

**ANNEX III**  
**ENVIRONMENTAL AND SOCIAL STRATEGY (ESS)<sup>1</sup>**  
**MONTES DEL PLATA**  
**URUGUAY**

**I. SUMMARY**

<b>Project name</b>	Montes del Plata
<b>Sector:</b>	Pulp and Paper
<b>Country:</b>	Uruguay
<b>Borrower:</b>	Celulosa y Energia Punta Pereira S.A. and Zona Franca Punta Pereira S.A.
<b>Total Project cost:</b>	Approximately US\$2.0 billion
<b>IDB A-loan:</b>	US\$200 million
<b>Environmental Category:</b>	A

**II. PROJECT AND COMPANY OVERVIEW**

**A. BACKGROUND**

- 2.1 The Montes del Plata project is to be located within a 361 hectares (ha) free trade zone established by the Government of Uruguay at Punta Pereira by the town of Conchillas in the Department of Colonia (southwest region of the country), on the coast of the Rio de la Plata estuary between Uruguay and Argentina. The project involves (i) the construction of a pulp mill with an annual capacity of 1.3 million tons of average air dried tons (AD/t) per year; (ii) the construction of a biomass-based 170 MW power generation plant that will be fed by the black liqueur and the bark obtained after treating the incoming wood (allowing Montes del Plata's mill not only to be energy self-sufficient, but also to sell power to the Uruguayan national grid); (iii) the construction of a port terminal with two docks: (a) an oceanic vessel dock; for large oceanic vessels for pulp exports, and (b) a barge dock to receive the incoming timber.
- 2.2 In 2009 Stora Enso Oyj together with Arauco acquired the majority of Spanish pulp producer ENCE's assets in Uruguay. The joint venture between Stora Enso and Arauco is Montes del Plata. Originally ENCE was planning to develop a pulp mill project 11 km east of the city of Fray Bentos, department of Rio Negro (west region of the country), on a site that has contained a wood chipping plant and port

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<sup>1</sup>

This Environmental and Social Strategy (ESS) is being made available to the public in accordance with the Bank's Policy on Disclosure of Information. The ESS has been prepared based primarily upon information provided by the project sponsors and does not represent either the Bank's approval of the project or verification of the ESS's completeness or accuracy.

facilities owned by ENCE at the *Terminal Logística de M'Bopicua*.<sup>2</sup> This proposed project was to be sited about 6 km from another proposed pulp mill project developed by Oy Metsa-Botnia Ab from Finland (Botnia) and both mills were to be located on the Uruguay River near the Uruguayan town of Fray Bentos and Argentina's Gualaguaychu city. These two projects became the subject of intense public interest from local and international civil society and caused significant press coverage. Opposition to the plants has been centered on potential environmental impacts and a perceived lack of transparency. Botnia built its pulp mill, aided by a loan from the IFC, and began operating in 2007. ENCE decided in September 2006 to relocate its project<sup>3</sup> to Punta Pereira. Montes del Plata is now the owner of ENCE assets related to the Project: Zona Franca Punta Pereira SA (ZFPP) and Celulosa y Energia Punta Pereira (CEPP).

- 2.3 Montes del Plata's planned pulp mill will use the Kraft process to manufacture bleached, baled pulp. The pulp will be produced using Elemental-Chlorine-Free technology with low chlorine dioxide consumption (ECF-Light) from plantation-grown eucalyptus trees. This technology involves a two-stage oxidation process that minimizes the volume of chemicals required for bleaching. Annex A includes a description of the ECF-Light bleaching technology and a comparison with other technologies.
- 2.4 The main processing units of the pulp mill will include the following: wood yard; digester; oxygen delignification; ECF bleach plant; pulp dryers; evaporators; recovery boiler, turbogenerators and recausticizing (i.e. chemical regeneration), water supply; and effluent treatment. The mill is proposing to utilize the water resource of the Rio de la Plata for process and cooling. The mill will be supported by its own energy generation plant, which will run on energetic rating of black liqueur and bark recovered from incoming tree trunks and other combustibles produced at the plant. The biomass power plant has a potential to generate 170 MW, 90 MW will be used in the plant and up to 80 MW could be sold to the Uruguayan national grid. The power plant will be located in the plant area and will include the following sub-components: (i) a recovery boiler and a biomass boiler for the production of steam; (ii) turbine generator; (iii) substations, electrical rooms and interconnection with the national grid; and, (iv) storage facilities for heavy fuel oil reserves to be used for starting up the mill and for backup purposes. .
- 2.5 A private dedicated marine terminal will be constructed on the Río de la Plata, within the project boundary. River barges and ocean-going vessels will deliver

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<sup>2</sup> In 2002, IDB financed through an A/B loan of US\$ 21 million, the port of M'Bopicua, consisting of a greenfield wood products export port facility located on the Uruguay river, 12 km of Fray Bentos, in the Department of Rio Negro, Uruguay. The project's total cost was US\$ 35 million. The port has been used by ENCE to export wood products.

<sup>3</sup> The original ENCE project was not exactly the same as the existing one carried out by Montes del Plata. For example, ENCE envisioned a one million tons capacity per year, while the total energy to be produced through biomass was 127 MW.

raw materials, and pick up baled pulp for distribution to paper mills in other locations. A new 700 m long navigation channel will be required to connect the port to the existing “Martin Garcia” navigation channel in the Río de la Plata. The terminal design includes administrative offices, a building for the *Prefectura Naval* and the *Dirección Nacional de Hidrografía*, a building for the port operator and a fire department building.

## **1. Forestry activities**

- 2.6 The government of Uruguay has been supporting the development of plantation forestry for the last two decades especially on lands in which the soil is classified as “Forestry Priority Soils” —a classification of the *Dirección General Forestal*, based on a land aptitude and zoning process. All planting plans must be approved by the *Dirección General Forestal*. There are a total of 17.3 million ha of land in Uruguay, of which 3.57 million ha have been categorized as “Forestry Priority Soils.” Currently the establishment of forested area is under one million ha.
- 2.7 The wood supply for the project will come from company-owned plantations as well as third-party (independent) suppliers. At full production it is estimated that Montes del Plata will require some 150,000 hectares of plantations (assuming a ten year rotation and an average mean annual increment (MAI) of 30m<sup>3</sup>/ha/year). During the initial four years based on available supply, a mixture of *Eucalyptus globulus*, *E. maidenii*, *E. bicostata*, and *E. grandis* will be used. After this initial period a mixture of *Eucalyptus dunnii*, *E. grandis*, and *Eucalyptus hybrids* will be used. The company has stated that a total area of 132,129 hectares is under FSC<sup>4</sup> forest management certification, of which 75,692 hectares have been planted. Additionally, the company has a FSC Chain of Custody certification which includes the chipping mill, woodyard and commercial exportation process. The company’s current focus is on building its Management System in order to pave the way for certificating all its operations with ISO 14001, OHSAS 18001 and FSC.
- 2.8 In the seven departments of Uruguay where Montes del Plata has a majority of its plantations (Flores, Durazno, Rio Negro, Soriano, Paysandú, Rivera and Tacuarembó) some 1,500,000 hectares of land have been designated as having “Forest Priority Soils.” This would indicate that there would be sufficient land area to cover Montes del Plata supply requirements, when combined with other pulp mills in the region (IFC Cumulative Impact Study, Uruguay Pulp Mills, 2006).<sup>5</sup> As a result, the same study suggests that there should be no indirect

