Arctic Paper S.A.

Arctic Paper S.A. is one of the leading European manufacturers of bulky book paper and graphic fine paper. The Group produces high quality coated, uncoated woodfree and uncoated wood-containing papers. The Group’s product portfolio consists of the brands Amber, Arctic, G and Munken. Production takes place in Poland and Sweden.

The total annual production capacity of the Group’s three paper mills is abt. 695 000 metric tonnes. The Group currently employs about 1 200 people across Europe and we manage 14 sales organisations across Europe. Our head office is situated in Poznań (Poland) with a branch in Gothenburg (Sweden).

The Arctic Paper Group has been listed on the Warsaw Stock Exchange since October 2009 and since December 2012 on NASDAQ OMX in Stockholm.

Arctic Paper in Europe

Arctic Paper Munkedals AB is a part of the Arctic Paper Group, and in 2019 our turnover was slightly more than 1,6 billion SEK. Our largest markets are Germany, Sweden, the UK, France and Benelux, and sales are channelled through the Group’s own sales offices, agents and whole-salers, or direct to publishers and printers. Arctic Paper Munkedals AB has approximately 300 employees and is situated on the west coast of Sweden by the Örekil River – one of the country’s finest salmon waters. The Örekil River flows into the unique Fjord Gullmarn. Both the river and the fjord are areas of outstanding natural value. Paper manufacture started at Arctic Paper Munkedals AB in 1871, and we are now one of Europe’s leading manufacturers of uncoated graphic paper. Our paper is used mainly for printed advertising, periodicals and books. Because of our sensitive location, we were forced at an early stage to adapt our production to suit the natural environment. We manufactured our own pulp until 1965, when we stopped for environmental reasons.

Our aim is to be the better environmental alternative in a market where customers through their choice of supplier can contribute to a sustainable future.
We manufacture products that are ideally suited to a sustainable society, as our uncoated paper has a high content of FSC-certified renewable raw material. We are now whole-heartedly committed to staying one step ahead of public authorities’ demands and to continuously improving our environmental standard.

Environmental considerations have played an important role in investments in recent years, which has led to significant environmental improvements. Our water consumption and our discharges to water are now among the very lowest in the industry. In every step of the process, mainly in our own production but also through our purchases, considerations for the use of energy, raw materials and water are implemented.

Our vision within the next few years is to create a totally closed water system in our production process, which should fully eliminate discharges to water. With the aid of our environmental management systems, which is certified in accordance with the international ISO 14001 standard and registered according to EMAS, we have made our environmental work systematic and more efficient, in a way that guarantees continuous improvement in our environmental performance. Thanks to our employees’ commitment and local acceptance, we have managed to integrate environmental work into day-to-day operations in a natural way.

In our EMAS report we describe our operations, the environmental impact that we create, and how we are working to minimize this impact. In this report we follow up on environmental targets for 2019 and describe the environmental targets and action plans that have been adopted for 2020. In 2019, our focus has been on energy matters, but also, development of new sustainable products. Mainly packaging materials where printing properties together with strength properties plays a vital part of the products composition.

Our energy consumption have continuously increased. There are two main reasons to this trend, the first one is production disturbances we have faced during the beginning of the year. The second reason is related to the renewal of our product assortment in to more grades where higher strength properties are demanded. To reach this strength, the cellulose pulp needs to be grinded more thoroughly. This process leads to higher energy consumption.

During 2020 energy issues continue to stay in focus. Most clearly by the project start up to rebuild of our hydroelectric power plant. Located by the side of the mill. Fully developed in the year of 2021 this power plant double our hydro electric energy production. The old powerplant was closed early 2019. The new hydro electric power plant will double the amount of energy compared to the old one. In conjuction with the powerplant construcyion, we will also create better conditions for fish in the water source downstream og the mill by recreating the habitat that existed before the float epoch. This work is carried out in consultation with the environmental authorities.

If you have any comments or questions, you are welcome to get in touch with us.

