

## EXECUTIVE SUMMARY

### Overview

Botnia S.A. (Botnia) is developing the Orion project alongside the Río Uruguay approximately 5 km upstream (east) of the city of Fray Bentos in Uruguay. The project consists of a bleached Kraft pulp mill (the mill) designed to produce approximately 1,000,000 air dried tons of pulp on an annual basis (ADt/a). The wood will be sourced from established eucalyptus plantations within western and central-north Uruguay.

Botnia has prepared and publicly disclosed an environmental and social impact assessment (EIA) for the Orion project that describes the expected impacts of the project and the mitigation and enhancement measures to manage those impacts.

The potential environmental and social impacts for the Orion project were also independently assessed and verified through a Cumulative Impact Study (CIS) commissioned by the International Finance Corporation (IFC). The CIS was completed in September 2006 by EcoMetrix Incorporated (EcoMetrix) and its consultants, SENES Consultants Limited (SENES) and Processys Incorporated (Processys). The CIS can be considered to have overstated the potential impacts since it was an assessment reviewing the combined environmental and social impacts for the Orion project and a second proposed pulp mill near Fray Bentos to have been built by ENCE (CMB) and since relocated.

### Environmental and Social Action Plan (ESAP)

To ensure that the key recommendations of these impact assessments are appropriately implemented, Botnia and IFC prepared and agreed on an Environmental and Social Action Plan (ESAP) for the Orion project. A copy of the most recent version of the ESAP is available at the respective websites of Botnia and the IFC:

[www.metsabotnia.com/es/default.asp?path=284,1530,1329,1056](http://www.metsabotnia.com/es/default.asp?path=284,1530,1329,1056)

[www.ifc.org/ifcext/lac.nsf/Content/Uruguay\\_PulpMills\\_Background\\_Docs](http://www.ifc.org/ifcext/lac.nsf/Content/Uruguay_PulpMills_Background_Docs)

The ESAP identifies 16 specific actions relating to the following: 1. ISO certification; 2. hazardous materials; 3. emergency preparedness and response; 4. transportation; 5. community development; 6. conservation; 7. solid waste; 8. groundwater monitoring; 9. independent verification of process and preparedness; 10. independent monitoring of environmental and social performance; 11. plantations; 12. public grievance; 13. public disclosure; 14. municipal water supply; 15. municipal wastewater; and 16. chemical recovery of black liquor from Pamer Papelera Mercedes S.A..

### Purpose of Report

This report addresses Action No. 10, Independent Monitoring of Environmental and Social Performance. It is the first of four reports that will be issued over the next two years to monitor the performance of the Orion project. The main purposes of this first report are:

1. to review the environmental, health, safety and social monitoring program to verify that it has been designed according to plan and serves the purpose of stakeholders;
2. to review the progress of Botnia in meeting commitments detailed in the ESAP.

This first report was prepared prior to commissioning of the mill. Subsequent reports will be prepared post-commissioning to review the environmental and social monitoring data through the first two years of operation. These reviews will provide an assessment of the actual environmental effects as compared to those predicted in the EIA and CIS.

## **Methodology**

The review presented herein is based on first-hand observation, and an evaluation of the information made available by Botnia, DINAMA, IFC and other relevant sources at the time of preparation. The principle sources of documented information include the following management plans and associated annexes: plan de gestión ambiental de operación; plano general de la fábrica; plan de implementación de medidas de mitigación y compensación; plan de monitoreo y seguimiento del medio ambiente; plan de monitoreo y seguimiento de la operación; Análisis de riesgos ambientales; plan de contingencias; plan de autoprotección; plan de gestión de residuos sólidos; and plan de gestión ambiental para la operación de la terminal portuaria. A series of other supporting documents were also provided as listed within the relevant section of this review.

This review does not seek to document the various details associated with each of these plans. The reader is referred to the original documentation for further detail. This review also does not constitute an official certification of the completeness and adequacy of these various plans and documents but rather the professional judgment of the consultant team based on extensive experience evaluating the environmental and social impacts of pulp mills.