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<sup>4</sup> Forest Stewardship Council FSC certification provides a credible link between responsible production and consumption of forest products, enabling consumers and businesses to make purchasing decisions that benefit people and the environment as well as providing ongoing business value.

<sup>5</sup> Cumulative Impact Study of the construction and operation of the two pulp mills and their respective raw material sourcing commissioned by the IFC and prepared by Econometrix, September 2006.

pressure for clearing of natural forests and/or for conversion or encroachment in protected areas.

## **2. Associated Facilities**

- 2.9 There is additional infrastructure that is not part of the proposed IDB financed Project and as such has not been assessed as part of the Project's EIA. It will be herein referred to as Associated Facilities. They are as follows:
- 2.10 **Transmission lines.** Two electric transmission lines are required, one of 15 KV for the construction phase and the other of 150 KV for the operation of the plant. The permit process, construction and operation of these lines are under the responsibility of the Uruguayan Electricity Utility-UTE (*Administración Nacional de Usinas y Transmisiones Eléctricas*), Montes del Plata is financing the costs. The 15 KV line has already been constructed and in operation. The permit process has started for the 150 KV line.
- 2.11 **Extension of Route 55.** In order to facilitate access to the site and to divert the traffic from Conchillas, a new 12 km access road will be built to connect the site to the existing highway system (Route 55). The road project will be built by Montes del Plata under the supervision of the Uruguayan Government (*Dirección Nacional de Vialidad-DNV*), which will also be responsible for handling the land purchase required. Montes del Plata will assume the cost of the construction and the land purchase. The DNV has already presented an EIA to DINAMA (*Dirección Nacional de Medio Ambiente*). Until the access road is completed, a provisional road will be used to ensure that traffic is diverted from central Conchillas.

## **B. SITE ALTERNATIVE ASSESSMENT AND TECHNOLOGY ALTERNATIVES**

- 2.12 After ENCE decided to relocate its pulp mill project from Fray Bentos, it undertook a thorough alternative site evaluation to consider new location options for the pulp mill. In the first phase of this analysis, 20 regions encompassing 70 sites were evaluated. The analysis considered: economic, geographic, infrastructure/resource availability, transportation access and other factors. In the second phase of the analysis, ENCE identified sites that had adequate supply of fresh water, ample land, were far from major population centers or environmentally sensitive areas, and required minimal dredging. Two locations were identified that met these criteria, of these, Punta Pereira was selected due to geotechnical reasons, logistical considerations, and the characteristics of the site. Furthermore, the Environmental Impact Assessment prepared for the project included a summary of the site alternative assessment, *Viabilidad Ambiental de Localización* (VAL). The specific location was also discussed in detail with the Municipality of Colonia. Montes del Plata undertook additional studies to confirm the selection process of the site location and as a consequence is developing the project in the same site with some changes in the layout of the process areas.

- 2.13 Regarding bleaching technology alternatives, the reviewed environmental documents do not discuss alternative approaches, specifically the Elemental-Chlorine-Free (ECF) bleaching process versus the Total-Chlorine-Free (TCF) bleaching process. Annex A describes the ECF, TCF, ECF-Light bleaching technologies.

### **III. ENVIRONMENTAL AND SOCIAL COMPLIANCE STATUS**

#### **A. COMPLIANCE WITH URUGUAY'S ENVIRONMENTAL ASSESSMENT AND PERMITTING REQUIREMENTS**

- 3.1 Decree 349/005 “*Reglamentacion de Impacto Ambiental*” that regulates Law 16466/94 “*Ley de Medio Ambiente*” establishes the requirements for obtaining environmental permits for large scale projects. It starts with a location-specific environmental feasibility study (*Viabilidad Ambiental de Localizacion VAL*) which is needed to determine if a selected location is suitable for a project from an environmental point of view, after that an EIA is prepared. All projects must present to the National Environmental Authority (*Dirección Nacional de Medio Ambiente – DINAMA*), of the Ministry of Housing, Territorial Planning and Environment (*Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente –MVOTMA*), the project's environmental information (e.g. EIAs, environmental management plans) prior to initiating any construction activity. DINAMA reviews the project information and classifies the project in one of three classes: A, B and C. Projects or activities classified as Class A do not need to present an EIA report, but an environmental management plan, whereas projects classified as Class B<sup>6</sup> or C<sup>7</sup> require the preparation of an EIA report, according to the scope and contents as defined in the mentioned Decree.
- 3.2 Following approval of the EIA, DINAMA grants an initial environmental authorization (*Autorizacion Ambiental Previa, APP*) for the project. The AAPs identify certain restrictions and conditions in compliance with requirements and safeguards set forth under Uruguayan Laws and commitments made in the EIAs presented by the proponents. For the construction and operational phases of the projects, the project proponents are required to submit detailed Environmental Management Plans (*Plan de Gestión Ambiental, PGA*).
- 3.3 Before operation begins, a separate authorization is required. The Environmental Authorization of Operation (*Autorización Ambiental de Operación, AAO*) will only be issued after construction is complete and a compliance monitoring plan has been submitted and approved. This AAO has to be renewed every three years

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<sup>6</sup> Category B under Uruguayan regulation refers to “activities, constructions, with moderate significant environmental impacts, whose negative effects can be eliminated or minimized with well known and easily applicable mitigation measures.

<sup>7</sup> Category C under Uruguayan regulation refers to project activities with significant negative environmental impacts, whose mitigation or prevention measures can be existent or not.

and DINAMA can impose additional protective conditions on the project company, if additional requirements and safeguards are considered necessary.

