city Montevideo and its metropolitan area with 1.4 million people.
- Consequently, there is a problem of fundamental importance socially, environmentally and economically, due to the pollution of the water in the Santa Lucia River. Point sources of pollution include city water, wastewater from industrial activity, while diffuse sources correspond to runoff from land used for agriculture and dairy livestock. Mercury pollution has also been registered in very limited places.

- In order to control pollution, Uruguay has been implementing for many years, several measures like the construction of sanitation systems and the control of wastewater from industrial origin.
- However, these efforts were isolated and insufficient, and pollution (mainly by nutrients) continued growing, requiring a more integrated Plan to address this growing problem in the Santa Lucia River.

- **In these circumstances, the Government of Uruguay requests technical cooperation from the Government of Japan, through the Japan International Cooperation Agency (JICA). This is concreated between October 2003 and January 2007, with the Development Study »Project about Capacity Development for the Management of Water Quality in Montevideo and its Metropolitan Area« .**
- After the Preparatory Studies of JICA in November 2007, **both governments agreed to implement a new technical cooperation project, the »Project about the Pollution Control and Management of Water Quality in Santa Lucia River Basin « This cooperation project began in March 2008 and ended in March 2011.**

- The results of this JICA cooperation (Uruguay Japan) led, among other things, to the development of an Action Plan (March 2013) designed and operated entirely by the current Ministry of Environment of Uruguay (July 2020), thanks to the technical knowledge acquired under the JICA cooperation“
- **The presentation will show the results of JICA cooperation (Uruguay – Japan), the experience transferred to Uruguay and the results of the cooperation that were transferred to other countries.**

National Environment Directorate

PROJECT FOR "WATER POLLUTION CONTROL AND MANAGEMENT OF WATER QUALITY IN SANTA LUCIA RIVER BASIN"