Göran Lindqvist
Site manager Arctic Paper Munkedals AB
**Brands**
- Munken Book Papers: Munken Premium Cream, Munken Premium White, Munken Print Cream, Munken Print White, Amber Graphic by Arctic Paper Munkedal, Munken Highway Cream, Munken Highway White
- Munken Kraft Papers: Munken Kraft M1, M2

**Energy**
- Steam (oil, LNG): 42 MW, Capacity: 160 000 tonnes/year
- Steam (electricity): 35 MW, Sales Export 90%, Sweden 10%
- Own water turbines: 2 MW, Employees 300

**Paper machines**
- PM 5: Width 3.22 m, Grammage 60-240 g/m², Speed 750 m/min, Capacity 75 000 tonnes/year
- PM 8: Width 3.97 m, Grammage 60-150 g/m², Speed 800 m/min, Capacity 85 000 tonnes/year

**Sheet cutters**
- S1, S2, S3*, S11, S12: Width 35 - 168 cm, Length 42 - 188 cm, Capacity 80 tonnes/year
- *) laminating machine

**Storage capacity:**
- Munkedal: 4 500 ton
- Uddevalla (central storage): ca 5 000 ton (part of a company shared warehouse 20 000 m²)

**Certifications**
- Environmental management system ISO 14001:2015 - Qvalify cert no: 1005
- Environmental management system EMAS 1221/2009 - S-000248
- Chain of Custody FSC® - SGS-COC-001693
- Chain of Custody PEFC™ - SGS-PEFC/COC-0634
Awareness
In the modern history of mankind, the understanding of the interplay between people and the environment became marginalised at an early stage. Natural resources were regarded as being infinite and the human impact as negligible. The problems focused on were primarily those that tangibly and directly affected health. To make possible a systematic approach, methods for environmental review were developed, thus laying the foundation for additional environmental management.

In Fumifugium, John Evelyn published in 1661 “The Inconveniencie of the Aer and Smoak of London dissipated” which was the predecessor of the modern environmental review.

Concern
Environmental management can be defined as becoming aware in a structured way and gradually reducing one’s negative impact on the environment. EMAS and ISO 14001 are the specification documents that form the backbone of our environmental management systems. They are not only certificates of legal compliance, they also promote continuous improvement by means of routines, audits, objectives and programs.

Arctic Paper a pioneer
Today, there are many incentives behind the work on reducing the negative environmental impact and with its long-term commitment and well-established systems, Arctic Paper is a group with a clear focus on reducing environmental impact, increasing efficiency and an open dialogue.

Arctic Paper Munkedals AB’s business concept is to produce and market uncoated graphic paper of the very highest quality. At the same time we must be known for under-taking serious environmental work, and being able to offer our customers environmentally adapted products.

By means of continuous improvements to our operations, we shall minimise and prevent negative environmental impact from the products and services that we buy, manufacture and sell. We shall satisfy and preferably surpass prevailing environmental legislation, prevent accidents and fulfill other environmental demands made on us. This means that we must:

• Make environmental work an integrated part of the company’s long-term strategy by drawing up rules and regulations at group management level defining how environmental work is organised and implemented.
• Consult with, inform, educate and engage our employees in environmental issues.
• Produce, market and sell products with the least possible environmental impact.
• Make demands of and prioritize suppliers and contractors who promote raw materials, products, transport activities and services being manufactured and delivered in an environment-friendly way.
• Consider the environmental impact of new investments, new building or renovation, and other changes in the business.
• Openly communicate our environmental work and our environmental impact to the public, customers, suppliers, authorities and other interested parties.

Göran Lindqvist
Site Manager Arctic Paper Munkedals AB
**Pulp reception**
The mill does not manufacture its own pulp; instead, it purchases it in the form of bales from external suppliers. After arrival at the mill, the pulp bales are stored in the pulp warehouse until needed.

