THE ASSESSMENT OF THE ENVIRONMENTAL IMPACT AND THE INTEGRATED ENVIRONMENTAL PERMIT OF THE ASPEN PULP PLANT TO BE CONSTRUCTED AT KUNDA BY AS ESTONIAN CELL

EXECUTIVE SUMMARY

1 Introduction

AS Estonian Cell is planning to construct a greenfield aspen pulp plant (hereinafter "the Plant") in the eastern part of Kunda, Lääne-Virumaa, Estonia. An environmental impact assessment (EIA) of the proposed development has been carried out in accordance with Estonian Environmental Impact Assessment and Environmental Auditing Act (2000) and the EIA programme approved by the Ministry of the Environment on 29.07.2002.

The EIA has been prepared in respect of the technical design project of the Plant. The environmental impact is primarily assessed at the Liiva Land Unit (34501:008:0015) in Kunda, where the Plant is planned to be constructed, together with the territory of Raudkatku 1 (34501:008:0002) and Raudkatku 3 (34501:008:0070) Land Units. The marine waters around the projected wastewater deep-outlet were also covered by the scope of the EIA.
The area of the foreseen building plot is 798,038 m^2 and its address is Jaama street 21, 44106 Kunda. Alternative locations (Kehra, Türi, Kunda) and conditions of the Plant have been analysed and compared. The presence or absence of possible transboundary environmental impact have also been assessed in the course of the EIA.

The EIA has been carried out by independent Estonian environmental impact assessment company, OÜ Ecoman, who has involved recognised Estonian experts in the field. In the course of the assessment, data from plans, projects, technological processes and specialist literature have been analysed in addition to expert opinions. Model calculations have been used and laboratory tests and analyses have been conducted in the assessment of material environmental impacts (ambient air emissions, wastewater purification processes, impact on the sea ecosystem). The objective of this Executive Summary is to provide a non-technical summary of the EIA and the integrated environmental permit (hereinafter "the integrated permit") issued for the construction and operation of the Plant.

2 Existing environmental conditions of the affected area

The area affected by the activity of the Plant covers the territory of the aforementioned Liiva Land Unit where the Plant is planned to be constructed, the lower course of the Kunda River, the marine waters around the purified wastewater deep-sea outlet close to the Mahu area, the bordering coastal sea, the bordering part of the Gulf of Finland, the area of the pipeline utility network and the likely area affected by emissions from the Plant into the ambient air.

In the course of a strategic environmental impact assessment, OÜ Eesti Metsakorralduskeskus conducted an evaluation of the nature values of the site. According to the planning and the strategic EIA, the territory of the Land Unit is divided into:

- natural green area, including a high-value habitat in the northern part of the Land Unit, 52%;
- industrial building land divided into a building area and a prohibited construction area, 45%;
- land under the water purification building, 3%.

Of the forest area, 21.6 ha of land are classified as high-quality habitats and 14.5 ha have a high natural value. In addition, 5.3 ha of land are designated as a buffer zone of the high-value habitats. In the high-value habitat areas no economic activity is permitted for reasons related to the preservation of nature values. No important nature values have been registered in the southern part of the remaining 16.2 ha of forest land, which was earlier a meadow with scattered trees. As a result of a study of the vegetation of the production land, no protected species of plants or ecosystems to be registered as key biotopes were detected.

Soil investigations have been conducted in the sea close to the Letipea Cape to determine the content of petroleum products and heavy metals. According to a visual assessment, no soil pollution was detected. The soil sample analyses showed that the content of petroleum products was below established limit values. Also, the levels of heavy metals (Cd, Cr, Cu, Hg, Ni, Pb, Zi) were significantly below the established limit values. The results of the investigations can also be used as representative data regarding the soil conditions at the contemplated location of the wastewater pipeline.

In the west, the Land Unit is bordered by the Kunda River valley together with the Kunda River. According to latest studies, the general condition of the river is good. Kunda River is a habitat and its lower course is the spawning place for a number of valuable fish species, such as salmon, sea and river trout and grayling. The river is particularly fish and species-rich in its rapidly flowing part at the river mouth.

The ambient air quality in Kunda Town area is affected by air emissions from other enterprises operating in the region. The most significant air pollution is caused by a cement production plant (AS Kunda Nordic Tsement), which has a dominant role in shaping the background pollution levels in the region, although it has significantly reduced its air emissions over the recent years (dust, three times; SO_2, more than ten times).