1. Regarding the Project's compliance status, on June 2007 the *Viabilidad Ambiental de Localización* was granted by DINAMA. On November 2007, CEPP presented an EIA for the pulp mill, power plant and port facilities in Punta Pereira, Colonia (*Fábrica de Celulosa, Energía Eléctrica e Instalaciones Portuarias en Punta Pereira*), which was classified as Category C, and on June 20, 2008 CEPP received its *Autorización Ambiental Previa*. Due to the changes in the pulp mill project (such as expansion of the production capacity), an update of the EIA was prepared by Montes del Plata and submitted to DINAMA. The *Autorización Ambiental Previa* for the updated EIA was granted on December 30, 2010. Public Disclosure
- 3.4 Uruguayan regulation requires disclosure of the *Environmental Impact Assessment* and public hearings for Category C projects; the consultation must be announced in local newspapers. On February 7, 2008 a summary of the EIA was made available at DINAMA's website. On April 1st, 2008, a public hearing took place in the town of Conchillas to disclose the document (still under ENCE's sponsorship). The updated EIA prepared by Montes del Plata is disclosed in the DINAMA website and a new public audience took place in Conchillas on December 9, 2010.
- 3.5 DINAMA also posts other key environmental information<sup>8</sup> on its webpage, such as public hearing notifications, approval of AAP, summaries of the Environmental Impact Studies, etc.

## **2. Forestry Plantations**

- 3.6 Montes del Plata complies with Uruguayan regulation regarding forestry plantations. The majority of the plantations are located in "Forestry Priority Soils" and the forestry plans have been presented to the *Dirección General Forestal*, and to DINAMA as required by the Uruguayan regulations. For the 2010 Plantation Plan (18,200 hectares) 100% of the lands already have their permits issued. For the 2011 Plantation Plan (21,100 hectares) a majority of lands (approximately 90%) already have their permits.

## **B. ADDITIONAL ACTIVITIES TO ENHANCE PROJECT SUSTAINABILITY**

- 3.7 Montes del Plata is in the process of finalizing a comprehensive Environmental and Social Impact Assessment following the approaches and methodologies

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<sup>8</sup> The alternative site assessment for the Paper Pulp mill (which is the FTZ area) is posted on the DINAMA webpage under the link [http://www.mvotma.gub.uy/dinama/index.php?option=com\\_docman&task=cat\\_view&gid=32&dir=DESC&order=date&Itemid=121&limit=5&limitstart=25](http://www.mvotma.gub.uy/dinama/index.php?option=com_docman&task=cat_view&gid=32&dir=DESC&order=date&Itemid=121&limit=5&limitstart=25)

The Environmental Report Summary of the project is posted on the DINAMA webpage

[http://www.mvotma.gub.uy/dinama/index.php?option=com\\_docman&task=doc\\_download&gid=364&Itemid=122](http://www.mvotma.gub.uy/dinama/index.php?option=com_docman&task=doc_download&gid=364&Itemid=122)

The updated EIA is also posted on the DINAMA webpage

[http://www.dinama.gub.uy/index.php?option=com\\_docman&task=doc\\_download&gid=1328&Itemid=372](http://www.dinama.gub.uy/index.php?option=com_docman&task=doc_download&gid=1328&Itemid=372)

required by international financial agencies such as the IFC, WB and Equator Principles. The study will include both the industrial project and plantation activities and will consolidate all the existing environmental, social and economic impact studies into one document. Additionally Montes del Plata is preparing a Strategic Environmental Assessment for planned plantations in a radius of 200 Km from Punta Pereira (this SEA will be shared with DINAMA).

### **C. COMPLIANCE WITH IDB SAFEGUARD REQUIREMENTS**

- 3.8 According to the Safeguard Policy Filter, this Project has triggered the following directives of the Environment and Safeguards Compliance Policy (OP-703): B.3 (Screening and Classification), B.4 (other risks including Associated Facilities), B.5 (Environmental Assessment Requirements), B.6 (Consultations), B.9 (Natural Habitats and Cultural Sites), B.10 (Hazardous Materials), and B.11 (Pollution Prevention and Abatement), therefore the Project Team proposes an A classification for the project.
- 3.9 The Bank will also require that the Project complies with the directives: B.2 (Country Laws and Regulations), B.7 (supervision and compliance) and B.17 (Procurement) as well as with the Public Information and Disclosure Policy (OP-102). The information available at this stage indicates that the Project will not require involuntary resettlement. Also, a thorough evaluation is necessary in order to identify if directive B.8 (Transboundary Impacts) is applicable to the Project in order to evaluate the potential impacts in Argentina due to the channel dredging works during construction and the liquid and gas effluents during the operation of the mill.

## **IV. ENVIRONMENTAL AND SOCIAL SETTINGS**

### **A. ENVIRONMENTAL SETTING**

- 4.1 The Project EIA describes extensively the environmental baseline conditions. Field work to obtain primary data was extensive and more than 42 technical professionals participated on the development of the EIA.
- 4.2 The Project is located on the coast of the Río de la Plata estuary, a funnel-shaped indentation that forms part of the border between Argentina and Uruguay. The Rio de la Plata estuary is formed by the confluence of the Parana and Uruguay rivers (these are the two main tributaries of the Rio de la Plata). The estuary is 48 km wide where the rivers join and 220 km wide where the estuary opens onto the Atlantic Ocean. The major ports on the estuary are Buenos Aires and La Plata city in the southwest and Montevideo in the northeast. The estuary receives sewage and industrial effluents from the metropolitan area of Buenos Aires and La Plata city in Argentina and also the sediments and other contaminants swept by the Parana and Uruguay rivers. A bi-national organization formed by Argentina and

Uruguay known as the Rio de la Plata Administrator Commission (CARP) was created in the 1970s to oversee activities involving the river.