The pulp bales are slushed in process water, which has been purified internally, and then ground in refiners so that the fibres are softened and swell. Grinding is important for the paper’s strength properties. Various raw materials and chemicals such as filler chalk, adhesives and starch are added. The pulp is filtered in several steps to remove foreign particles.

**Paper machine**

**Headbox and wire section**
The function of the headbox is to distribute the diluted stock over the whole width of the wire. Dewatering and forming of the web take place in the wire section.

**Press section**
The web is dewatered still further in the press section. Here, the paper is given the right density and surface structure.

**Drying section**
The paper is dried in the drying section with the help of steam-heated cylinders.

**Surface Surface Sizing**
After drying, the surface on both sides of the paper is sized with a sizing/coating process. Surface sizing the paper gives it a smoother and stronger surface with improved printing properties. The surface is dried after the process with infra driers and a second drying section of steam-heated cylinders.

**Machine calendering and tambour**
The web passes through a calender, which gives it its final surface structure. The finished web is rolled onto a tambour and moved to the winding machine.

**Winding machine**
In the winding machine, the large reel is divided into smaller reels in line with the customer’s order. The different sizes of reels are combined so that the width of the web is optimally utilised.

**Finishing**

**Paper cutting machines**
The reels proceed for further conversion. In paper cutting machines, they are cut into sheets in varying formats as requested by the customer. Some of the sheets are packaged in an automatic bale packaging machine.

**Pallet pack**
The sheet pallets are provided with a cardboard lid made of recycled paper and shrink-wrapped.

**Reel pack**
Reels to be delivered directly to the customer are fitted with protective packaging and labelled so that they can be identified.

**Storage and shipping**
The finished reels and pallets of sheets are placed in the mill’s warehouse for finished goods until they are released from inventory for transportation to corporate warehouse or the customer by road, rail or sea depending on the customer’s geographical location.
**Purification plant**

The process wastewater is channelled to our final purification process. The water is purified through a combination of biological and chemical treatment.

a) The first stage is the buffer tower. This is where the decomposition of pollutants commences. Here we add nitrogen and phosphorus to provide nutrients for the bacteria in the water. Air is blown into the base of the tower, to oxygenate the water.

b) The next stage is a bio-bed, which is filled with solid plastic material and has a very large surface area – roughly equivalent to 10 football pitches (60,000 m²). Here a biofilm of bacteria and larger creatures is formed, which continues to break down pollutants in the water.

c) The water proceeds to towers with floating material, the surface of which is covered by bio-film. Air is added to make the material circulate in the towers.

d) The air also serves to ensure that the bacteria and the larger creatures have good access to oxygen, which is necessary for their survival and consequently for the biological decomposition of the surplus water.

e) The treated water proceeds to the ultra-filtration plant.

f) The final, treated water from ultra-filtration goes to our external ponds, before being discharged into the Munkedal River or recirculated to the mill.
The raw materials, chemicals and the energy needed to manufacture 1 tonne of paper in 2019 (2018) are specified below. The emissions to air and water and the amount of waste this gives rise to are also reported. Finally, we report on how we complied with the regulations laid down by the authorities. Applicable environmental requirements are specified in the environmental report to the authorities and can be ordered from EMAS contact person.

### Energy

<table>
<thead>
<tr>
<th>Energy extraction</th>
<th>Max permit</th>
<th>Result 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustible</td>
<td>1,27 (0,95) kg</td>
<td>65 kg/day</td>
</tr>
<tr>
<td>Wood</td>
<td>0,16 (0,13) kg</td>
<td>244 kg/day</td>
</tr>
<tr>
<td>Hazardous</td>
<td>0,42 (0,36) kg</td>
<td>53 kg/day</td>
</tr>
<tr>
<td>Electricity – purchased</td>
<td>691 (615) kWh</td>
<td>13,7 kg/day</td>
</tr>
<tr>
<td>Electricity – produced</td>
<td>63 (65) kWh</td>
<td>0,8 kg/day</td>
</tr>
<tr>
<td>Oil</td>
<td>0 (11) kWh</td>
<td>200 000</td>
</tr>
<tr>
<td>LNG</td>
<td>1 569 (1 616) kWh</td>
<td>200 000</td>
</tr>
<tr>
<td>Diesel</td>
<td>0 (0) kWh</td>
<td>200 000</td>
</tr>
<tr>
<td>LPG</td>
<td>0 (0) kWh</td>
<td>200 000</td>
</tr>
<tr>
<td>Totally used energy</td>
<td>2 260 (2 242) kWh</td>
<td>200 000</td>
</tr>
</tbody>
</table>