3 Project description

AS Estonian Cell plans to reach to 140 000 tonnes of aspen pulp as an annual production of the Plant. A contemporary environment-friendly technology will be used in the production – the Bleached Chemi-Thermo-Mechanical Pulp (BCTMP) technology, which, in the form to be used at Kunda, conforms to the requirements of the Estonian Integrated Pollution Prevention and Control Act (2001), which prescribes the conditions for the use of the best available technique in applying for an integrated environmental permit, as well as to international requirements for the best available techniques (BAT). The plant's technology has been chosen for the purpose of using aspen, which will contribute to the more effective use of aspen stands (forests) that have not been used for a long time in Estonia. The chosen technology will allow the use of low-quality aspen that has not been used much for years and will thereby promote the management of aspen stands primarily in private forest land where a majority of forests with communities of aspen grow.

The construction of the aspen plant is partly an alternative to the former idea of building a cellulose plant in Estonia. The idea was to produce up to 600 thousand tons of cellulose using for the purpose mainly coniferous wood of up to 2 million cubic metres per year. In comparison with sulphate and sulphite cellulose (the technologies used earlier in Estonia and at present at Kehra), no foul-smelling sulphur organic compounds (mercaptanes, sulphites) characteristic of the sulphate cellulose technology are formed in the Plant because aspen does not contain terpenes like coniferous wood and impregnation chemicals used in the BCTMP process do not contain reduced sulphur compounds. Aspen pulp can be easily bleached to a high level of whiteness (85%) in soft conditions, using only hydrogen peroxide as an active chemical. For this reason, the chosen technology is significantly different from chemical cellulose bleaching where the achievement of a high level of whiteness necessitates the use of chlorine compounds resulting in the creation of wastewater containing toxic chlorine organic compounds.

The production process comprises the following stages: the supply of wood, barking (dry)-chipping-chip washing-impregnation-refining-screening-bleaching-drying and the packing of the finished product. It has been planned to use in the Plant up to 400 thousand cubic metres of aspen, up to 2.4 million m³ of process water, up to 16 million Nm³ of natural gas and up to 250 GWh of electricity per year. Sodium hydroxide and hydrogen peroxide are used as impregnation chemicals and hydrogen peroxide as the bleaching chemical. The water used at all stages of the technological process is in constant circulation, allowing reasonably low specific water consumption – *ca* 17 m^3 per tonne of pulp (BAT 10-20 m³). The purification of wastewater takes place in an activated sludge process, based on aerobic biological treatment technology. Natural gas will be used for heat generation in two technological installations: a flash drier and a steam boiler. The specific energy consumption is *ca* 1800 kWh per 1 tonne of pulp (the BAT value is determined at 3000 kWh /t).

The construction works are to be carried out within 24 months. The exterior architecture of the buildings conforms to the contemporary standards for industrial buildings. The production complex comprises the production unit (with the height of 24.5 m, the height of the chimney of the flash drier being 33 m), the barking unit, the boiler house, warehouse for the finished products and the wood landing. The finished product is aspen pulp that can be used for the manufacture of high- quality paper, millboard and cardboard. The finished product will be exported. The estimated cost of the plant is *ca* 2 billion EEK.

4 Significant environmental and health and safety impacts

There will be a significant **environmental impact on the production territory** where the changes in the relief and the construction of extensive timber landings will bring about changes in the surface water regime. The measures foreseen in the plant's technical draft project create a precondition that the surface water dispersion system to be constructed together with the drainage system of the industrial territory will ensure the preservation of high-value plants (forest types) in the northern part of the real estate property. The protection of the Kunda River protection zone of 200 m and of the surroundings of the tree groups (oaks) growing within the territory of the construction area will be ensured.

The level of noise at the periphery of the Plant may at certain times exceed the limit value of 55 dB and such noise may extend as far as 300 m of the production building and the barking shop. The noise is likely to disturb residents of houses in Jõe Street located in the south-west of the plant's territory. If measures are taken to improve the greenery (plantation of coniferous

trees, improvement of the shrub front) and technical measures, such as triple glasses on windows, are applied, it is possible to ensure the permissible night noise level also inside. Necessary measures will be determined and, if necessary, implemented on the basis of measurements of the level of noise to be carried out during a period after taking the plant into operation.

The impact of the extraction of the plant's process water from the Kunda River on the water resources in the lower course of the river from the first dam up to the sea is considered negligible. The process water demand of the Plant (up to 2.4 million m^3 per year or up to 350 m^3/h) is assessed to be negligible compared with the annual assessed average water amount in Kunda River at the location of the water inlet (6.2 m^3/s). Therefore, it has been assessed that the extraction of process water does not have a significant effect on the water resources of the river or on the spawning conditions of fish at the lower course of the river.