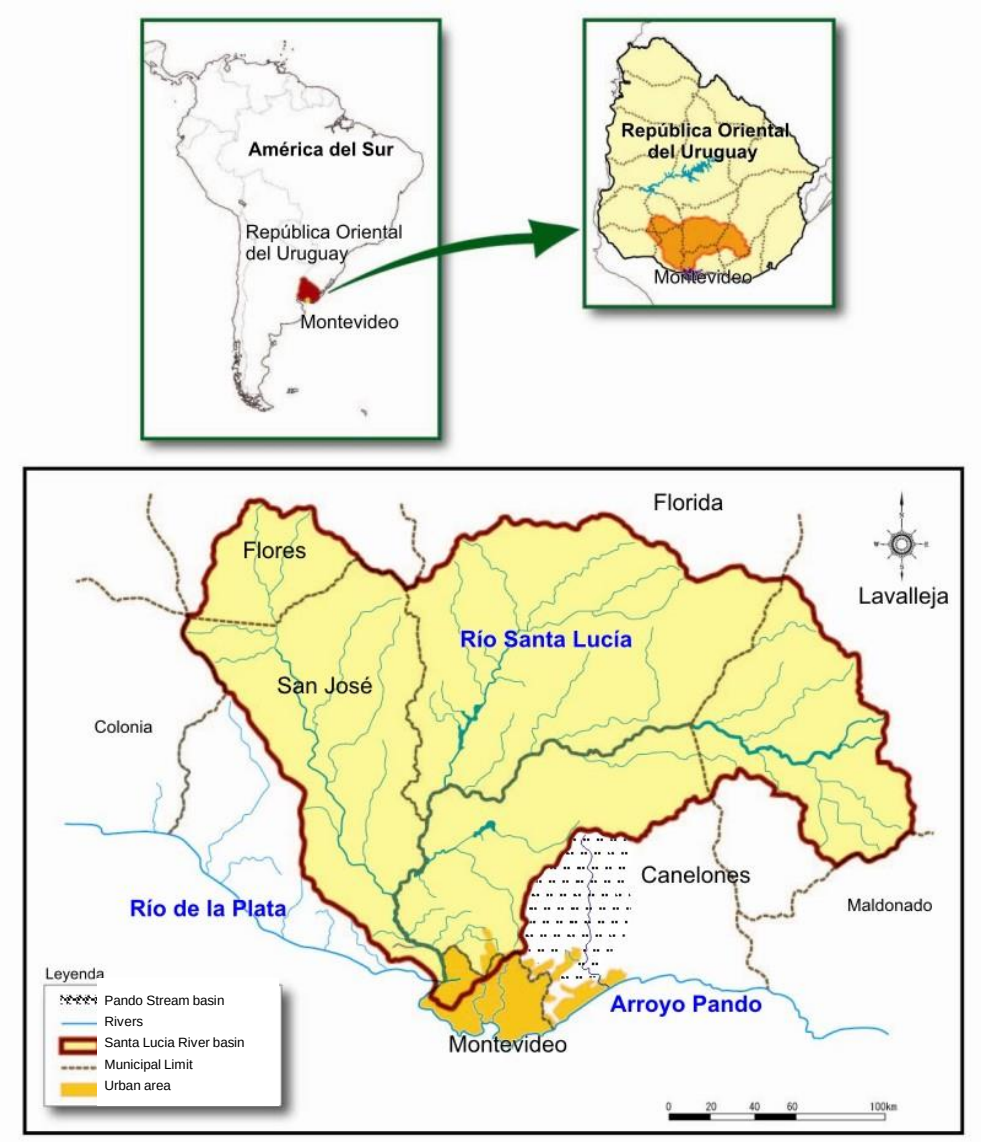
PROJECT GENERAL PROFILE

February 24, 2011

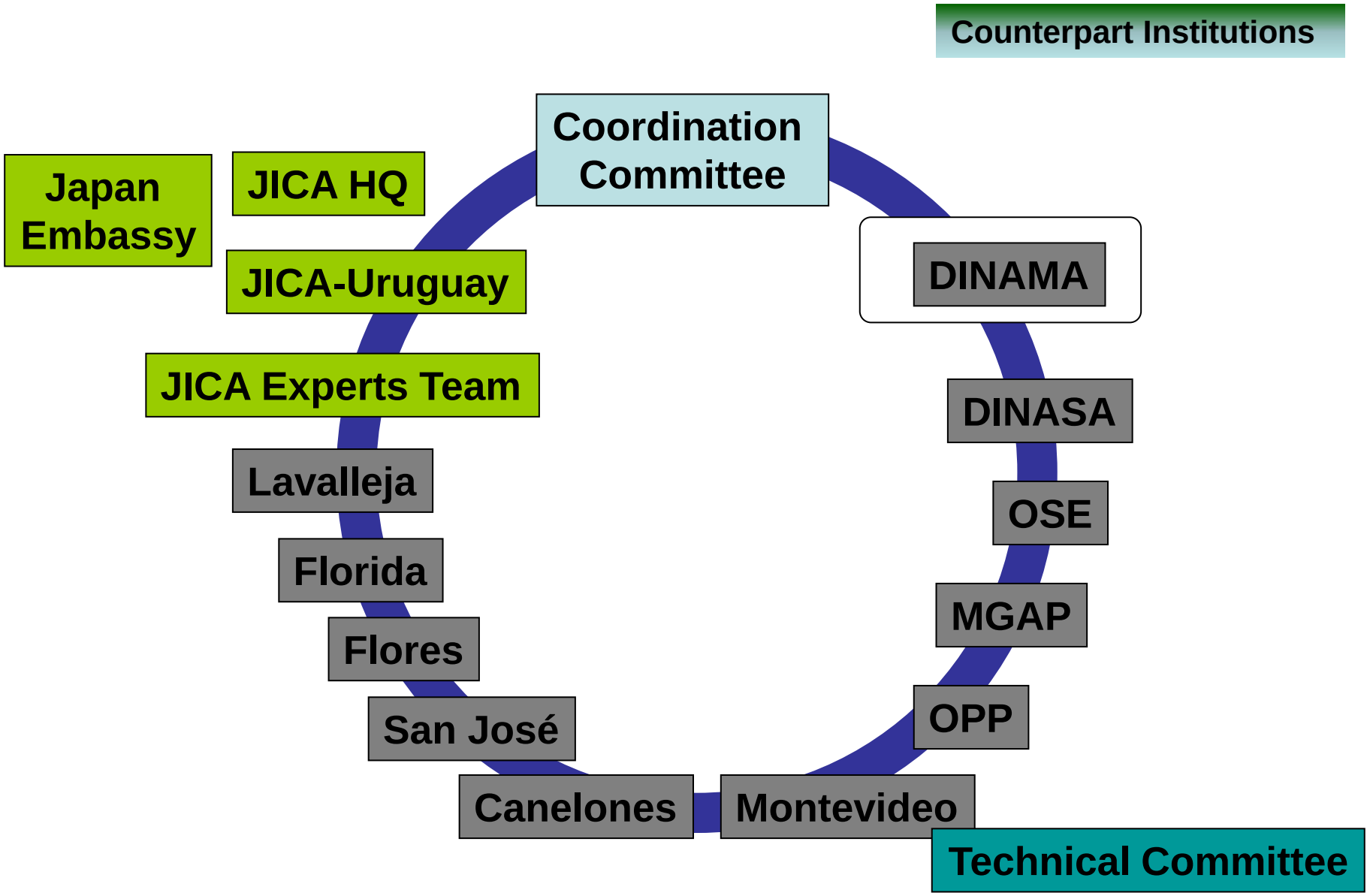
Eng. Luis Reolon

luis.reolon@dinama.gub.uy

Project Area



Project Organizational Structure



Project Design

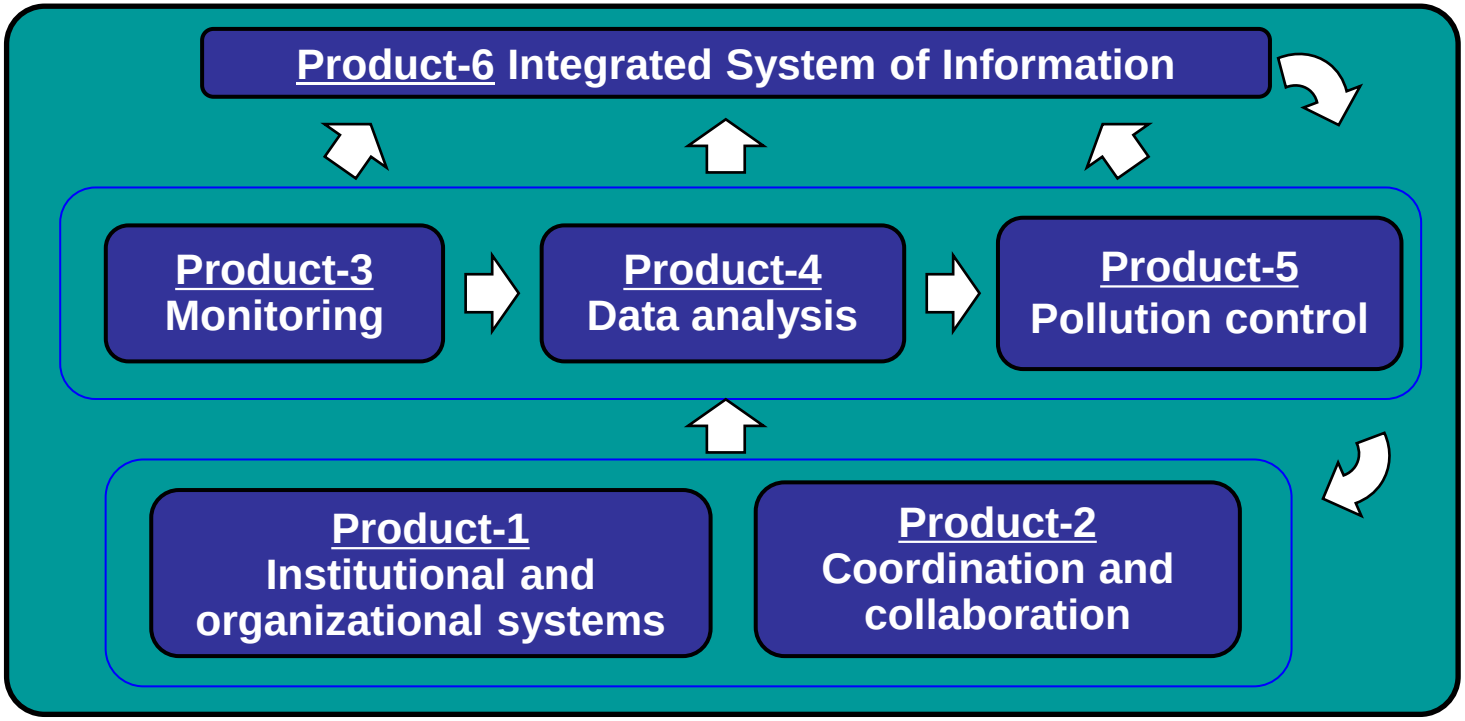
General Aim

- Implement measures to improve water quality in Santa Lucía River basin.
- Promote the control of pollution sources and the management of water quality in a similar way as in other basins

Project Purpose

- Strengthening the capacity of DINAMA and other organizations for the control of water pollution sources and the management of water quality in Santa Lucía River basin

Project Products



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The Japanese experience transferred to Uruguay

“ JICA

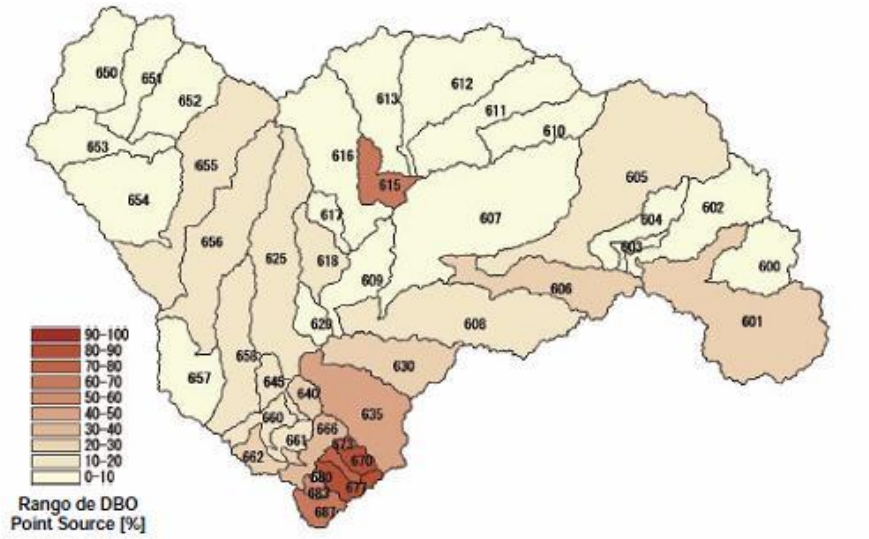
Clean City Initiative ”