- 4.3 Given that there is no industrial activity in the area, the pre-construction air and noise (environmental) baselines for the project area are considered good: the primary noise in the area is from intermittent rural transport and the only air quality issues of note relate to pollen dissemination and seasonal blossoming of some plant species.
- 4.4 The area of the Project is characterized by gently rolling topography of sand and rocks. The area has been previously used as a site of extractive industries; rocks, sand and *conchilla* (small shells) quarries, and it is adjacent to agricultural production plots. The terrain contains large pits/excavations (abandoned quarries) and remains of infrastructure (jetty, silo, equipment, etc.). The area contains interspersed fragments of Eucalyptus, Pines and natural vegetation (secondary regrowth), with two remnants of hydrophilic vegetation over beach dunes located at the southern tip. Some native vegetation was removed for Project construction under corresponding environmental permits, most of the vegetation removed was of non-native origin. The EIA did not identify any threatened or endangered plant species.
- 4.5 The study of *terrestrial fauna* of the project area concentrated on birds, reptiles, amphibians and mammals. None of the reptile or amphibian species found are considered threatened according to the IUCN Red List of Species<sup>9</sup>. Of the 62 species of birds identified, the majority (51) are considered resident (i.e. non migratory). Nine species are considered ‘summer residents’ (i.e. reproduce in Uruguay between September and March). These include the glittering-bellied emerald, great kiskadee, and the scissor-tailed nightjar. One species (sand martin) is considered as a ‘summer migrant’ (i.e. pass through during September-November and March-May). All of these are considered as Least Concern by the IUCN. One species is considered introduced (*Chloris chloris*, or ‘verderon’). In terms of mammals, the EIA mentions the possible presence of *Leopardus geoffroyi* (or *Oncifelis geoffroyi*), Geoffrey's cat or ‘gato montes’, which is considered Near Threatened. All other species identified do not raise a conservation concern.
- 4.6 The *aquatic fauna* in the estuary of La Plata is similar to that of the Uruguay-Parana complex i.e. of predominantly fluvial characteristics, and is composed of some 150 species. Both phyto- and zooplankton species identified are cosmopolitan and of wide distribution range. The most common fish species belong to the Caraciform and Siluriform families. Some species of the latter are commercially important (e.g. *surubi-Pseudoplatystoma sp.* and *pati – Luciopimelodus pati*). Sampling of these species has revealed both adults as well as juveniles, suggesting that the area may be suitable as a nursery, in a similar fashion to most of the coastal zone of the La Plata estuary.

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<sup>9</sup> <http://www.iucnredlist.org>



- 4.7 Despite discharges of sewage and industrial effluents on the Argentine margin, the diversity and relative abundance of benthonic taxa along the Uruguayan coast are indicative of uncontaminated waters. However, at the time of drafting this ESS, the revised documents lacked information regarding detailed water quality baseline against which project impacts may be measured quantitatively. Therefore its adequacy and completeness will be fully assessed during due diligence. The available information on the project has not revealed any threatened aquatic species in the Project's area of influence.
- 4.8 The Project's plantations are located in the 'Pastizales del Plata' ecoregion of the southern cone of South America, an area characterized by natural grasslands that originally spanned over 100 million hectares shared by Argentina, Brazil, Paraguay and Uruguay. Over the last two centuries some 50% of this ecosystem has suffered conversion due to agricultural development – mainly monocrop cultures such as sorghum, wheat and soybeans – as well as urban expansion. The other half is constituted of pasture landscapes used for cattle ranching on an extensive basis. Only a small proportion (2%) of the original grassland ecosystem is under any form of formal protection as official protected areas.
- 4.9 As such, natural grasslands are considered as natural (and possibly critical) habitats depending on their biodiversity and ecosystem services features key to conservation for instance of endangered bird species. Details about the environmental setting for the forestry plantations (both company owned and independent producers) are lacking at this stage. The due diligence will analyze the predominant environmental conditions in order to assess potentially significant impacts of forestry plantations and evaluate measures to minimize and mitigate these (see Section D, below). The Bank's due diligence will also assess the threats to, and opportunities for, maximizing the protection of natural grasslands habitats in terms of the location of the forest plantations and the potential cumulative impacts that these may generate.

## **B. SOCIAL SETTING**

- 4.10 As previously stated, the project area is located in the Department of Colonia's western sub-region, most directly affecting the towns of Puerto Inglés, Conchillas, Pueblo Gil, Colonia, Carmelo, Nueva Palmira, Ombues de Lavalle and Tarariras. Department-level census data indicates that the Department of Colonia's current population is approximately 120,000 with an ethnic composition of predominantly European ancestry. With an average monthly income of US\$625, the Department's population registers lower unemployment and underemployment rates than the national average, at 9.8% and 10.8% respectively. Particularly in the western sub-region of the Department, economic activity has centered around building up the tourism industry, based on proximity to river beaches and historical and cultural attractions including wineries, vineyards and a budding aquatic sports activities. The small urban centers that make up the Department, accounting for 86.1% of the population, are surrounded by sparsely-population rural areas characterized by family-run farms, small-scale farms, agricultural entrepreneurs and wage-earners dedicated to agriculture, cattle-raising, dairy

production, cereal, apiculture, viticulture and some artisanal fisheries.

- 4.11 In terms of historical origins and local identity, the area is not inexperienced in hosting large, foreign-owned, extractive industry companies. From 1887 to 1950 the British stone and sand company Walker and Co. was the largest employer in the area, building “Company Town”-style housing and services for their approximately 2500 workers in Conchillas.<sup>10</sup> Later the Roselli Company occupied a similar role in the local society intermittently from 1957 to 2002. Since its closing and between the periods when these large companies were operating, the town’s economy has gone through both economic downturns as well as favorable touristic reinvention of the area based on native attributes such as its tranquility and small-scale hospitality.
- 4.12 The present project will require up to 6,000 workers during peak construction. Given the composition and estimated supply and availability, the sponsor estimates that its demand will exceed available labor supply from the department of Colonia. Non-local workers will have to be hired and lodged on the project site. In terms of the expected demographic composition of the workforce, the free trade zone “user agreement” that they signed obliges the sponsor to hire at least 75% Uruguayan workers<sup>11</sup>;
- 4.13 Regarding cultural heritage, the original project sponsor (ENCE) contracted a multidisciplinary team from the national university’s Humanities and Science Department to investigate the archeological and cultural heritage in the project area. Between 2007 and 2008, 69 researchers worked on an 11 month study, some of the archeological artifacts found were of some significance such as arrows, but the majority were lithic fragments. The most interesting result of this study was the historic and anthropologic reconstruction of the traditions and industrial history of the local area

## **C TRANSBOUNDARY ISSUES**

- 4.14 This project is expected to have a very high profile with extensive exposure and reputational risk for the Bank, due to the precedent of the Botnia plant (existing UPM project) on the coast of the River Uruguay, including protests from civil society, citizen, and non-government organizations that resulted in the blockade of the bridge connecting the Argentine city of Gualeguaychu and the Uruguayan city of Fray Bentos over the River Uruguay since 2006, adversely affecting the transport of goods and passengers including Uruguay’s regular inflow of Argentine tourists. The blockade was lifted on June 20, 2010, although sporadic protests are still happening on the Argentine side. The UPM project and all these events triggered a

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<sup>10</sup> The “Archeological and Cultural Impact Assessment” financed by ENCE and carried out by the University of Uruguay’s Humanities and Science Department in 2008 focused on Puerto Inglés and Conchillas, two of the towns in the project’s area of influence.