### Discharges to water

<table>
<thead>
<tr>
<th>Discharges to water</th>
<th>BAT *</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOX</td>
<td>2,16 (2,64) g</td>
</tr>
<tr>
<td>SS (Suspended solids)</td>
<td>0,132 (0,129) kg</td>
</tr>
<tr>
<td>CODCr (Chemical oxygen demand)</td>
<td>0,499 (0,484) kg</td>
</tr>
<tr>
<td>BOD7 (Biological oxygen demand)</td>
<td>0,119 (0,117) kg</td>
</tr>
<tr>
<td>Nitrogen (N)</td>
<td>0,0281 (0,0317) kg</td>
</tr>
<tr>
<td>Phosphorus (P)</td>
<td>0,0017 (0,0017) kg</td>
</tr>
<tr>
<td>Process water to recipient</td>
<td>4 273 (3 491) kg</td>
</tr>
</tbody>
</table>

### Discharges to air

<table>
<thead>
<tr>
<th>Discharges to air</th>
<th>**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur (SO2)</td>
<td>0.00 (0.00) kg</td>
</tr>
<tr>
<td>Nitrogen oxide (NOx)</td>
<td>0.182 (0.185) kg</td>
</tr>
<tr>
<td>Carbondioxide (CO2)</td>
<td>322 (336) kg</td>
</tr>
</tbody>
</table>

### Material recycling

<table>
<thead>
<tr>
<th>Material recycling</th>
<th>BAT *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosediment</td>
<td>20,0 (20,0) kg</td>
</tr>
<tr>
<td>Metal</td>
<td>2,22 (2,16) kg</td>
</tr>
<tr>
<td>Paper/board</td>
<td>12,12 (8,45) kg</td>
</tr>
<tr>
<td>Plastic</td>
<td>0,07 (0,6) kg</td>
</tr>
<tr>
<td>Hazardous</td>
<td>0,05 (0,81) kg</td>
</tr>
</tbody>
</table>

### Compliance with permit conditions

<table>
<thead>
<tr>
<th>Compliance with permit conditions</th>
<th>Max permit</th>
<th>Result 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production level net</td>
<td>200 000</td>
<td>147 569 tonnes/year</td>
</tr>
</tbody>
</table>

### Other

<table>
<thead>
<tr>
<th>Other</th>
<th>**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise (night time)</td>
<td>45 dB(A)</td>
</tr>
<tr>
<td>Freshwater from river</td>
<td>4,5 l/minute</td>
</tr>
</tbody>
</table>

*BAT - Best available technique / EU-BREF 2015 (Unintegrated finepaper) Refers to production net slitter machine.

** no emissions over the permit reporting limit
GULLMARN

One of Sweden’s most studied fjords

The water in Sweden’s largest genuine sill fjord is divided into several layers from Baltic sea, Kattegatt, Skagerrak, Northern sea and the Atlantic. The depth is home for Twohorn sculpin, Atlantic hookear sculpin and Northern stone crab.

The fjord Gullmarn is Sweden’s largest fjord. The length is almost 30 km, the width 1–4 kilometer with depths down to 125 meter. Passing the island Bornö the hill Smörkullen rises 134 meter over the sea level. A sill fjord means that it is long, deep and narrow and has a sill at the mouth.