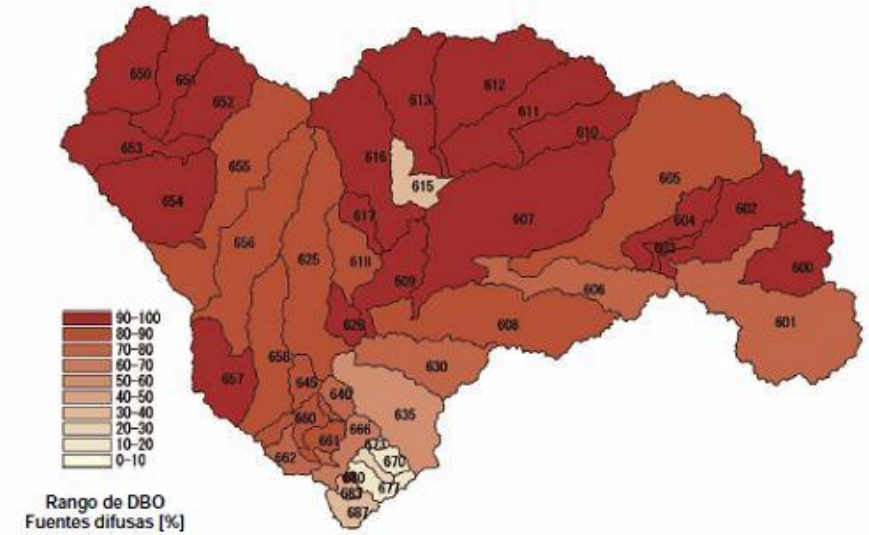
SANTA LUCÍA RIVER

AMBIENT WATER QUALITY

Actual Situation

Santa Lucía River – BACKGROUNDS – JICA – DINAMA STUDY (2008 – 2011)





Fuente: DINAMA y JET

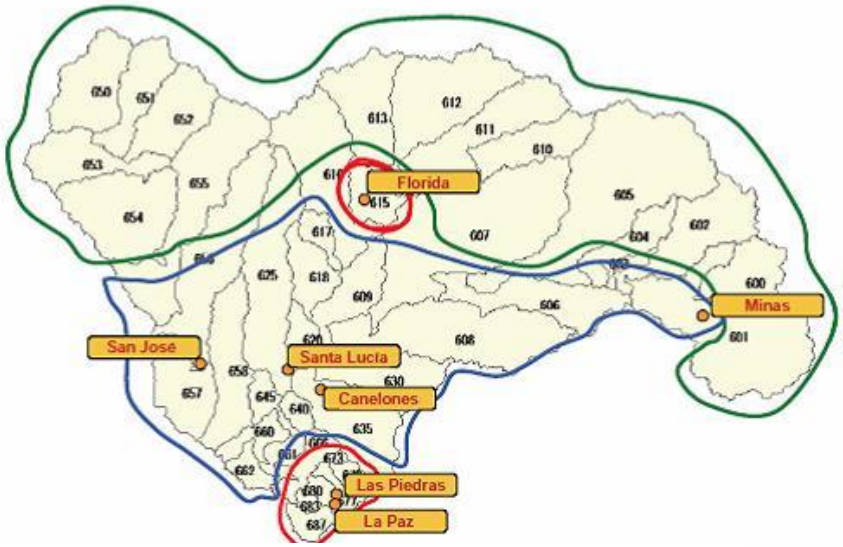
Figura 2-18 Relación de cargas de DBO de origen puntual y difuso a nivel de subcuenca (arriba: fuentes puntuales, abajo: fuentes difusas)

AMBIENT WATER QUALITY
Actual Situation
Santa Lucía River – BACKGROUNDS – JICA – DINAMA STUDY (2008 – 2011)

Table 2-17 Zones with different pollution characteristics

Zones	Colors in the graph	Pollution sources to control
Upstream	Green	Diffuse sources
Central zone of basin	Blue	Diffuse sources in rural areas and point sources in urban areas
Florida and downstream zone	Red	Point pollution sources like factories and household wastewater

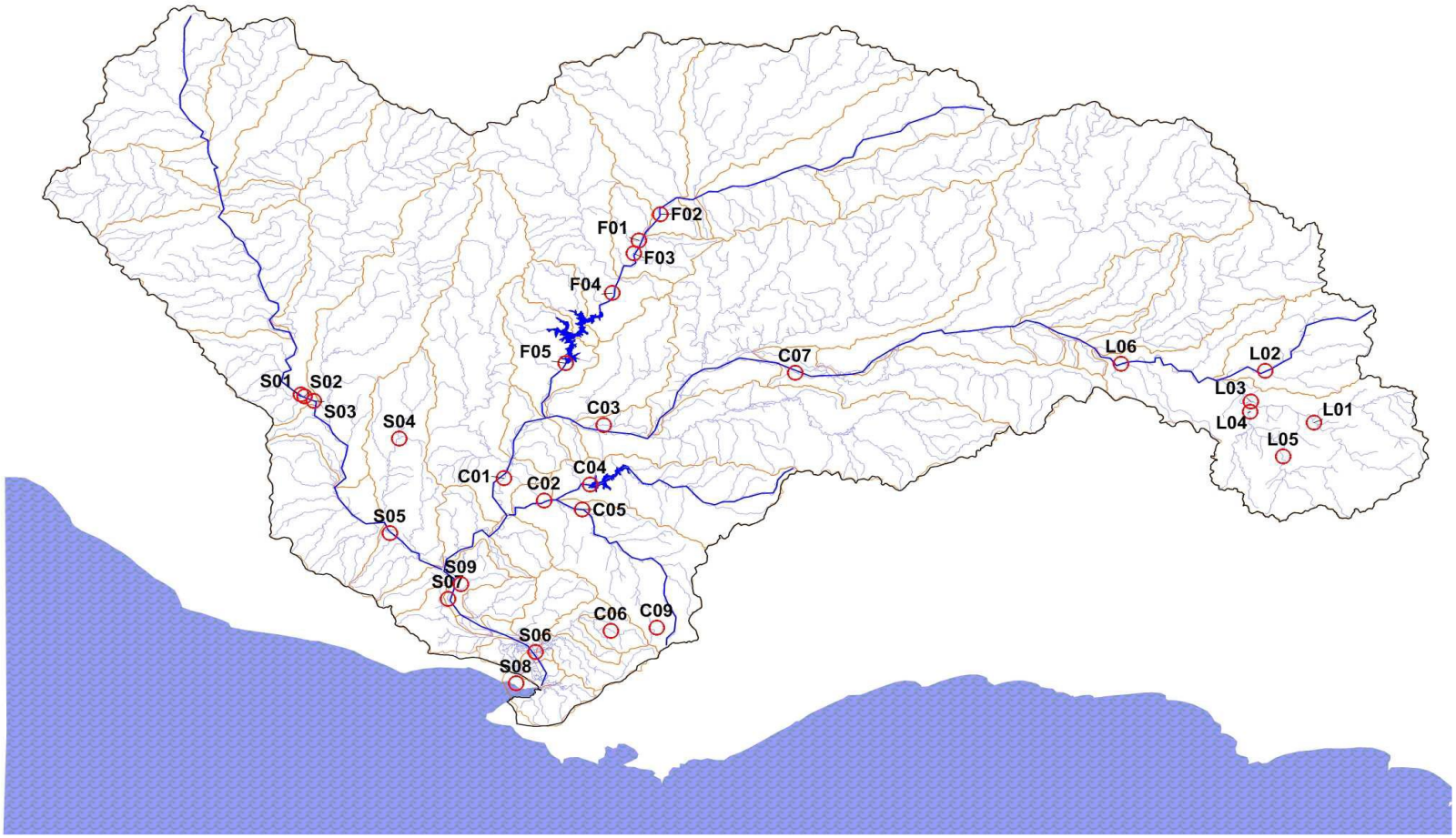
Source: DINAMA and JET



Source DINAMA and JET:

Figure 2-19 Areas of pollution sources to control

MONITORING PROGRAM



Ministerio de Ambiente

MVOTMA
Ministerio de Vivienda Ordenamiento Territorial y Medio Ambiente

Santa Lucía River
Watershed

Action Plan for the protection of the ambient environment quality and the availability of drinking water sources

May 2013

ACTION PLAN: PRINCIPAL OBJECTIVE

Formulate and execute the principal actions to control, stop and move back the process of damages in the water quality in the Santa Lucía River watershed, and guarantee its quality and quantity for a sustainable use as drinking water supply.