<sup>11</sup> In very particular cases and according to specific procedures the Ministry of Economy can grant exceptions (e.g. lack of trained Uruguayans for specific positions).

dispute at the International Court of Justice (“ICJ”) between the two countries about regulations related to the Uruguay River and related environmental effects. Tensions have eased after the ICJ’s ruling about the dispute between the two countries. Further to the ruling, the two countries have created a joint commission to manage issues related to the Uruguay River and created a framework to manage future situations.

- 4.15 The events described above require the Bank to consider the lessons learned from the experience of the UPM project plant and the original (and ultimately discontinued) plans to build an ENCE plant on the River Uruguay. It will be essential to address the concerns that were raised by these projects in Uruguay and Argentina and ensure that the Montes de Plata project has a viable and transparent communications strategy that will inform the public through the provision of accurate, unbiased information. It will also be necessary to review the case that was presented to the ICJ in order to gather lessons learned. For the project it will be necessary to confirm that the project is fully compliant with international law and with the agreements relating to the Río de la Plata.

## **V. ENVIRONMENTAL AND SOCIAL POTENTIAL IMPACTS AND RISKS**

- 5.1 The nature of the impacts and risks for this project varies from the construction phase to the operational phase. The majority of the construction impacts are related to dredging activities and material disposal for the construction of the pulp mill, port facilities and the navigation channel. For operations, the potential impacts are mainly related to changes in the water quality of the Rio de la Plata, air emissions and effluents regarding the pulp mill operation and the associated socioeconomic impacts as a result of the Project implementation in the area of Punta Pereira.

### **A. CONSTRUCTION PHASE**

- 5.2 Most of the environmental impacts from the construction will be those typically generated at large scale construction works and will be associated with clearing and preparation of the areas, construction of the port and warehouse installations, pulp mill facilities and access roads. The dredging and disposal of excavated material will create some adverse direct impacts. As discussed below, most of the construction related environmental impacts will be localized within the project area and limited to the duration of the construction. These impacts can be mitigated with standard and readily available environmental management systems and procedures and industry good practices.
- 5.3 The potential environmental impacts associated with the construction of the port terminal relate to: (1) alterations of water quality by dredging and sediment transport and final deposition (potential to cause physical and chemical changes in the water column); (2) temporary impacts to benthonic aquatic fauna by physical disturbance and loss of habitat; (3) temporary impacts to pelagic fauna by sediment carrying plumes; and (4) alterations to the bathymetry and hydrodynamic conditions in the area of direct influence of the dredging work and

port terminal construction, influencing the geomorphology and sedimentation patterns in the vicinity of the port. Dredging volumes are estimated to be of the order 4,200,000 m<sup>3</sup>, with an associated depth of 11 m in the first phase of channel opening and 14 m in the second phase. According to the simulations made with the hydrodynamic model the average concentrations of fine sediments will vary between 75 and 125 mg/l with a maximum of 175 mg/l. Part of the dredged material (between 500,000 and 1,000,000 m<sup>3</sup>) will be reutilized in the construction of the embankments. The surplus material will be transported and placed in a landfill specifically designed to prevent sediment carriage by rainfall back to the river. The deposition will be situated in a previously cleared and degraded area situated between the 'zona franca' and the Conchillas embankment.

- 5.4 The potential environmental impacts associated with the construction of the pulp mill facilities, power plant and access roads are (1) increase of CO<sub>2</sub> and other gases, and particulate matter emissions e.g. from vehicles, construction equipment (2) noise increase; (3) temporary changes to the water quality associated with the soil movement and disposal of this material; (4) loss of vegetation cover and fauna habitats as well as erosion will be minimal as the project site is located in an area already altered with extractive industry activities; (5) changes in the natural run-off patterns due to changes in the topography of the site. In terms of the natural habitat of the plant site these impacts are not considered to be significant, given that the affected fauna and flora species are not unique to the site and/or are under any conservation threat, and the site has already been substantially degraded due to past conversions. Also, the sponsor has been required to set aside an area of 4 hectares as a conservation measure (arboretum) to compensate for the loss of some fragment of native vegetation.
- 5.5 Similarly, the impacts to the water quality of the Rio de la Plata are also not expected to be significant given that measures will be put in place to prevent surface water and sediment run-off, such as sedimentation lagoons, channeling and suitable covering of excavated materials.
- 5.6 The potential impacts on the social environment are: (1) social changes and overload of some public services (transport, solid waste collection) due to the influx of non-local people. During peak construction, as many as 6000 workers will be required. This workforce will exceed available labor from the department of Colonia. These workers will be mostly lodged at the Project site; (2) increase safety risks from road transportation of large equipment and personnel; (3) neighborhood safety and crime rates could possibly be altered by the influx of outside workers; (4) health risks to local population including the heightened risk of sexually-transmitted diseases -including HIV/AIDS. These impacts are not expected to be significant given that the company will install a centralized service center for the construction period (including housing, restaurants, transport, energy, drinking water, effluent treatment, waste collection, communication, and health and recreation services for the construction workers), measures will be in place to help the municipalities improve the public services and the workers will adhere to a code of conduct. Also it is estimated that the project will create jobs

for qualified locals. In that regard, the company is working with local authorities to qualify local workers and assure their inclusion for the construction phase of the Project. The exact number and proportion of local and outside workers will be identified during due diligence.

**B. OPERATIONAL PHASE:**

- 5.7 Major potential environmental and social negative impacts related to the operation phase will be associated with: (i) liquid effluents: these effluents will be treated via a wastewater treatment plant using an activated sludge process. The process will have a security system with safety ponds of 75,000 m<sup>3</sup>. The outgoing treatment effluent will be channeled to the river via an emissary compliant with Uruguayan standards; (ii) atmospheric emissions: there will be a collection and treatment system in place for treatment of TRS<sup>12</sup> and volatile odorous gases, electrostatic precipitation for dust abatement and a scrubber gas washer for SO<sub>2</sub> and VOC<sup>13</sup> abatement. Depending on the direction of the wind, after the first year and under normal operation conditions there is only a slight likelihood of odor emissions to be perceived and venting will be occasional. (iii) noise emissions at port and mill facilities including the biomass power plant. The models show that the noise emissions will comply with noise World Bank standards. Some of the risks identified for the operational phase are: iv) increased risk of accidents related to road and marine transportation of the inputs and outputs of the mill (v) occupational and safety risks related to accidents involving port and mill workers, but not specially hazardous safety risk are involved in a pulp mill; (vi) risk of soil and water contamination due to spills, leaks and discharges of products, (vii) induced urban growth associated with the port and mill activities.
- 5.8 The Company has committed in the EIA to prevent, mitigate or minimize these impacts by using appropriate equipment and operation procedures in port operations, and adopting the best available technology (“BAT”) in terms of pulp production, involving the use of modern processes (e.g., use of the ECF-Light – elemental chlorine free process), primary and secondary treatment of liquid effluents; sludge dewatering and treatment, and efficient emission control measures (e.g., collection and treatment of malodorous gases, efficient combustion control, electrostatic precipitators). The visual impacts related to the modification of the landscape will be minimized with the implementation of green barriers around the site.