Gullmarn was formed by a fault hollowed out by watercourses and inland ice 560 million year ago. It is the natural border between the 920 million year old red granite in the north and the 1700 million year old area of gnejs in the south.

In 1830 scientists and interested parties were gathered on Kristineberg to discuss and to study the biodiversity of Gullmarn. One of these were the artist Wilhelm von Wright who painted – Fishes in Scandinavia, the zoologist Sven Lovén who is claimed to be the first to ever study the biodiversity of Gullmarn and the ornithologist and conservator Gustaf Kolthoff who published the book - Nordic Birds.

Three large ocean streams affects the marine life of Gullmarn. This means that we find water from Baltic sea, Kattegatt/Skagerrak och Northern/Atlantic sea. Due to differences in salinity (content of salt) these water finds their own depths. This stratification of salinity complicates the water exchange.

With a sill at 40 meters in the mouth of the fjord it causes a unique biology and at the same time a greater vulnerability to pollutants. The deepest area in Gullmarn has a biology that is like that on 300-600 meters depth in the ocean outside the fjord.

In the depths it is almost complete darkness, cold (4-5 degrees celsius) with high salinity (35 per mille). Here we find creatures like the Twohorn sculpin, Atlantic hookear sculpin and Northern stone crab.

Gathering aspects

We have identified the most significant environmental aspects in our business. The environmental assessment is based on a holistic approach, where the entire chain from the production of materials used in our products to the shipment of our products is taken into consideration. The significant environmental aspects can then be a focus of environmental work and form the basis of improvement plans.

The significant environmental aspects are produced by drawing up a list of the various activities in the company together with a description of their environmental aspects and environmental impact. The aspects are reassessed as the business develops and the findings of new research become available.

Selecting aspects

Our environmental assessment considers the following issues:

• Does the aspect cause a known, significant environmental impact, such as environmental threats identified by the Swedish Environmental Protection Agency, or does it counteract the national environmental targets adopted by the Swedish parliament?
• Does it involve high consumption of scarce raw materials, natural assets or energy?
• Does the environmental aspect involve a chemical that is harmful to the environment?
• Could the environmental aspect cause a serious environmental accident?
• Is the size/volume/content of the environmental aspect significant in terms of the environmental impact?

Using this approach, the following significant environmental aspects have been identified:

- Emissions to air
- Transport Operations
- Chemical products
- Energy
environmental impact

Coolants
At Munkedals we have used two kinds of coolants: HCFCs (hydrochlorofluorocarbons), which break down the protective ozone layer and contribute to the greenhouse effect, and HFCs (halogenated hydrofluorocarbons), which do not affect the ozone layer but do have quite a large impact on the greenhouse effect. For many years the cooling and climate units have been converted to phase out HCFCs and replace them with more environmentally friendly coolants. From this year we have changed the reported value from HFC to CO₂E that now is the common report criteria.

The diagram on the left shows the amount of installed Coolants converted to CO₂ Equivalents.

Transport operations
Transport operations cause noise, emissions to air and the consumption of fossil fuels. The environmental impact of transport operations is therefore one of the considerations when we decide which transport companies to use.

Truck engines are divided into various EURO classes, in which a higher figure represents engines with lower emissions, especially of nitrogen oxides and carbon monoxide. Transport operations is based on transported tonnes.
core indicators

Annual progress
During 2019 the production decreased from 150 000 ton to 147 000 ton. Water use increased to 4.56 liter per kilo produced paper. The reason to the water increase is the Hydro electric rebuild project. The water recirculation has been temporarily reduced due to this project.

The total energy consumption was on the same level as 2018 per ton of produced paper.

Discharges to water and air are among the lowest in the industry today, well under the BAT (Best available technique) values.

Net production
The relation to net production of paper is an important aspect when describing the progress of the company’s environmental performance.

The net production shown in the trend diagram is used to calculate the efficiency of the operational activity with respect to the core indicators.