FRAMEWORK OF ACTION: DEFINITION OF TARGET ZONES

In order to adopt measures to achieve the objectives of water quality in the Santa Lucía River watershed, **the following zones are established**:

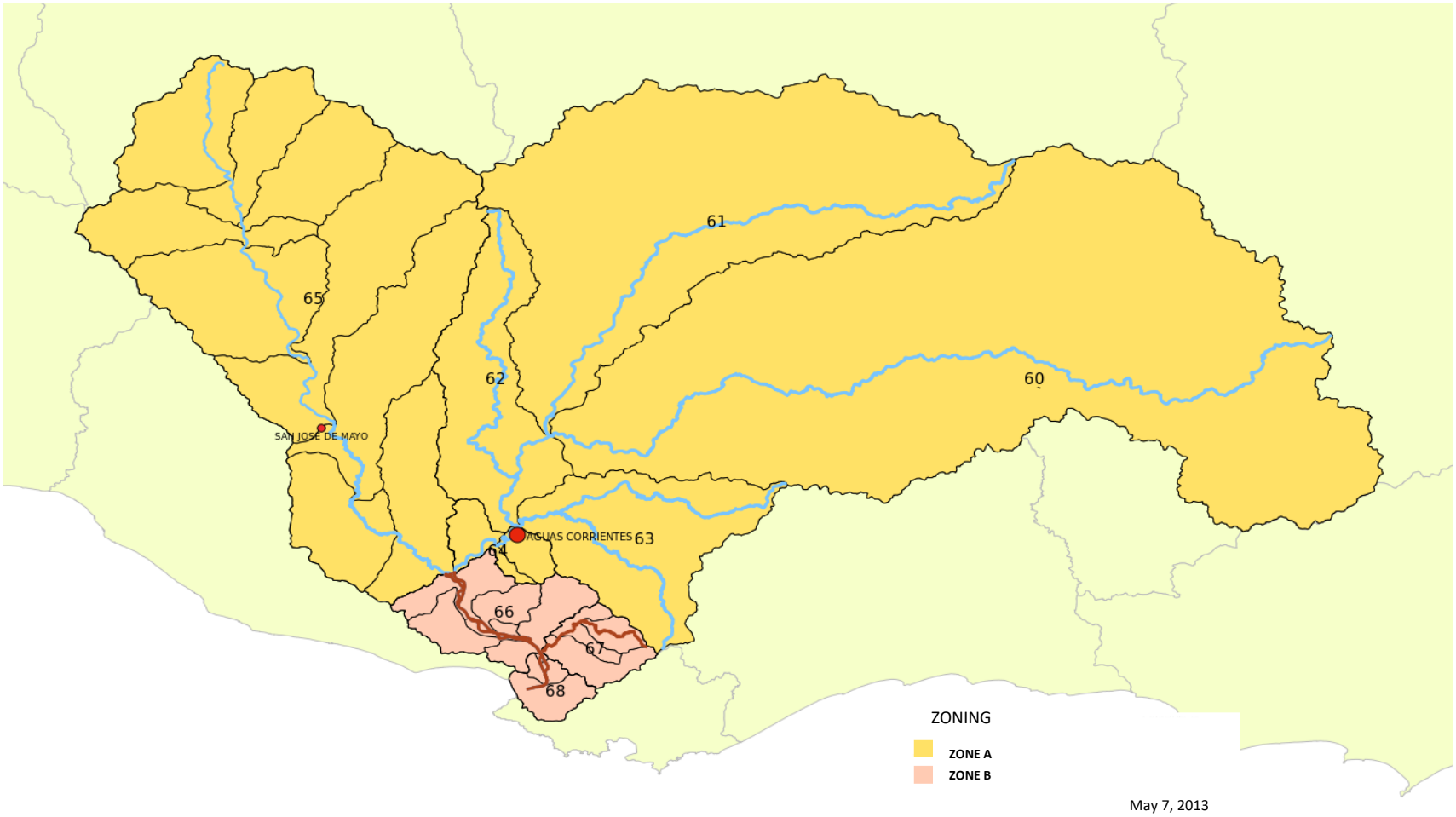
- **ZONE (A)**: Predominant use objective "Source of Drinking Water".

  Santa Lucía River (upstream of the confluence with the San José River; Santa Lucia Chico; Arroyo de La Virgen; San Jose River; Canelón Grande Stream and Canelón Chico Stream

- **ZONE (B)**: Predominant use objective "Conservation of water flora and fauna".

  Santa Lucía River (from the confluence with the San José River to the mouth in the Rio de la Plata.

BASE MEASURE: DEFINITION OF TARGET ZONES



ACTION PLAN

Measures to control environmental degradation in the Santa Lucía River Watershed

MEASURE 1

Implementation of a Sectoral Program **to improve environmental compliance with discharges of industrial origin** throughout the Santa Lucía River watershed and require the **reduction of the level of BOD, Nitrogen and Phosphorus**.

Criteria

- *Apply in all the Santa Lucía River basin , Zone (A) and (B)*
- *Apply differential deadlines of measures in the industries depending on the contributions in load of nutrients and organic matter.*

Industries	Deadline for project submission	Deadline for having built and in operation the modifications to comply with Decree 253/79
Priority 1 Industries	December 2013	January 2015
Priority 2 Industries	June 2014	December 2015

Objective

Reduce the impact of liquid emissions in the discharges of industrial origin.