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<sup>12</sup> Total reduced sulfur

<sup>13</sup> Volatile organic compounds

## **C. CUMULATIVE IMPACTS:**

- 5.9 There is no other industrial activity in a radius of 50 km of the Project site, therefore the only potential cumulative impacts that the Project may raise could be from the simultaneous construction and operation of the pulp mill, the road and the electric transmission line in the direct area of influence of the Project site, which will be assessed during the due diligence. Also cumulative impacts associated with air quality, aquatic environment and social changes (such as change in work patterns) will be assessed during the due diligence as there isn't information available at this stage. The due diligence will need to ensure that these impacts are fully delineated, and that mitigation measures are fully developed to minimize and manage this impact if necessary.

## **D FORESTRY PLANTATION**

- 5.10 The main potentially significant impacts of forestry plantations are soil compaction and erosion. Nonetheless, compaction impacts are highly localized (service roads, handling areas, logging decks) and erosion losses are limited by the reduction in surface run-off caused by the high density of planted trees in the plantations. Also, the sites will be harvested every eight to nine years, reducing soil erosion and compaction impacts compared to agricultural areas under an annual harvesting regime.
- 5.11 Other potential environmental impact of the plantations relate to surface water and groundwater management. The exact long term impacts of forestry plantations on groundwater are not well documented; however there are studies currently underway in Uruguay to determine the extent of potential cumulative impacts on water availability and take up. Some of those studies have compared water dynamics (in terms of final outflow volumes available for watershed recharge) between grassland and forestry plantations, and preliminary results over the last six years indicate that there are no significant differences between the two production systems. 5.12 Conversely, most of the Montes del Plata's existing plantations are dispersed around seven departments of Uruguay thus reducing the potential magnitude of the above described standard impacts associated with forestry plantations
- 5.12 There are also potential environmental impacts relating to development of new Eucalyptus plantations in rented lands belonging to independent producers. Specifically, the available information states that currently approximately 16,000 hectares are rented from local land owners, of which 6,000 hectares is already planted, leaving approximately 10,000 hectares of land previously used for subsistence and/or production (such as cattle grazing and various agricultural uses) which would be converted to growing eucalyptus trees. There is a risk of indirect impacts being generated by displacing existing crop and cattle activities to other regions, leading to land conversion. This could also induce potentially unsustainable livelihood practices for former subsistence or small-scale commercial farmers who will now concentrate on the production of a monocrop

with environmental risks for their land and/or economic risks due to their exposure to changes in the market or in Montes del Plata's demand. The exact nature of these impacts will need to be evaluated further during the environmental and social due diligence.

#### **E. ASSOCIATED FACILITIES**

- 5.13 Regarding the Associated Facilities and their impacts, there is currently little information. Assessments will be conducted during the due diligence stage.

#### **F. REPUTATIONAL RISK**

- 5.14 As emphasized by the description of the project's transboundary issues, there could be potential reputational risks associated with the involvement with this transaction. It could potentially create opposition from the local and international civil society. Pulp milling is a sensitive sector from the environmental and social point of view, particularly in Uruguay where it plays a central role in the country's economic development. Currently there is one pulp mill in Uruguay and one more pulp mill project under discussions with the government. IDB involvement in the sector without a clear sector strategic environmental assessment, legal analysis of the recent sector precedent and closely enforced communication strategy based on lessons learned from the sector's experience in the country in the last five years could increase the risk.

### **VI. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM**

- 6.1 In addition to the BAT criteria used for the project design standards (described in Annex A), the Project Company will implement environmental and social management systems, plans and procedures and monitoring programs to comply with the IFC pulp and paper standards and port, harbors and terminal guidelines, which go well beyond national regulatory requirements, and will comply with international norms such as ISO 14001: 2004, and OHSAS 18001:2007. Montes del Plata will aim to have an environmental, social and health and safety integrated management system.
- 6.2 Also, according to the Uruguayan regulations for the construction and operational phases of the project, the project proponents are required to submit detailed Environmental Management Plans (*Plan de Gestion Ambiental*, PGA) for approval. The plan for the construction phase has been developed and will be further assessed during the due diligence phase. The operations plan will be prepared and approved in advance of the start of operations; the Project implementation is expected to take 24 months and the estimated start-up of the pulp mill is projected for the end of 2012.

- 6.3 Montes del Plata has an information center “Casa Abierta” in Conchillas where information about the project is permanently available. The company also meets monthly with institutional stakeholders such as authorities, *juntas locales*, and with community stakeholders, such as the NGO *Amigos de Conchillas*. In order to continue building and expanding their stakeholder network, Montes del Plata will establish a consultative forum.
- 6.4 Besides the Environmental Management Plans, Montes del Plata is developing plans and strategies for “outside the fence” issues, such as: (i) promotion of local workforce with an analysis of local workforce availability and preparation of a training program; (ii) promotion of opportunities and development for local contractors; (iii) Mill visual aspects, contact was taken with architects in Brazil and Uruguay.