Material efficiency
The main raw materials used in paper production are pulp, pigment, starch and auxiliary chemicals. Raw materials are transported to the mill by sea, road and rail.

For key figures for Raw materials, see p. 8.

The investment in a Natural gas plant have secured the energy supply and decreased the Sulphur dioxide emissions to air.

During the year the rebuild of our hydro electric power station has started. After this rebuild project, site produced electricity will be doubled.

Permits where applied during the year for an on site built solid fuel boiler.

During 2019, emissions to water have shown very small variations compared to previous year.
**Energy efficiency**

The most energy-intensive processes in the production of paper are the production of steam and the operation of the paper machine’s engines, grinders and pumps.

The steam is distributed to sealed cylinders where the paper is dried.

The diagram shows the total energy consumption and the distribution between different types of energy sources. For key figures for Energy consumption, see p. 8.

**Water use**

When manufacturing paper, water is used to slush the pulp into fibre stock and to transport the fibres to the paper machine’s headbox. In the paper machine, the stock is dewatered when the paper is formed. Most of the water is utilised and recirculated in the mill. Water that is not recirculated goes to the mill’s water purification plant.

The amount of water used is measured as the water leaving the mill after having passed through the water purification plant.

This year the amount used water have increased due to the rebuild of our hydroelectric power plant. The water recycle have not been in use during this project. After the project is finished, the figures will be back to the previous levels.

**Waste**

The diagram shows the company’s amount of waste in relation to production. Whenever possible, the waste is recycled. Waste that is not suitable for recycling is used for energy recovery or landfill/sent to a treatment plant for destruction.

Total waste increased by 124% during the year. The reason to this is the big amounts of soil that have been moved to landfill during the hydroelectric power plant project. For key figures for Waste, see p. 8.
core indicators

emissions to air

Sulphur dioxide (SO₂)
Sulphur dioxide is formed during the burning of fuel containing sulphur, e.g. oil and coal. Sulphur dioxide contributes to the acidification of land and water. During 2019 we decreased the use of LNG slightly. This is why emissions to air are generally low. LNG contains no sulphur.

Nitric oxides (NOₓ)
An umbrella term for the nitric oxides formed during combustion and which can contribute to the acidification of land and water. During 2019 the use of LNG (Liquefied Natural Gas) showed a small decrease. Purchased electricity increased. Though the changes compared to last year was small.

Carbon dioxide (CO₂) fossil
Carbon dioxide is formed during the complete combustion of carbon compounds in oxygen. When fossil fuels are burnt, the carbon dioxide content in the atmosphere increases because the carbon thus added to the atmosphere has been outside the natural cycle for a very long time.

The increased carbon dioxide content in the atmosphere is considered to be one cause of global warming. During 2019 the use of LNG (Liquefied Natural Gas) decreased. The decrease was small.

Purchased electricity increased by a small part.
emissions to water

Phosphorus (P)
Phosphorus is an element. High levels of phosphorus compounds can, together with nitrogen compounds and organic substances, result in heightened organic activity in water, which, in turn, can result in watercourses becoming overgrown.

Nitrogen (N)
An element that exists in large amounts in the atmosphere, High levels of nitrogen compounds can, together with phosphorus compounds and organic substances, result in heightened organic activity in water, which, in turn, can result in watercourses becoming overgrown.

Suspended Solids (SS)
Fiber fragments and other solid substances (e.g. chalk) in waste water are called suspended solids and cause oxygen consumption and shallowing where the discharge takes place.

COD\text{Cr}
Chemical Oxygen Demand – a measurement of the amount of organic compounds in water. It is mainly the organic content that consumes oxygen during decomposition.