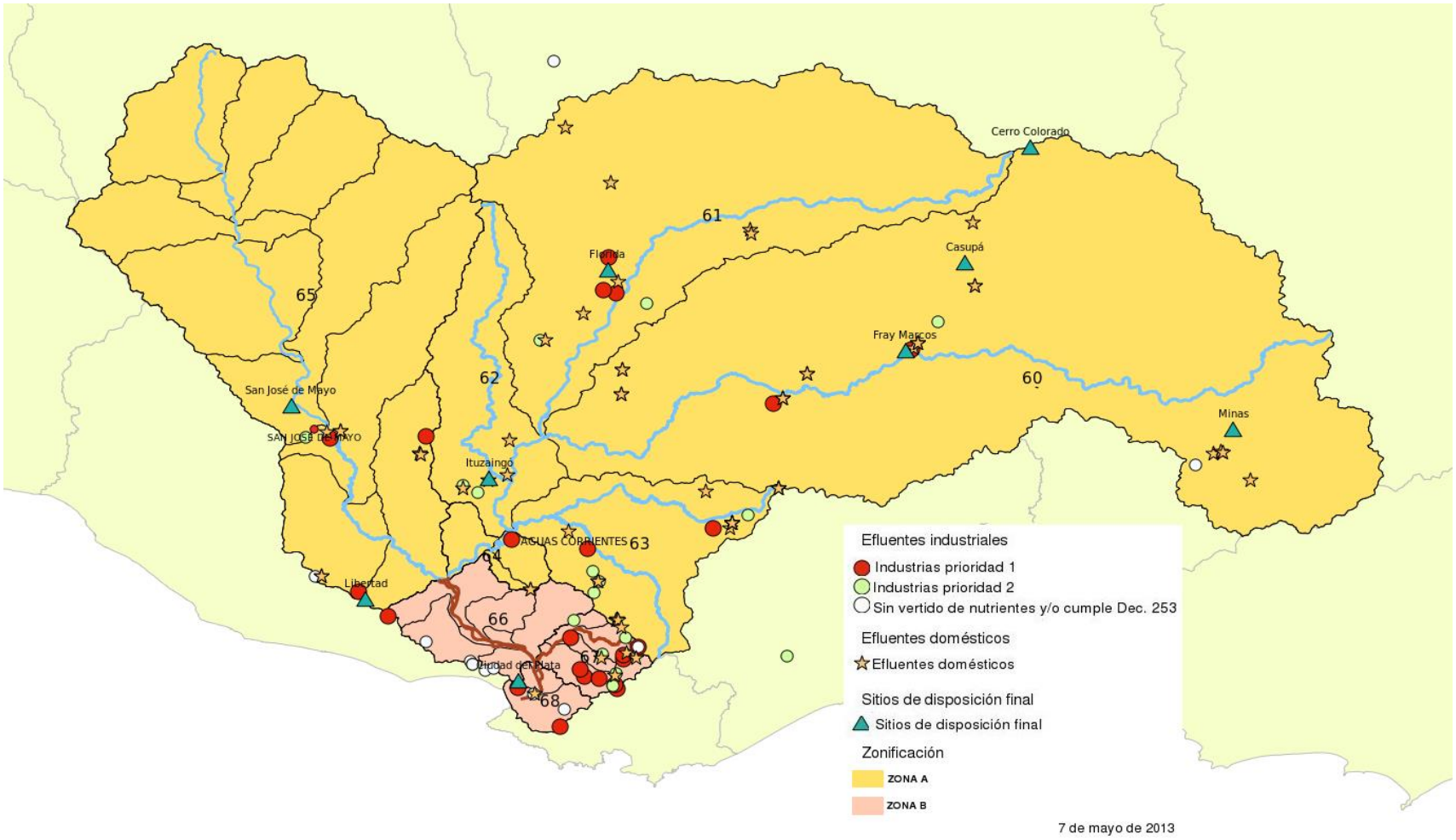
Basis

Law Nº 17.283 "General for the Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy". Decree Nº 253/979 "Water Pollution Prevention".

Responsible/s

MVOTMA

CONTROL PROGRAM



MEASURE 2

Implementation of a Sectoral Program to **improve environmental compliance with discharges of Household origin (sanitation)** throughout the Santa Lucía River watershed and **require the reduction of the level of Nitrogen and Phosphorus**. Prioritizing the cities of Fray Marcos, San Ramón and Santa Lucía.

Criteria *Apply in all Santa Lucía River basin (Zone A and B)*

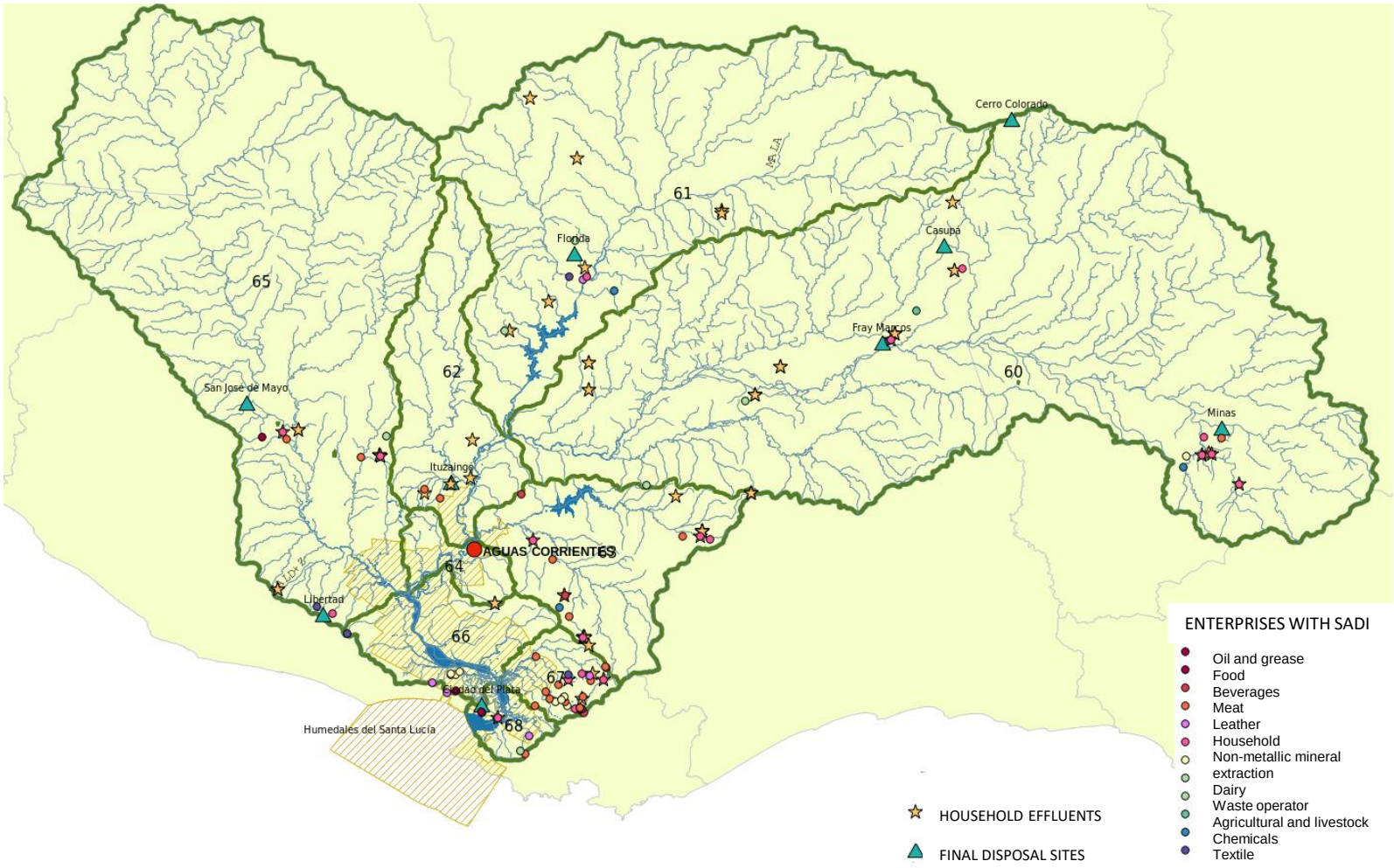
	Deadline for submission of projects	Deadline for having built and in operation the modifications to comply with Dec. 253/79
Sanitation	June 2014	December 2015

Objective *Reduce the impact of liquid emissions of household origin discharges (sanitation).*

Basis *Law Nº 17.283 "General for Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy". Decree Nº 253/979 "Water Pollution Prevention".*

Responsible/s ***MVOTMA***

PRESSURE: SOLID WASTE, INDUSTRIAL AND DOMESTIC EFFLUENTS



MEASURE 3

Declare as sensible priority zone the watershed declared as **ZONE (A)** and require in a mandatory way to all rural registers located in that watershed, the control of the application of nutrients and pesticides together with the submission of the **Plans for the Use, Handling and Conservation of Soil** to the MGAP.

It will be required the fertilization based on a **soil analysis** to reach and maintain the concentration **lower than 31 ppm of Bray Phosphorus1.**

Objective	*Control the excessive use of fertilizers.*
Basis	*Decree-Law Nº 15.239 and Decree Nº 405/008 "Soil Use and Conservation". Law Nº 17.283 "General Environment Protection". Law Nº 18.610 "National Water Policy".*
Responsible/s	*MVOTMA / MGAP*

MESURE 4

Suspend in the watershed declared as **ZONE (A),** the settlement of new enterprises of fattening cattle in pens **(feed lots)** or other practices of permanent confinement of cattle in open-air pens, as well as the expansion of existing ones**.**

The suspension will operate until the **new regulation of the activity is issued**.