Wastewater will be purified in an activated sludge treatment process, widely used and proven in practice in the pulp and cellulose production. Purified wastewater conforms to the levels recommended by the IPPC with regard to all parameters. The concentration of COD in wastewater (1250 mg/l) exceeds the permissible level established in Estonia (250 mg/l) but is compensated for by the degree of purification of wastewater, which is 86% – 88% (the established value is 75%), and is, therefore, in conformity with the Estonian legislation.

Rainwater and water created as a result of the drainage of the plant's territory will be collected and conducted through the rain water sewerage system to the purification installations consisting of bar screens and open ditches. Purified water will be discharged without changing the water regime of the surrounding forest.

The **discharge of purified wastewater into the sea** through the deep-sea outlet does not have a significant effect on the sea environment of the outlet surroundings according to the model studies conducted by the Maritime Systems Institute of the Tallinn Technical University. The impact has been assessed to be local and is confined to the immediate vicinity of the sea outlet and will not affect the water area of the Letipea protected area nor the beach of the Letipea Village. The wastewater discharge will not cause significant adverse transboundary impacts.

The level of pollutants emitted into the ambient air conforms to the best available technique (BAT) standards and to the limit values applicable in Estonia with regard to any parameter. The concentration of ambient air emissions on the border of the plant's territory is *ca* 0.2 SPV (SPV – pollution level limit value). Therefore, the pulp plant to be constructed will not have a significant impact on the ambient air of the surrounding areas. Also the combined effect of air pollution with other sources located in Kunda (mainly AS Kunda Nordic Tsement) remains within the permitted limits. Emissions into the ambient air do not have any significant adverse transboundary impact.

The necessary **aspen resources** are available in Estonia and the more intensive use of aspen will have a favourable effect on the management of aspen forests. The area under aspen forests is 115,900 ha and the growing forest resources are 37.2 million m³. The current volume increment is 800 thousand/m³ per year.

Solid waste will be either recycled or disposed of in accordance with regulatory requirements. The majority of the waste is bark and wood processing residues (sawdust, chips), which will be stored in or outside the production territory and then sold to be used as fuel, part of it may

be composted; residual sludge from the wastewater treatment plant and the residues from the treatment of technological water will be composted; hazardous waste and municipal waste management will be outsourced to licensed companies; used oils will be collected into the waste storage facility located in the garage complex and will be sold to a concrete company. Waste handling will not have a significant effect on the environment outside the plant's territory.

Chemicals will be stored in steel, plastic or RGP containers of 3 – 250 m³ partially surrounded by a concrete secondary containment. Any possible leakage of chemicals is to be removed with the help of pumps operating automatically.

The construction of the plant will have a significant positive **socio-economic impact** (in accordance with the Sustainable Development Act) by creating direct jobs for 70 persons (in addition to indirect employment to *ca* 300 persons) and by promoting the management of aspen forests. On the processing of aspen into pulp, the resulting gross domestic product will surpass by several times the GDP obtained from the export of round wood.

5 Mitigation of significant environmental impacts

The EIA process has resulted in the following recommendations for mitigating the significant impacts of the construction and operation of the Plant:

(1) Preservation of the water regime of the valuable forest growing in the north of the land unit. A drainage system will be provided to ensure the local drainage of the territory and the preservation of water (water reservoir) and its spreading to the territory of the key biotope located in the north will not change so that the valuable ecosystems are affected significantly.
(2) Forest protection measures and forest management works will be applied to ensure the protection of the valuable forest (key biotope) located in the north of the Liiva Land Unit and the maximum preservation of the water regime.
(3) Noise abatement measures, for example, the construction of relevant technical facilities (noise barriers) in the vicinity of the Plant's main sources of noise, will be sought for bringing the level of noise into conformity with the applicable standards, if it becomes evident in the course of operation of the plant that the level of noise in the residential district of Jõe street, Kunda Town does not conform to the requirements.
(4) When designing the final location of the utility network pipeline for wastewater, regard should be given to the borders and the applicable regulations of the Letipea nature protection area and to ensure taking account of the legitimate interests of landowners. The wastewater deep-sea outlet will be located at least 10m below the surface of the sea;
(5) If it becomes evident in the course of monitoring that the bottom flora and fauna have been affected to a significant effect and that the spawning conditions of fish have deteriorated, the programme for the restoring fish resources (in particular with regard to salmon and sea trout) will be taken part in;
(6) In addition to compliance with the requirements of legislation, measures to prevent the use of illegally obtained wood as a raw material for the plant will be applied. In co-operation with wood suppliers, measures for promoting sustainable and environmentally friendly forest management will be applied;
(7) An environmental management system will be established and implemented in accordance with the requirements of the ISO 14001 standard to reduce a continuous environmental effect and to prevent accidents.