BOD\text{7}
Biological Oxygen Demand – a measurement of the amount of oxygen consumed by microorganisms during the decomposition of organic substances in water over a period of seven days.
# Environmental Targets 2019

<table>
<thead>
<tr>
<th>Overall Environmental Targets</th>
<th>Detailed Environmental Targets</th>
<th>Programme</th>
<th>Target/Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce risks for environmental accidents.</td>
<td>Further improve the collection hollow.</td>
<td>Decision taken to increase buffering capacity. An already existing tank to be used for this purpose.</td>
<td>An already existing oil tank is under reconstruction to become the new buffer tank waste pulp mix. New pipes to be constructed.</td>
</tr>
<tr>
<td>2. Reduce the risk of environmental accidents.</td>
<td>Improving the safety of chemical products.</td>
<td>Ongoing risk analysis at chemical unloading areas and internal transports.</td>
<td>Loading bays have been risk assessed as well as the handling of petroleum products. This project planned to be finished beginning 2020</td>
</tr>
<tr>
<td>3. Reduced emissions to water.</td>
<td>Automated water filtration.</td>
<td>Installation of new equipment for filtration of incoming water to powerplant and papermachines.</td>
<td>Project process after hydro power project. Powerplant project finished. The technical solution is under consideration.</td>
</tr>
<tr>
<td>4. Biodiversity.</td>
<td>Improve living conditions for migrating fish in the Munkedal river.</td>
<td>Investigate the opportunities for habitat improvements in the Munkedal river.</td>
<td>Handled within the coming hydroelectric project. Consultant hired. To be finished May 2020</td>
</tr>
<tr>
<td>5. Reduce the use of freshwater.</td>
<td>Increase the proportion of returned process water</td>
<td>Step by step increase the amount of process water from the outer pond to the raw water purge until the target is achieved.</td>
<td>New filters ordered and delivered. Installation beginning 2020. Goal of 20% reused water established.</td>
</tr>
</tbody>
</table>

In 2016, installation of heat recovery was carried out on PM8.
## Overall Environmental targets

<table>
<thead>
<tr>
<th>Detailed Environmental targets</th>
<th>Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve the collection hollow.</td>
<td>Decision taken to increase buffering capacity. An already existing tank shall be used for this purpose. New lining for tank inside covering ordered.</td>
</tr>
<tr>
<td>Improving the safety of chemical products.</td>
<td>Ongoing risk analysis at chemical unloading areas and internal transports. Project planned to be finished quarter 1 2020.</td>
</tr>
<tr>
<td>Automated water filtration.</td>
<td>Installation of new equipment for filtration of incoming water.</td>
</tr>
<tr>
<td>Increased amount of Hydro energy.</td>
<td>Installation of a new hydro power station. An agreement signed to build a solid fuel boiler. Permissions for the boiler under management.</td>
</tr>
<tr>
<td>Improve living conditions for migrating fish in the Munkedal river.</td>
<td>Investigate the opportunities for habitat improvements in the Munkedal river. Planned to be done July-Sept 2020</td>
</tr>
<tr>
<td>Increase the proportion of recycled processwater from the outer pond to the incoming water source from 10% to 25%.</td>
<td>Step by step increase the amount of process water from the outer pond to the raw water purge until the target is achieved. Recycle process not in use spring 2020 due to hydro electric powerplant project.</td>
</tr>
</tbody>
</table>

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Coastline of the Gullmarn fjord, a couple of kilometres downstream from the mill in Munkedal
RISE is a SWEDAC accredited environmental verifier which has reviewed Arctic Paper Munkedal AB and found that the company has an EMS that meets the requirements of the EMAS regulation (no 1221/2009). RISE Certification also examined this report and found it to be accurate and sufficiently detailed to satisfy the requirements of EMAS.

Munkedal, 2020-05-28

Anders Eriksson / RISE Certifiering

How to order environmental reports

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arcticpaper.com

Arctic Paper Munkedals environmental report is available in swedish and in english, on the web and in printed matter.

Next environmental report is available in spring 2021.

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glossary

ACCREDITED COMPANY
A company that has been approved by a supervisory authority for example to conduct special analyses and checks on industrial processes.