The review is also based on observations made and information gathered by the EcoMetrix team during a site visit in August 2007. This site visit was conducted by Bruce Rodgers, M.Sc., P.Eng., and Gwen Brice, B.Sc. Mr. Rodgers was the Project Manager for the EcoMetrix team during the preparation of the CIS, and Ms. Brice was a Senior Advisor responsible for the socio-economic assessment of the CIS. Audrey Armour, Ph.D., served as an advisor on matters pertaining to social assessment, and Daryl Cowell, M.Sc., advised on matters pertaining to the plantation and groundwater monitoring.

## **Status of the ESAP**

The status of Botnia's ESAP is summarized in Table ES-1. Actions that are complete include:

- Action No. 2., Hazardous materials management plan;
- Action No. 3., Emergency preparedness and response plan;
- Action No. 4., Transportation management plan;
- Action No. 5., Community development plan;
- Action No. 6., Conservation plan;
- Action No. 7., Solid waste management plan;
- Action No. 8., Ground water monitoring plan;
- Action No. 9., Independent verification of process and preparedness;
- Action No. 10., Independent monitoring of environmental and social performance;
- Action No. 11., Plantations operations and management;
- Action No. 12., Public grievance mechanism;
- Action No. 13., Public disclosure plan;
- Action No. 14., Municipal water supply.

The remaining Actions are proceeding according to the original schedule which extends beyond the commissioning of the mill. These Actions include:

- Action No. 1., ISO Certification;
- Action No.15., Municipal wastewater;
- Action No. 16., Chemical recovery of black liquor from Pamer Papelera Mercedes S.A..

In many cases, the minimum requirements identified in the ESAP have been exceeded. Most notably is the scheduled construction of a highway overpass along Route 2 to alleviate potential traffic congestion. In a few cases, additional actions will be undertaken to ensure the intended outcome of the ESAP. These actions include the following:

- Hazardous materials management plan – Within 12-months of start-up, Botnia will extend the qualitative assessment of potential risks to a quantitative assessment for those incidents having the potential to seriously harm the ambient environment;
- Transportation plan – Botnia acknowledges the need for upgrade of the rail system to modern safety standards, and will advocate such upgrades are in place or being implemented prior to a sustained increase in rail shipments of wood to the plant;
- Solid waste management plan – Botnia will continue to support the local municipality in the design of an improved or new landfill; and Botnia will notify and agree with the IFC regarding the final destination of any hazardous waste material to ensure that the disposal of such waste is consistent with international best practice;
- Groundwater monitoring plan – Botnia will continue to collect and interpret results from current monitoring sites; and, in consultation with IFC, Botnia will undertake additional environmental and social risk-based assessment which will inform any expansion or modification of the ongoing monitoring program;
- Independent monitoring of environmental and social performance – Botnia will incorporate the following into their environmental monitoring program: periodic testing of acute and chronic toxicity of the final effluent; an effluent plume delineation study following start-up of the mill; and the implementation of a mobile TRS detector for monitoring in areas of potential concern, such as the international bridge;
- Public grievance mechanism – Within 30-days of start-up, Botnia will engage DINAMA and the Comisión de Seguimiento for the purpose of defining an approach to handling serious or particularly sensitive grievances unresolved through the established call-in mechanism;
- Public disclosure plan – Botnia will measure TRS levels at the monitoring station between the mill and the city, and will display these measurements in real-time on a digital display at their office in Fray Bentos.

### **Status of the Environmental Monitoring Program**

Separate environmental monitoring programs have been developed by Botnia and DINAMA. Details of these monitoring programs are presented under Action 10, Independent monitoring of environmental and social performance.

Overall, these monitoring programs are extremely comprehensive and exceed the commitments identified in the CIS. The programs includes monitoring of mill effluent, mill air emissions, water quality, sediment quality, biological indicators (plankton, invertebrates, fish), meteorological parameters, air quality, air inversions, groundwater, soil quality, and terrestrial indicators (flora and fauna). Collectively, these monitoring components will provide a quantifiable record of the source emissions (effluent, air), media response (water, air, soil, and groundwater) and biological response (aquatic animals, flora and fauna).

Components of the monitoring program follow well established protocols which will aid in design, analysis and interpretation. For example, the monitoring programs for water quality, sediment quality and biological indicators are similar to the Environmental Effects Monitoring (EEM) program required for pulp and paper mills in Canada. This EEM program has been in effect since the early 1990's and provides well established technical guidance for implementation of the program and analysis of monitoring data. It also provides a comprehensive database to support the interpretation of the monitoring results.