(8) Employees working on the composting grounds will be provided with special clothing and equipment to reduce the possible harmful effect of emissions emitted in the course of the composting process (including allergens);
(9) Procedures for the prevention of accidents and for action in the event of accidents and regulations for internal fire safety will be established.
(10) In the event of possible accidents, supervisory and local government authorities will be promptly informed thereof, risks will be evaluated and, as a result, the production process will be suspended or stopped, if necessary.

6 Outline of Environmental Monitoring Plan

The EIA has resulted in recommendations for specific monitoring of the potentially significant environmental impacts of the construction and operation of the plant. These include:

(1) After the completion of the construction work, a balance of the water conducted away and used for the preservation of the water regime of the key biotope should be prepared;
(2) Monitor the amount of water of the Kunda River;
(3) Ambient air should be monitored in accordance with the specifications set forth in the environmental permits; it is advisable to co-operate with other enterprises of Kunda emitting pollutants and to use the assistance of independent experts;
(4) In the region of the wastewater deep-sea outlet, it is necessary to arrange the determination of the pollution load of the emitted wastewater and evaluation of the effect of wastewater on the marine flora and fauna surrounding the deep-sea outlet;
(5) The monitoring of the deep-sea outlet should also include periodical measurements of the quality of the sea water (optical properties, the amount and content of plankton, the chemical indicators of the sea, the oxygen content in bottom sediments and in the water layer near the bottom of the sea) and determination of changes in the species structure and in the spread of natural communities at the bottom of the sea (flora and fauna) and fish fauna, and investigation of the reasons.

The integrated permit sets out several specified conditions for monitoring of the emissions of the Plant and the environmental impact of such emissions.

7 Public consultation and interaction

A public consultation process associated with the EIA was carried out in accordance with the Estonian Environmental Impact Assessment and Environmental Auditing Act and consisted of the following:

1. A notice regarding the launching of and public meeting in respect of the EIA was published in the *Ametlikud Teadaanded (Official Journal)* on 3 July 2002;
2. The EIA programme was available for examination from 3 July 2002 at Kunda Town Government, Koidu tn 9A, Kunda;
3. A public meeting in respect of the EIA programme was held on 19 July 2002 at Kunda Town Government, Koidu tn 9A, Kunda;
4. A notice regarding the completion of and public meeting in respect of the EIA report was published in *Ametlikud Teadaanded* on 7 August 2002;
5. The EIA report was available for examination from 7 August 2002 at Kunda Town Government, Koidu tn 9A, Kunda;

6. A public meeting in respect of the EIA report was held on 23 August 2002 at Kunda Recreation Club, Lasteaia 4, Kunda;
7. A notice regarding the issue of the building permit of the Plant was published in *Ametlikud Teadaanded* on 10 October 2002.

A public consultation process was also carried out in the course of the issue of the integrated permit in accordance with the Integrated Pollution Prevention and Control Act. Such process included the following:

1. A notice regarding the submission of an application for the integrated permit, public disclosure of such application and the related public meeting was published in *Ametlikud Teadaanded* on 14 November 2002;
2. The application for the integrated permit was available for examination from 14 November 2002 at Lääne-Virumaa Environmental Service, Kunderi 18, Rakvere;
3. A notice regarding the public disclosure of the draft integrated permit and the related public meeting was published in *Ametlikud Teadaanded* on 28 November 2002;
4. The draft integrated permit was available for examination from 29 November 2002 at Lääne-Virumaa Environmental Service, Kunderi 18, Rakvere;
5. A public meeting in respect of the draft integrated permit was held on 17 December 2002 at Lääne-Virumaa Environmental Service, Kunderi 18, Rakvere;
6. A notice regarding the issue of the integrated permit was published in *Ametlikud Teadaanded* on 3 January 2003.

A public consultation process was applied in the course of the procedure that had been carried out for amending the integrated permit. Such process included the following:

1. A notice regarding the submission of a request to amend the integrated permit and public disclosure of such request was published in *Ametlikud Teadaanded* on 27 February 2003;
2. The request to amend the integrated permit was available for examination from 27 February 2003 at Lääne-Virumaa Environmental Service, Kunderi 18, Rakvere;
3. A notice regarding the amendments to the integrated permit was published in *Ametlikud Teadaanded* on 30 April 2003.

A public meeting in respect of the new location of the wastewater pipeline was held on 10 April 2003 at Mahu village, Viru-Nigula Rural Municipality. Such public meeting was organised before the adoption of a part of the comprehensive plan which determines the location of the pipeline in the coastal area.

Also, several articles regarding the Project have been published in the newspapers with national and local coverage.