Objective	*Control the nutrient intake in high-impact activities*
Basis	*Law Nº 17.283 "General Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy".*
Responsible/s	*MVOTMA / MGAP*

MEASURE 5

Require the mandatory treatment and management of effluents **to all Dairy farms** located throughout the Santa Lucía River watershed.

Criteria

Establishments + 500 cows Application for Discharges Dec. 2013 / Operation Dec. 2015

Establishments - 500 cows Application for Discharges Sep. 2014 / Operation Apr. 2017

Objective

Control the nutrient intake in high-impact activities

Basis

Law Nº 17.283 "General of Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy". Decree Nº 253/979 "Water Pollution Prevention"

Responsible/s

MVOTMA

MEASURE 6

Implement the **definitive solution to the handling and disposal of sludge** from the **Aguas Corrientes, OSE** drinking water treatment plant.

Criteria	*Definition of the **Executive Project**: April 2014* *Work Finished: "December 2015*
Objective	*Control the hydromorphological condition of the riverbed deterioration.*
Basis	*Law Nº 17.283 "General of Environment Protection". Decree-Law Nº 14.859 "Water Code".*
Responsible/s	*OSE / MVOTMA.*

MEASURE 7

Restrict the direct access of cattle to water in the courses of the watershed declared **ZONE (A)**. **Build a perimeter of restriction** in the surroundings of the **reservoirs of Paso Severino, Canelón Grande and San Francisco**. Access to water will be made indirectly by means of water intake.

Objective	*Control the supply of nutrients directly on the source of drinking water.*
Basis	*Law Nº 17.283 "General of Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy".*
Responsible/s	*MVOTMA / OSE / MGAP/ MTOP.*

MEASURE 8

Establish a **buffer zone** in the watershed declared **ZONE (A)** without tillage of the land and use of agrochemicals, (for the conservation and restitution of the riparian mountain as a way to restore the hydromorphological condition of the river) in **a strip of 40 meters** on both banks of the main courses (Santa Lucía River and San José River), **20 meters** in the tributaries of the first order (e.g.: Canelón Grande Stream) **and 100 m around the reservoirs**.

Objective

Avoid surface runoff with nutrient input. Avoid erosion and recompose the banks of the courses.

Basis

Law Nº 17.283 "General of Environment Protection". Decree-Law Nº 14.859 "Water Code". Law Nº 18.610 "National Water Policy". Law Nº 18.308 "Territorial Planning and Sustainable Development".

Responsible/s

MVOTMA

MEASURE 9

To urge those responsible for surface and groundwater extractions from the basin declared ZONE (A), who lack the respective permit, to request it within a maximum period of 6 months.

Objective	*Avoid exceeding the supply of the water resource and its self-purification capacity. This will be done for the purpose of carrying out an integrated balance (water and pollutant loads) to determine the remaining capacity.*
Basis	*Decree-Law Nº 14.859 "Water Code".*
Responsible/s	*MVOTMA*

MEASURE 10

Declare as **“reserve of drinking water”** the **Casupá Stream (El Soldado)** watershed**.**

Objective	*Increase the reserve of water for the drinking water system of Montevideo city and Metropolitan Area.*
Basis	*Decree-Law Nº 14.859 “Water Code”.*
Responsible/s	*MVOTMA.*

MEASURE 11

To obtain opinion **within the scope of the Santa Lucía River Basin Commission** regarding the measures that make up this Plan, ensuring the effective participation of the different actors that make it up.

Objective

Induce the responsible use of water resources and encourage the participation of the different actors in the management of the resource and the environmental protection of the basin.

Basis

Law Nº 18.610 "National Water Policy".

Responsible/s

MVOTMA.

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OTHER RESULTS OF THE COOPERATION:

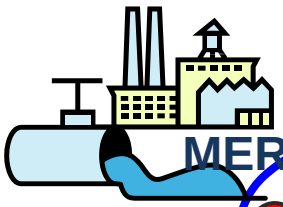
- **Santa Lucía River Water Quality Models**
- **Environmental Information System and Environmental Observatory (OAN)**

Principle of Water Quality Simulation (2)

Adding to Self-Purification Effect

Q_2, C_2 (**Pollution Source**)

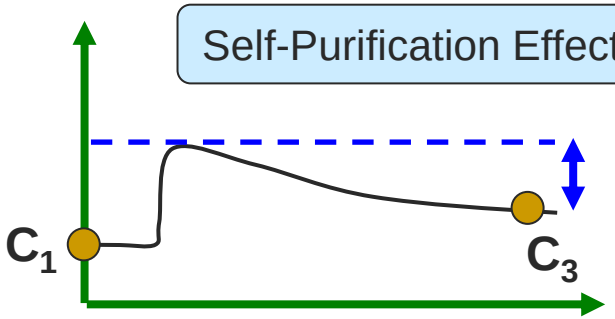
Q_1, C_1 (**Upstream before Confluence**)



MERCURY SEDIMENTS (2015 – 2017)"

$$C_3=(Q_1C_1+Q_2C_2)/(Q_1+Q_2)\cdot e^{-kt}$$

Decrease of amount of pollutants by Self-Purification



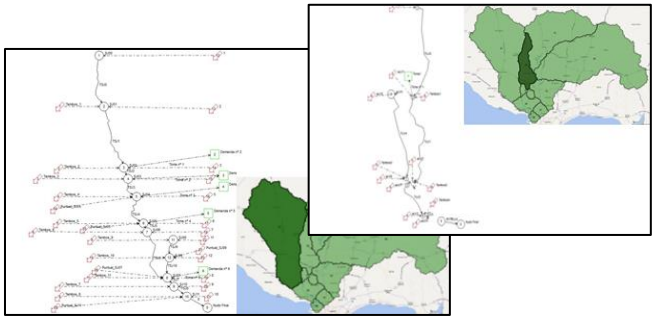
Q_3, C_3 (**Water Quality Checking Point**)

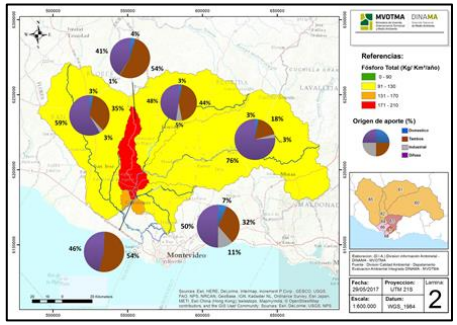
Predictive water quality modeling
ADVANCES

Modeling in the Santa Lucia Basin

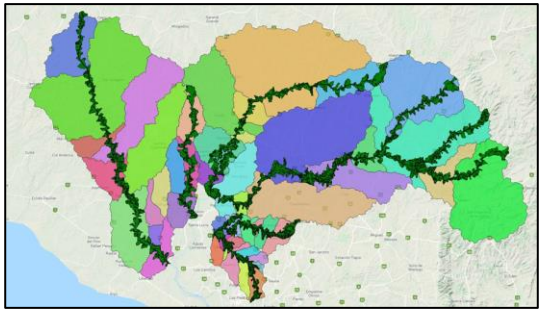
For the construction of the physical model of the sub-basins under study, the following are used:

- ❑ Digital terrain model (DTM)
- ❑ Hydrograph network
- ❑ Land use maps
- ❑ Environmental operational reports
- ❑ Survey of existing activities