## **VII. ENVIRONMENTAL AND SOCIAL STRATEGY**

- 7.1 The focus for the environmental and social strategy for due diligence will be on ensuring a comprehensive understanding of the nature and extent of the environmental and social impacts and risks, ensuring that appropriate mitigation and management measures are designed for the project, and comprehensively and consistently implemented through the life of the project.
- 7.2 Of particular relevance is the assessment of impacts on the aquatic environment due to the dredging activities and material disposal for the construction of the port facilities and the navigation channel. Also the impacts of air emissions and effluents from the pulp mill installations and the biomass generation plant should be particularly analyzed to ensure that appropriate mitigation measures are in place. Other key impacts to be analyzed are the associated socioeconomic impacts as a result of the Project implementation in the area of Punta Pereira. Additionally a more thorough evaluation will be needed regarding the source and sustainability of raw material (forestry plantations) and its transportation to the Project site. In addition it must be ensured that the Company implements a comprehensive Environmental Management System to cover all of its operations,
- 7.3 The primary risks associated with the Project that need to be evaluated include the occupational health and safety risks, and, potentially, the risk of generating international disputes and/or protests from Argentinean and Uruguayan civil society organizations, given the association between the present project, the original ENCE proposal and the UPM ( formerly BOTNIA) project. If not managed adequately, this could potentially represent a reputational risk for the Bank. This risk can be reduced through the development and implementation of an effective communications and stakeholder engagement strategy.
- 7.4 The Project team, with the assistance of an independent environmental and social consultant will perform an environmental and social due diligence in order to confirm that all Project relevant impacts and risks have been, or will be properly



and adequately mitigated. The environmental and social due diligence will specifically assess the following aspects:

- a.** Assessment of compliance status with the applicable environmental, social, health and safety, and labor law requirements in Uruguay (e.g., laws, regulations, standards, permits, authorizations, applicable international treaties/conventions, etc.)—including their Environmental Impact Assessment requirements, project specific legal compliance.
- b.** Assessment of compliance with any applicable Bank environmental and social policy and guidelines, in particular the directives B.4 (other risks including Associated Facilities), B.10 (Hazardous Materials), B.11 (Pollution Prevention and Abatement); B.5 (Environmental Assessment Requirements), B.6 (Consultations), B(9) (Natural Habitats and Cultural Sites) of the Environmental and Safeguard Compliance Policy, the Public Disclosure Policy (OP-102) and the Disaster Risk Management Policy (OP-704).
- c.** Given the public sensitivities in Argentina to paper pulp mill projects in Uruguay, directive B.8 (Transboundary Impacts) will be evaluated thoroughly during the Environmental and Social Due Diligence. This assessment will include a review of the findings of the International Court at the Hague of the Botnia Project (now UPM) and of the international laws, treaties and agreements that govern the management of both the estuary of the Río de la Plata, (e.g. the *Comisión Administradora del Río de la Plata-CARP*).
- d.** Evaluation to confirm that the Project's direct, indirect and cumulative negative environmental and social impacts, from both construction and operation, have been properly identified and evaluated, in particular any impact on: water quality and associated impacts on marine environments; socioeconomic impacts as a result of the increase of population and services from the influx of workers, impacts from the decommissioning of a large number of construction workers, health and safety impacts.
- e.** Evaluation to confirm that the Project complies with: i) IFC's Environmental, Health, and Safety Guidelines for Pulp and Paper Mills and with ii) IFC's General EHS Guidelines and iii) IFC's Thermal Power Guidelines for the power plant.
- f.** Estimation of gross and net GHG emissions.
- g.** Assessment of potential archeological and cultural impacts. Available documentation includes, inter alia, ENCE's 2008 study.<sup>14</sup>
- h.** Evaluation of the potential impact to aquatic community structures as a result of alterations to the hydrodynamic conditions (geomorphology and

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<sup>14</sup> Lezama, Antonio (2008), "Estudio del Impacto Arqueológico y Cultural de la Instalación de una Fábrica de Celulosa y Planta de Energía Eléctrica en Punta Pereira, Colonia, Uruguay".

sediment movement patterns) in the area of indirect influence of the dredging work and port terminal, given that the coastal waters of the Rio de La Plata is a nursery area for juveniles of local fish and mollusk species. Also given that the water utilized for the plant will be extracted from the Rio de la Plata, it is necessary to evaluate that the water quality is consistent with generally accepted international criteria protective of terrestrial and aquatic resources.

- i.** Confirmation of the adequacy of the ESHS management systems, plans and procedures and monitoring programs planned for the Project's construction and operational phases. The system should adequately prevent, mitigate or control the environmental, health, safety and associated social impacts and address the environmental, health, safety and associated social risks (In particular, this will include, without limitation: (i) transportation and lodging of construction workers and the potential associated impacts in the hosting and nearby communities; (ii) labor practices; (iii) recruitment and procurement practices; (iv) community safety; (v) road and marine transportation impacts, risks and hazards; (vi) social communications and community relations; (vii) solid waste management; (viii) dredging specific construction methods; (ix) erosion control and landscape program; (x) air quality management and monitoring ; (xi) water quality and wastewater management; (xii) health and safety practices and procedures; (xiii) ESHS training, including periodical drills; among others.
- j.** Confirmation that adequate environmental, social health and safety plans and procedures will be established and implemented by the EPC contractors and its subcontractors to adequately address potential worker environmental, social, health and safety risks associated with the construction activities of the Project.
- k.** Assessment of the Montes del Plata communication strategy and/or stakeholder engagement plan.
- l.** Confirmation of the adequacy of the Project's contingency and emergency response plans and procedures to adequately address potential Project-related environmental contingencies and risks (i.e., accidental releases, explosions, fires, etc.) during construction and operational phase.
- m.** Evaluation of Project-related information disclosure and public consultation activities performed, and the proposed actions to provide adequate ongoing information disclosure and public consultation with the local population, in compliance with IDB's OP-703 and throughout the life of the loan.
- n.** Evaluation, and further development as necessary, of Project execution, monitoring, and supervision procedures to ensure proper implementation of environmental, social, and health and safety management plans and Bank requirements.

- o.** Analysis of the forestry management standards being applied by the company in its own plantations as well as for third parties. This will include a review of the of its management policy, procedures, instructions, plans, normative and monitoring programs in addition to its environmental management and plantation plans.
- p.** Analysis of the exact sources of timber, plantation sizes and management of independent sourcing, silviculture aspects, harvest, nursery, transport, and chipping mill processes.
- q.** Evaluation of the potential cumulative impacts of Montes del Plata replacing extensive plots of land from other agricultural practices to large scale eucalyptus plantations, based on on-going studies fostered by the company as well as independent expert opinion and other sources of information.
- r.** Assessment of corporate social responsibility programs and other initiatives developed by the project sponsor and their contractors to improve integration and relationship with the local communities.
- s.** Examine past, existing and/or future environmental, social, health, safety and labor risks and liabilities related to the Associated Facilities (expansion of the road 55, and construction of the electric transmission line).
- t.** Evaluate the possibility of the Bank's additionality by strengthening DINAMA's institutional capacity, in particular with a strategic environmental assessment of the pulp and paper sector to identify the cumulative impacts from the forestry plantations and associated pulp mills throughout the country.