8 Outline of the public opinion and main issues

The public opinion towards the Project has generally been supportive although some concerns and objections have also been disclosed. The state and local authorities have been of a supportive position regarding the Project.

It has been pointed out that one of the main positive aspects of the Project is additional direct and indirect employment that will be created in case of realisation of the Project. Besides, it

has also been found to be positive that such important foreign investment will be directed outside the region of Tallinn and Harju County, which are the most developed regions in Estonia.

In the course of the public procedures of the detailed planning (*detailplaneering*) of the plant, any material arguments against the Project were not presented. In such circumstances, the Kunda Town Council (*Kunda Linnavolikogu*) unanimously adopted the detailed plan together with the strategic EIA of the pulp plant on 28 June 2002.

Since production of the pulp inevitably cause some impact on the environment the local inhabitants and green organisations did have certain concerns related to the environmental impacts of the Project in the course of the EIA process of the Project.

The material environmental concerns pointed out of in the public consultation processes have been, as follows:

1. impact of wastewater of the Plant on the marine environment and nature protection areas;
2. protection of valuable aspen stands and illegal wood trading;
3. level of noise.

However, as a result of the procedures of the EIA and the integrated permit, several measures are intended to apply in order to mitigate the public concerns related to the Project. These measures include the following:

1. application of an environmental management system (ISO 14001) in the Plant;
2. periodical monitoring of impact of the emissions of the Plant, including the state of the marine environment pursuant to the conditions of the integrated permit;
3. prevention of the use of illegally obtained wood as a raw material for the Plant;
4. noise abatement measures.

Furthermore, the route of wastewater pipeline and wastewater outlet has been re-located as a result of the public discussions. The new locations of the outlet and pipeline will be more distant from the Letipea residence area and nature protection areas. In order to introduce the new location of the pipeline to the local people and to discuss the relevant issues, a public meeting took place on 10 April 2003 in Mahu village, Viru-Nigula. On 24 April 2003, the Viru-Nigula Municipality Council has partially established the comprehensive plan of the Letipea-Mahu coastal area which determines the location of the wastewater pipeline in the coastal area.

It should also be noted that from the early stages of the Project, the Estonian Fund for Nature (hereinafter "the ELF"), a well-known and respected non-governmental "green" organisation in Estonia, has declared that it supports the establishing of aspen pulp plant although it has set out some conditions for its support.

Based on the aforementioned conditions, on 3 February 2003, the ELF filed a complaint against the Lääne-Virumaa Environmental Service with the Jõhvi Administrative Court for revocation of the integrated permit of 3 January 2003 issued to AS Estonian Cell.

On 20 February 2003, the ELF, AS Estonian Cell and Lääne-Virumaa Environmental Service reached an out-of-court settlement pursuant to which the ELF waived its complaint and

AS Estonian Cell filed a request with the Environmental Service for certain amendments of the integrated permit required by the ELF. Such amendments specified the requirements of wastewater and marine ecosystem monitoring and set forth an obligation to apply measures in case of deterioration of the state of environment. Furthermore, the relevant amendments also included the following issues:

1. control of the origin of raw material; certification of 50% of products with FSC certificate;
2. application of the environmental management system (ISO 14001);
3. programme for reducing the impact of emissions.

As a result of the waiver of the complaint the Jõhvi Administrative Court terminated the court procedure. It may be concluded that by waiver of its complaint the ELF has clearly expressed its agreement with the amended version of the integrated permit. In the public meeting of 10 April 2003, the representative of the ELF also announced that the ELF has obtained its objective by the above-mentioned amendments to the integrated permit and supports the Project.

9 Information sources

1. Report on the assessment of the environmental impact of the aspen plant to be constructed at Kunda by AS Estonian Cell, OÜ Ecoman, Tallinn, July 2002
2. Specifications regarding the report on the assessment of the environmental impact of the aspen plant to be constructed by AS Estonian Cell at Kunda, OÜ Ecoman, Tallinn, September 2002
3. OÜ Ecoman letter of 11 September 2002 to the Estonian Ministry of the Environment on assessment of environmental impact of the aspen plant, OÜ Ecoman, Tallinn, September 2002
4. Ministry of Environment letter of 25 September 2002 on approval of the report on the assessment of the environmental impact of the aspen pulp plant, Estonian Ministry of the Environment, September 2002
5. Integrated Environmental Permit No. 1, dated 3 January 2003, Lääne-Virumaa Environmental Service, Rakvere, January 2003
6. Lääne-Virumaa Environmental Service Order No. 23, dated 25 April 2003, Lääne-Virumaa Environmental Service, Rakvere, April 2003.