BIOLOGICAL TREATMENT
Decomposition of pollutants in water with the aid of microorganisms.

BLEACHING
A method of increasing for example the pulp’s brightness. Bleaching is undertaken using chemical compounds without elementally bound chlorine, ECF, or without any chlorine compounds, TCF.

BOD₇
Biological Oxygen Demand. The amount of oxygen required for natural decomposition of wastewater. 7 means that the natural decomposition has been going on for seven days, for the analysis. BOD is low in relation to COD if remaining substances are hard to decompose and the biological treatment is functioning well. High values involve an increased risk of a lack of oxygen in the container.

CARBON DIOXIDE, CO₂
A naturally occurring gas that is formed by biological decomposition and combustion of organic materials.

CHEMICAL PRECIPITATION
Chemical bonding of pollutants which makes it possible to separate the pollutants from the waste water through sedimentation.

CHEMICAL PULP
A joint term for SULPHATE PULP and SULPHITE PULP, which are manufactured by chemically detaching the wood’s fibres from one another.

CODₐ
Chemical Oxygen Demand. The amount of oxygen required for chemical decomposition of remaining pollutants in for example wastewater. Cr means that chromate has been used as oxidation agent for the analysis. High values may involve an increased risk of a lack of oxygen in the recipient.

dB(A)
Decibel A, a measure of the amount of sound measured with a filter that takes account of the human ear’s sensitivity to various sound frequencies.

EMAS
Eco-Management and Audit Scheme. A voluntary EU decree and requirement document for an environmental management system. EMAS requires, in addition to the fact that ISO 14001 or equivalent is fulfilled, that an official environmental report is compiled. The environmental report is examined and approved by an accredited environmental audit company.

EUTROPHICATION
PHOSPHORUS, P, and NITROGEN, N, are elements included in nutrient salts that increase the growth of plankton in water. If the content of the nutrient salts is too high, such growth can be so strong that the oxygen is used up and a shortage of oxygen arises.

FINE PAPER
A generic term for graphic paper, writing paper and printing paper, and certain special types of paper.

FSC® CERTIFIED RAW MATERIAL
Raw material with guaranteed origin (Forest Stewardship Council) which exclude wood produced in conflict with FSC’s 5 paragraphs (illegal lumbering, key biotopes, serious social conflicts, genetically modified wood or nonsustainable forestry).

GUIDELINE VALUE
A guideline value is a value that, if exceeded, places an obligation on the permit holder to take action to ensure that the value can be met.

HAZARDOUS WASTE
Waste containing pollutants that are directly hazardous to the environment, such as certain chemicals, waste oils, batteries, fluorescent tubes, mercury lamps and electronic scrap.

ISO 14001
An international standard containing specific requirements for an environmental management system. A certificate remains valid for three years on the condition that there is compliance with the certification requirements and the annual audits are conducted and produce a successful result.

LIMIT
A value for discharges from industrial operations that has been set by the environmental authorities and that may not be exceeded.

MECHANICAL PULP
A joint term for pulp which is manufactured by mechanically detaching the wood’s fibres from one another.

NITROGEN OXIDES, NOₓ
Gas formed when the nitrogen in combustion air is oxidised at a high combustion temperature. Contributes to acidification and eutrophication.

OXYGEN-CONSUMING SUBSTANCES
Substances that consume oxygen when broken down. Measured as COD and BOD.

RECIPIENT
A receiving entity for discharges, such as the sea, a lake, a watercourse or the atmosphere.

SULPHUR DIOXIDE, SO₂
Formed by the combustion of sulphurous fuels such as gas, coal, oil and oil products. Discharges contribute to the acidification of land and lakes.

SUSPENDED SOLIDS, SS
The volume of solid matter in water that remains in a filter with a mesh of a defined size.

UNCOATED PAPER
Paper which has been coated with a thin layer of starch, in contrast to COATED PAPER which is coated with a layer consisting of elements including among others clay, chalk, starch and synthetic binding agents.