7.5 As part of the Bank's environmental and social due-diligence, the Bank will prepare an Environmental and Social Management Report (ESMR) for consideration by the Bank's Environmental and Social Review (ESR) group. The ESMR will provide a synthesis of the relevant environmental, social, health, safety and labor aspects related to the Project and the proposed Bank recommendations.

## **Annex A**

### **Pulp and Paper Mills**

Paper is essentially a sheet of cellulose fibers with a number of added constituents to affect the quality of the sheet and its fitness for intended end use.

The pulp for papermaking may be produced from virgin fiber by chemical or mechanical means or by the re-pulping of recovered paper (RCF). In the pulping process the raw cellulose-bearing material is broken down into its individual fibers. Wood is the main raw material but straw, hemp, grass, cotton and other cellulose-bearing material can be used. The precise composition of wood will vary according to the type and species but the most important constituents are cellulose, hemicelluloses and lignin.

Wood naturally contains around 50% water and the solid fraction is typically about 45% cellulose, 25 % hemicelluloses and 25% lignin and 5% other organic and inorganic materials. In chemical pulping, chemicals are used to dissolve the lignin and free the fibers. The lignin and many other organic substances are thus put into solution from which the chemicals and the energy content of the lignin and other organics may be recovered. The extent of this recovery is dependent upon the chemical base used and the process configuration.

Pulps produced in different ways have different properties, which make them suited to particular products. Most pulp is produced for the purpose of subsequent manufacture of paper or paperboard. Some is destined for other uses such as thick fiberboard or products manufactured from dissolved cellulose.

#### ***Integrated Pollution Prevention and Control (EIPPC), and Best Available Techniques (BAT)***

Montes del Plata Project will comply with the recommendations of the European Commission on Integrated Pollution Prevention and Control (EIPPC) regarding Best Available Technologies for the paper and pulp industry.

This Commission has organized the exchange of information between Member States and the industries concerned on best available techniques (BAT), associated monitoring and developments in them and produces BAT reference documents (BREFs) which Member States are required to take into account when determining best available techniques.

A BREF should contain a number of elements leading up to the conclusions of what are considered to be "best available techniques" in a general sense for the sector concerned. BREFs do not prescribe techniques or emission limit values.

The term "best available techniques" is defined as "the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole." To clarify further this definition: a) "techniques" includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned; b) "available"

techniques are those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator; c) "best" means most effective in achieving a high general level of protection of the environment as a whole.

As a result of the EIPPC activity a reference document BAT has been prepared for the pulp and paper industry. The information can be found under the following link: [ftp://ftp.jrc.es/pub/eippcb/doc/ppm\\_bref\\_1201.pdf](ftp://ftp.jrc.es/pub/eippcb/doc/ppm_bref_1201.pdf)

**Elemental Chlorine Free (ECF)** is a bleaching sequence without the use of elemental chlorine<sup>1</sup> (chlorine gas, Cl<sub>2</sub>). In ECF chlorine dioxide is usually the main bleaching agent. The lignin removal by bleaching is carried out in several stages, the first two stages primarily releasing and extracting lignin and the subsequent stages stand for removing the lignin residues and finishing the product. A bleach plant consists of a sequence of separate bleaching stages with different chemicals or combination of chemicals added. The elemental chlorine can be replaced with chlorine dioxide in the bleaching stage, because the chlorine dioxide per chlorine atom has a fivefold oxidation power compared with chlorine and it has practically the same selective lignin removal properties. Reinforcing the alkaline extraction stages in bleaching with oxygen and/or hydrogen peroxide results in an enhanced oxidizing bleaching effect, which reduces the residual lignin content of the pulp before the final chlorine dioxide bleaching stages. Increasing the degree of chlorine dioxide substitution decreases the formation of chlorinated organic substances and eliminates the formation of dioxins, which are considered to have adverse environmental effects in the receiving waters.

**Totally Chlorine Free (TCF)** bleaching is a bleaching process carried out without any chlorine containing chemicals. In TCF-bleaching hydrogen peroxide together with ozone (Z) or peracetic acid (PA) are the most commonly used chemicals. Provided that the pulp has a low enough kappa number<sup>2</sup> after extended cooking and oxygen delignification and that transition metals (e.g. Mn<sup>2+</sup>) have been removed in the necessary chelating stages (Q-stages), it is possible to attain full market brightness with peroxide as the sole bleaching chemical. However, the dose-response curve for brightness versus peroxide consumption is quite shallow at top brightness, which means that even small disturbances in the incoming kappa number can cause rather high bleaching costs and downgrading of the pulp because of low brightness.

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<sup>1</sup> The use of elemental chlorine in pulp bleaching has been recognized as a source of dioxins and furans, and as a result the pulp industry has moved strongly away from the elemental chlorine bleaching technology in the last two decades.

<sup>2</sup> The number assigned according to the amount of residual lignin, or the de-lignification degree. A high Kappa number indicated high residual lignin in the pulp. The higher the kappa number the higher the use of bleaching chemicals

### ***Comparison between ECF and TCF Bleaching<sup>3</sup> :***

The ECF versus TCF question was recently examined by the Government Agency (RPDC) responsible for permitting new pulp mills in Tasmanian, Australia. The RPDC review was carried out in May 2006, and the report has more than 140 references, covering, experiences in North America, Europe and South America, The report concluded that TCF pulp and ECF have similar environmental impacts from air and water emission, and neither emits dioxins at environmentally significant levels. The report also concluded that TCF pulps generally have poorer strength at equivalent brightness, and lower yields than comparative ECF pulps. Neither technology offers significant advantages in terms of operating risk, safety and occupational health consideration. Both technologies are acceptable under the Stockholm Convention of POP's, PPC—BAT, USEPA and all significant permitting authorities.

***Elemental Chlorine Free Light (ECF-Light)*** Montes del Plata's pulp mill process will have a low consumption of chlorine dioxide (less than 10 Kg/ADT), and an efficient process of bleaching with oxygen and hydrogen peroxide; therefore the bleach plant can be considered "ECF-Light", An ECF-light technology essentially has attributes of both ECF and TCF production. The expected color, COD<sup>4</sup> and AOX<sup>5</sup> discharges from the bleach plants are subsequently expected to be extremely low compared to conventionally bleached pulp mills and will not produce dioxin and furans at significant levels.

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<sup>3</sup> Extract from the Cumulative Impact Study-Uruguayan Pulp Mills , IFC , September 2006

<sup>4</sup> Chemical Oxygen Demand

<sup>5</sup> Absorbable Organic Halogens

## Annex B

### Figures

Satellite picture of the Project site



## Punta Pereira and Rio de la Plata





Pictures of the Project site at Punta Pereira