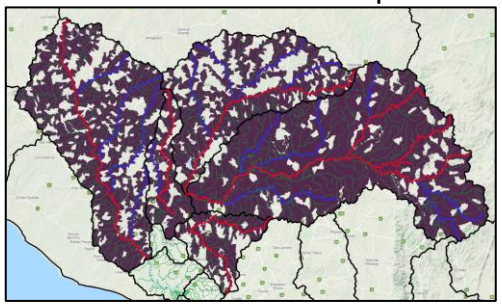




Buffer Zone: First action plan



Buffer Zone: Second action plan



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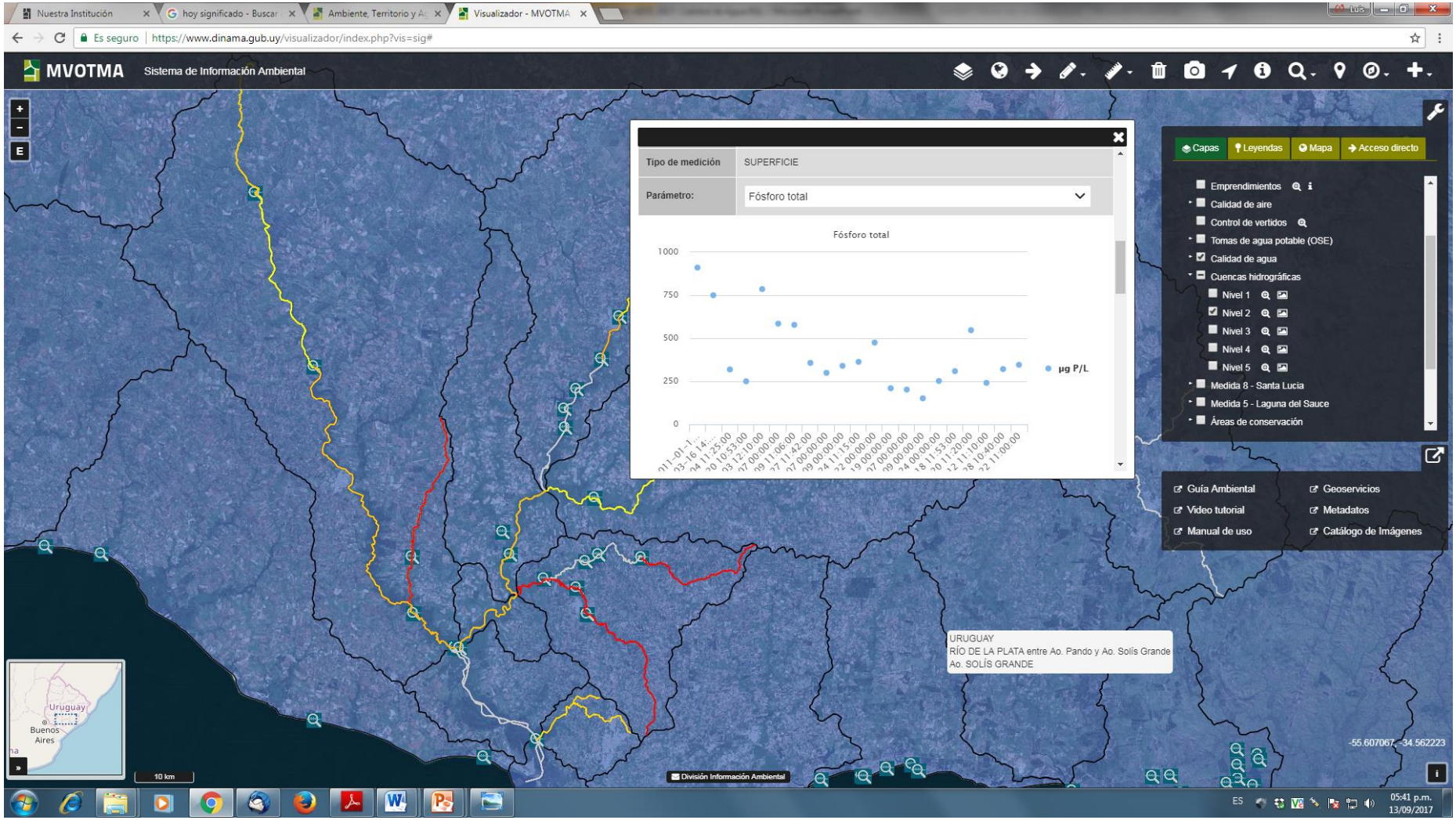
ENVIRONMENTAL INFORMATION SYSTEM: ENVIRONMENTAL VISUALIZER– OAN



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“Technical Cooperation URUGUAY / JAPAN JICA MERCURY IN SEDIMENTS (2015 – 2017)”

January 2022
Ministry of Environment – Environment Quality Division - Eng.Luis Reolon

Cooperation Agreement
Mercury in Sediments
DINAMA (Uruguay) & JICA (Japan)

MINUTES OF MEETINGS

FOR

"TECHNICAL COOPERATION ON DIAGNOSIS OF ACTUAL SITUATION AND ACTION PLAN DESIGN FOR THE REMEDIATION OF COASTAL STRIP OF LA PLATA RIVER HAVING AN ENVIRONMENTAL BURDEN OF MERCURY SEDIMENTS "

With respect to the request from the Ministry of Housing, Spatial Planning and Environment (hereinafter referred to as "MVOTMA") National Environment Directorate (hereinafter referred to as "DINAMA") on the technical cooperation concerning "Technical Cooperation on Diagnosis of Actual Situation and Action Plan Design for the Remediation of Coastal Strip of La Plata River Having an Environmental Burden of Mercury Sediments" (hereinafter referred to as "the Cooperation") proposed in August 2013, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a consultation team (hereinafter referred to as "the Team") from August 18, 2014 to August 22, 2014 for the purpose of defining the contents of the Cooperation.

During its stay in Uruguay, the Team exchanged views and had a series of discussions with the related Uruguayan authorities on the outputs and activities for the above-mentioned Cooperation.

As a result of the discussions, the Team and the Uruguayan authorities concerned confirmed the items described in the attached sheets.

This document has been prepared in Spanish and English and both versions are equally authentic. In case of any divergence of interpretation, the English text shall prevail.

Montevideo, August 22, 2014

MERCURY IN SEDIMENTS ,
Wetlands of the Santa Lucía River mouth

Source of the problem

At the end of 2009, it is detected in the framework of the monitoring of the Santa Lucia River basin, that at the monitoring site corresponding to the discharge of the company Efice, where sediment samples were taken, there are several values corresponding to the concentration of total Hg that were above the international standard values.