Other components of the monitoring program are without precedent and therefore must be interpreted with considerable caution. In particular, the proposed monitoring of bee behavior and honey quality has the potential for misinterpretation since many factors beyond the influence of the mill could affect these indicators.

The monitoring program should be reviewed periodically to ensure that it is providing accurate and meaningful information.

### **Status of the Social Monitoring Program**

Botnia has conducted semi-annual monitoring of social impacts of the project through the construction phase and will continue into the operational phase. The monitoring program is comprehensive and has been able to measure meaningful data on how the project has affected the city of Fray Bentos and surrounding communities. The latest monitoring results are reviewed under Action 10, Independent monitoring of environmental and social performance.

The social monitoring program has shown that Botnia has been very mindful of their responsibility to the community. They have invested in infrastructure, resources, programs, and business partnerships. They have also been mindful of the needs of the construction workforce in terms of providing transportation from neighboring communities, housing and other accommodation, on-site catering, and on-site medical services to name a few. This has alleviated many of the potential negative effects during the construction phase.

Many of the most serious concerns and fears associated with a large and predominately imported workforce do not appear to have materialized during the construction phase. Generally, stakeholders that were interviewed felt integration of foreigners into the community occurred without too much friction or negative effect.

The community has been experiencing the boom phase of the project given the relatively large workforce during the construction phase. The pending transition to the operation phase will result in a stabilization of the workforce and servicing requirements. Similar to the boom-bust cycle of the former Anglo meat packing plant, loss of employment and loss of income may potentially lead to out-migration of workers looking for employment. Efforts have been made to train local Uruguayans for the operation phase through first hand training and experience at similar facilities in Finland.

First-hand observation indicates that the mill appears to have generated considerable prosperity in the community with new restaurants, hotels, art galleries, shops and businesses in evidence. It was common to hear from stakeholders how the quality of life has improved in Fray Bentos and surrounding communities. These communities are enjoying a boom scenario as a result of the construction phase.

Beyond the direct benefits provided by the project, the establishment of the Botnia Foundation should support additional indirect benefits as a result of the mill's presence as well as through company sponsorship of various educational and quality of life programs.

Although Botnia has provided many benefits to the surrounding communities, community expectations have been growing. Consequently, some stakeholders believe Botnia should be responsible for providing additional indirect projects, and expressed some disappointment with unmet expectations. Botnia will be challenged with managing these expectations and will need to clearly state the scope of their community contributions.

**Table ES-1: Status of Botnia’s Environmental and Social Action Plan**

Action	Description, Status and Additional Commitments
<p><b>1. ISO Certification</b></p>	<p><b>Description:</b> BOTNIA will establish an integrated system for the management of environmental and occupational health and safety performance of the mill and supply chain operators that will qualify for ISO certification.</p> <p><b>Status:</b> Action proceeding as scheduled.</p>
<p><b>2. Hazardous Materials Management Plan</b></p>	<p><b>Description:</b> Developed and implement a Hazardous Material Management Plan as specified in IFC guidelines.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Within 12-months of start-up, Botnia will extend the qualitative assessment of potential risks to a quantitative assessment for those incidents having the potential to seriously harm the ambient environment.</p>
<p><b>3. Emergency Preparedness and Response Plan</b></p>	<p><b>Description:</b> Implement an Emergency Preparedness and Response Plan that applies to mill and supply chain operations.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> See additional commitment from Action No. 2.</p>
<p><b>4. Transportation Management Plan</b></p>	<p><b>Description:</b> Prepare and implement a Transport Management Plan that covers the movement of wood, pulp and process supplies via road and river.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Botnia acknowledges the need for upgrade of the rail system to modern safety standards, and will advocate such upgrades are in place or being implemented prior to a sustained increase in rail shipments of wood to the plant.</p>
<p><b>5. Community Development Plan</b></p>	<p><b>Description:</b> Prepare and implement a community development plan that encompasses the project area of influence inclusive of plantation operations.</p> <p><b>Status:</b> Action complete.</p>
<p><b>6. Conservation Plan (Mafalda Project)</b></p>	<p><b>Description:</b> Prepare and implement a detailed plan for conservation set aside required by DINAMA.</p> <p><b>Status:</b> Action complete.</p>
<p><b>7. Solid Waste Management Plan</b></p>	<p><b>Description:</b> Prepare and implement detailed design and operational procedures for solid waste management.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Botnia will continue to support the local municipality in the design of an improved or new landfill; and Botnia will notify and agree with the IFC regarding the final destination of any hazardous waste material to ensure that the disposal of such waste is consistent with international best practice.</p>

Action	Description, Status and Additional Commitments
<p><b>8. Ground Water Monitoring Plan</b></p>	<p><b>Description:</b> Prepare and implement a groundwater monitoring program for plantations operated by Forestal Oriental.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Botnia will continue to collect and interpret results from current monitoring sites; and, in consultation with IFC, Botnia will undertake additional environmental and social risk-based assessment which will inform any expansion or modification of the ongoing monitoring program.</p>
<p><b>9. Independent Verification of Process and Preparedness</b></p>	<p><b>Description:</b> Engage consultants acceptable to IFC to provide:</p> <ol style="list-style-type: none"> <li>1. Independent verification that the mill has been constructed as described in the EcoMetrix Cumulative Impact Study (i.e., to meet EU IPPC BREF standards of performance for Kraft Pulp Mills); and</li> <li>2. Confirm the preparedness of the mill to commence operations prior to start-up.</li> </ol> <p><b>Status:</b> Action complete.</p>
<p><b>10. Independent Monitoring of Environmental and Social Performance</b></p>	<p><b>Description:</b> Engage consultants acceptable to IFC to:</p> <ol style="list-style-type: none"> <li>1. Undertake independent monitoring of the environmental, health, safety and social performance of the mill operations as recommended in the Hatfield and Cumulative Impact Study reports;</li> <li>2. Assess the performance of the mill operator in meeting commitments detailed in the ESAP.</li> </ol> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Botnia will incorporate the following into their environmental monitoring program: periodic testing of acute and chronic toxicity of the final effluent; an effluent plume delineation study following start-up of the mill; and the implementation of a mobile TRS detector for monitoring in areas of potential concern, such as the international bridge.</p>
<p><b>11. Plantation Operations and Management</b></p>	<p><b>Description:</b> Obtain and maintain certification that forest plantation operations are managed in a manner consistent with internationally recognized standards for environmentally and socially sustainable forest management.</p> <p><b>Status:</b> Action complete.</p>
<p><b>12. Public Grievance Mechanism</b></p>	<p><b>Description:</b> Establish a public grievance mechanism for the mill and supply chain operations.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Within 30-days of start-up, Botnia will engage DINAMA and the Comisión de Seguimiento for the purpose of defining an approach to handling serious or particularly sensitive grievances unresolved through the established call-in mechanism.</p>
<p><b>13. Public Disclosure Plan</b></p>	<p><b>Description:</b> Establish a process for the dissemination and public disclosure of the mill's environmental performance monitoring information.</p> <p><b>Status:</b> Action complete with additional commitments.</p> <p><b>Additional Commitments:</b> Botnia will measure TRS levels at the monitoring station between the mill and the city, and will display these measurements in real-time on a digital display at their office in Fray Bentos.</p>

Action	Description, Status and Additional Commitments
<b>14. Relocation of Fray Bentos Municipal Water Supply Intake</b>	<b>Description:</b> Prepare and implement a detailed plan for the relocation of the Fray Bentos municipal water intake as agreed with the municipality and concerned central government agencies. <b>Status:</b> Action complete.
<b>15. Treatment and Discharge of Fray Bentos Municipal Wastewater</b>	<b>Description:</b> Prepare and implement a detailed plan for the treatment and discharge of the Fray Bentos municipal wastewater. <b>Status:</b> Action proceeding as scheduled.
<b>16. Chemical Recovery of Black Liquor from Pamer Papelera Mercedes S.A.</b>	<b>Description:</b> Prepare and implement detailed plan for the chemical recovery of the black liquor generated by the paper mill at Mercedes (Pamer). <b>Status:</b> Action proceeding as scheduled.