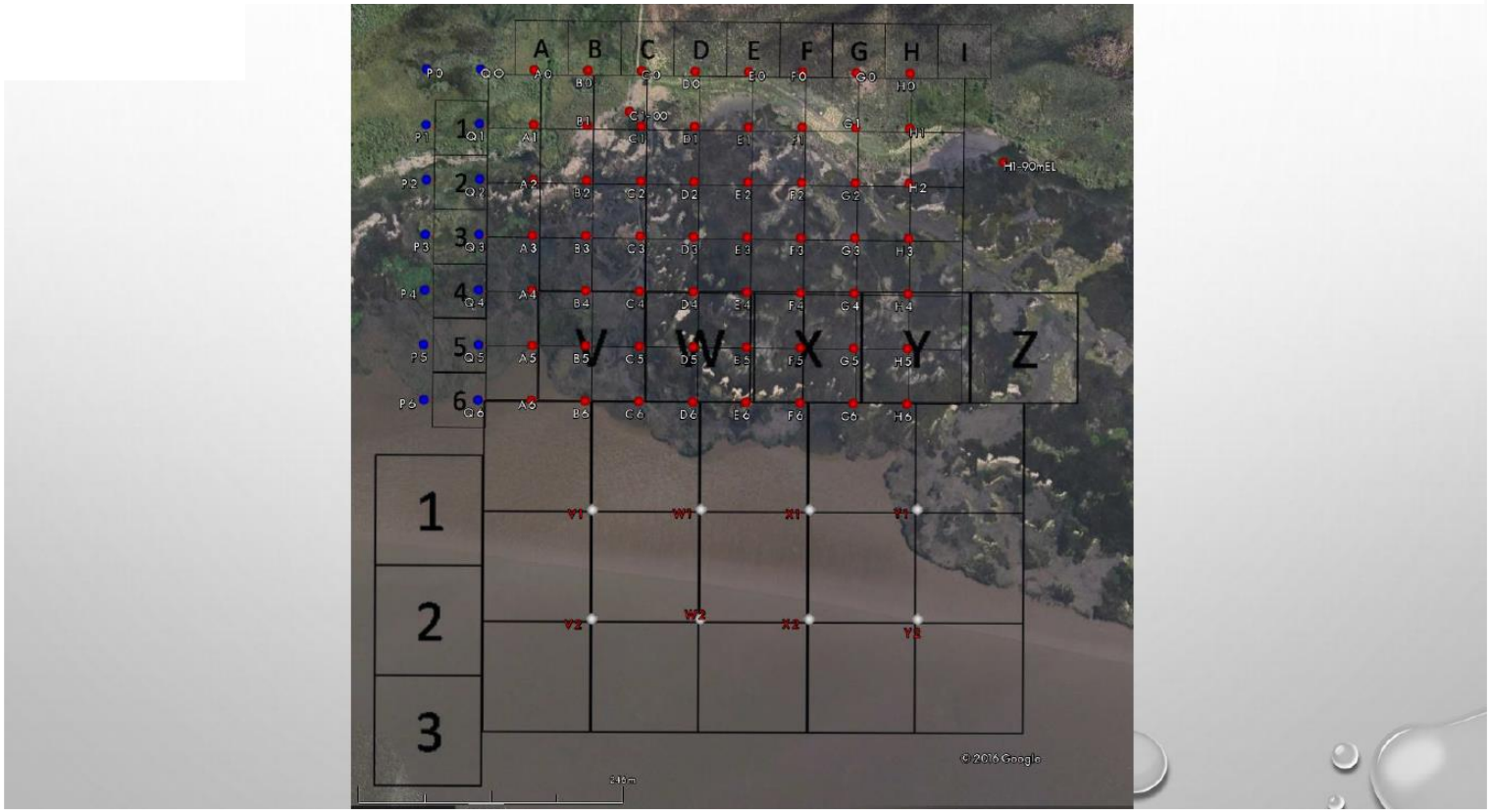
This triggers a series of efforts that lead to the Japanese cooperation (JICA) ending up advising on this issue of high complexity.

As a result of this, the present work comes up.

SAMPLING DESIGN

Sampling design

In light of the results obtained in the primary grid, two columns were added to the west of the primary grid.



FIELD WORKS OF MERCURY SAMPLING

Handheld Auger type equipment

Post hole digger

Digger shovel

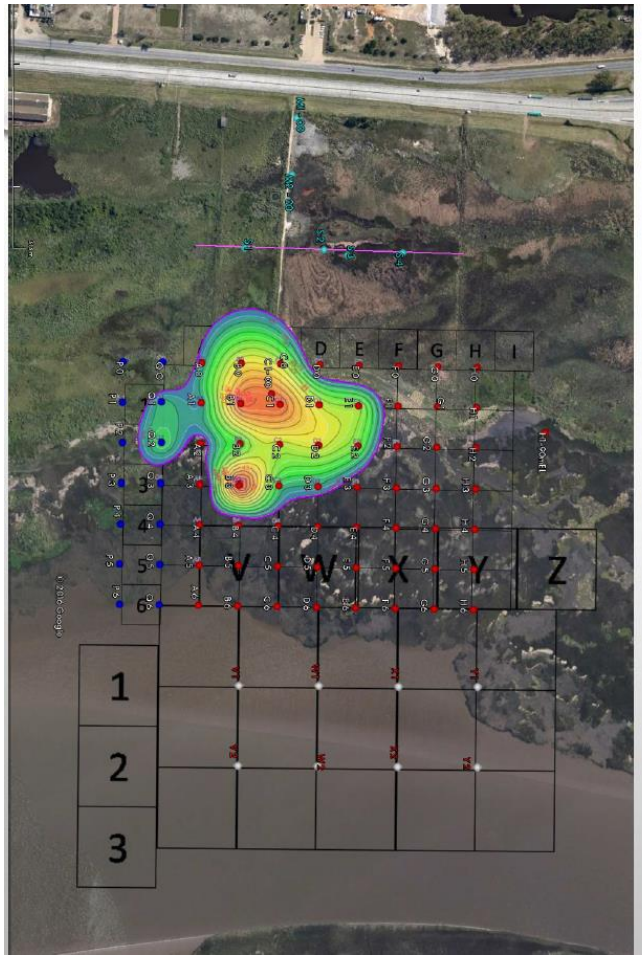
Corer type sampler

Posts

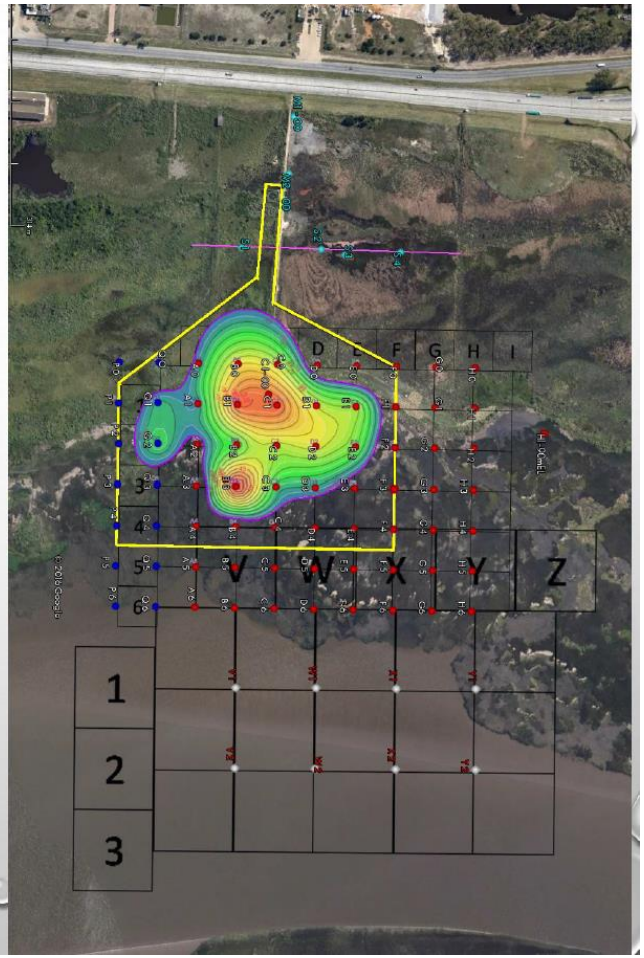
LABORATORY WORKS
MERCURY SAMPLING

cleaning and composition of the sample by weight

RESULTS: Mercury on site



Visualization of Hg concentrations in the field and projected fence to limit access to the site



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Cooperation Results transferred to other countries:

- **REGIONAL SEMINAR on WATER QUALITY in BASINS**
  Montevideo, August 26 – 30, 2013

- **REGIONAL SEMINAR on MONITORING and ANALISYS of MERCURY in different environmental matrices**
  March 20 to 24, 2017
  Montevideo- Uruguay

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SEMINARIO REGIONAL
EN MONITOREO Y
ANALISIS DE MERCURIO EN
DIFERENTES MATRICES AMBIENT
MVOTMA
ASOCIACIÓN
URUGUAYO JAPONE
DE COOPERACIÓ
TÉCNICA
JICA ALUMNI
URUGUAY


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Special thanks to:

Mr. Mitsuo Yoshida

Chief

Japanese Team in charge of the Final Evaluation

Japan International Cooparation Agency (JICA)

Eng. Luis Reolon
Environmental Quality Division
DINACEA/MA

luis.reolon@ambiente.gub.uy