

Environmental Report Water Solutions 2018



We have a mission

At RGS Nordic we work to give our children a world in which the Earth's resources are cleaned and reused. We cooperate closely with our customers to make the circular economy a profitable activity. Read more at rgsnordic.com



RGSNORDIC



Table of contents

Quality, environmental and health & safety policy for RGS Nordic – industrial wastewater	4
Environmental Report 2018	4
Management’s signature	4
Presentation of the company	6
Description of RGS Nordic – Industrial wastewater’s activities	8
Environmental considerations	11
Environmental impacts	11
Energy efficiency and energy consumption	12
Environmental issues	24
Environmental accidents	25
Management system	26
System design	26
Environmental targets and objectives for 2018	28
Health & safety targets and objectives for 2018	28
Environmental targets and objectives for 2019	29
Quality targets and objectives for 2019	29
Health & safety targets and objectives for 2019	29
Development of the environmental management system	30
DNV GL – Business assurance Denmark A/S certificate	31

Quality, environmental and health & safety policy for RGS Nordic – industrial wastewater

RGS NORDIC – Industrial Wastewater wants to:

- be the leading company in value-creating industrial wastewater management.
- offer treatment solutions for industrial wastewater and sludge that, through a holistic approach, creates value for the company's customers and results in a high level of safety, minimises resource consumption and minimises environmental impact.

RGS NORDIC – Industrial Wastewater will:

- establish objectives and set targets to ensure that the quality, health & safety, and environmental policy can be complied with.
- ensure a professional, value-creating and service-minded approach to all stakeholders.
- monitor market developments and ensure commercial drivers in relation to, among other things, technologies, sustainability and CSR.
- be proactive and recognised for our high quality and professionalism.
- ensure qualified sparring with all our stakeholders (customers, staff, authorities, NGOs, shareholders and others).
- optimise resource consumption by focusing on work processes, routines and available technologies.
- create a health & safety culture at the company which guarantees the involvement of staff and creates peace of mind in everyday life: this also applies to persons at our plant for shorter or longer periods of time.
- continue to focus on and improve health & safety to minimise accidents.

- offer stimulating working conditions where staff members are equipped, through information and training, to assume the role of pioneer.
- maintain an open dialogue with our shareholders, customers, staff, public authorities and other stakeholders, and publish objectives and targets in the company's environmental report.
- in addition to complying with the law, have a commitment to reduce the impact on our surroundings through prevention and continuous improvement.
- maintain and improve our management system so it continues to effectively support the company's business areas and comply with regulatory requirements, as well as with our own requirements for our products and services.
- comply with binding obligations from relevant stakeholders.

Environmental Report 2018

This environmental report concerns RGS NORDIC – Industrial Wastewater, which is still located at Stignæs Industripark, Askelunden 24, DK-4230 Skælskør.

This environmental report covers the period from 1 January 2018 to 31 December 2018.

The environmental report has been verified by DNV GL – Business Assurance Denmark A/S on 2 May 2019, pursuant to the EMAS Regulation. The verifier's accreditation number is DK-V-6001.

The next environmental report will be published in mid-2020.

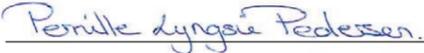
The aim of this environmental report is to provide investors, regulators, customers, neighbours and other partners with easily accessible information about the company's environmental considerations, policies and objectives.

Verification does not cover health & safety.

Management signature

Stignæs, 2 May 2019


Jonathan Cope
Business Unit Director, Water Solutions


Pernille Lyngsø Pedersen
Production Manager, Water Solutions



Presentation of the company

Company name and location

RGS NORDIC Industrial Wastewater
Askelunden 24
DK-4230 Skælskør

The wastewater treatment plant at Stignæs Industripark was established in 1988. The plant is currently owned by RGS NORDIC. The area is covered by District Plan No. 126 of 9 October 2003 from Skælskør Municipality for an area for waste processing companies at Stignæs Industripark. The District Plan is applicable to this business area.

Industry, main activity and list items

The main activity is the collection and treatment of wastewater, and the company is covered by the Ministry of Environment's Statutory Order No. 1317 of 20 November 2018 on the approval of listed activities, Annex 1 list item 5.1 "Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes/day, and where one or more of the following activities is involved":

- a) Biological treatment.
- b) Physico-chemical treatment.
- j) Re-refining or other forms of reusing oil.

As well as list item 5.3 b) "Recovery, or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes/day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC on urban wastewater treatment":

- i) Biological treatment.
- ii) Physico-chemical treatment.

NACE code 37.00

The wastewater treatment plant was built with the purpose of treating wastewater from companies in Stignæs Industripark, as well as from external suppliers. The construction of Stignæs Industripark has been completed, and companies who establish themselves here are connected to the central common facilities at RGS NORDIC – Industrial Wastewater: a biological-chemical treatment plant with various pretreatment facilities, the supply of process and drinking water, etc.

There are 14 employees within the specific business area of wastewater treatment.

Biodegradable, concentrated industrial wastewater with a high content of organic matter, nitrogen, salts and heavy metals is treated at the biological-chemical treatment plant. Wastewater and waste from companies in the Stignæs industrial area, as well as from other companies at home and abroad, is treated.

RGS NORDIC has/can obtain approval for treating the following industrial residues:

1. Biodegradable "problem wastewater" with, for example, a high content of organic matter that must not be directed to the sewer due to its concentration, health risks or its odour.
2. Wastewater which requires the acclimation of the activated sludge, and which has to be fed in a controlled flow, for example due to high nitrification of sludge which has not been acclimated.
3. Wastewater containing substances that are adsorbed to sludge.
4. Heavy-metal-containing wastewater.



5. Other types of waste or sludge of which proper degradation and/or recycling can be demonstrated.
6. For recovery, readily biodegradable carbon-containing wastewater, used lye for pH control and non-salt-containing wastewater are received among other things.
7. Oily wastewater, in which the oil is separated and recycled, is also received for recovery.

Environment supervisory authority and environmental approvals

Slagelse Municipality is the supervisory authority for the company.

On 9 March 1989, West Zealand County granted a discharge permit and company approval for the wastewater treatment plant pursuant to the Environmental Protection Act, Chapters 4 and 5. The company was approved as a treatment plant for chemical waste and wastewater.

The discharge permit is a framework approval, and conditions change in line with the expansion of Stignæs Industripark. So far, the following significant changes have been made:

1. Supplement to the discharge permit of 9 October 1990.
2. Annex no. 2 of 26 November 1991 in connection with the commissioning of the treatment plant.
3. Annex no. 3 of 23 November 1992 on softening plants.
4. Amendment to conditions of 11 December 1995 in connection with the introduction of a new type of wastewater.

5. Amendment to conditions of 11 June 1997. Audit of impartial control.
6. Renewed environmental permits, adopted on 26 November 2008, which entered into force on 12 July 2013 after a ruling was made in two appeal cases for the new permit.
7. Supplementary approval of 25 February 2011 and 8 November 2013 for environmental approval of 26 November 2008 concerning additional storage tanks.
8. Supplementary approval of 25 September 2015 for the expansion of the plant with an additional process line
9. Supplementary approval of 13 June 2017 for four holding tanks and a blower
10. Supplementary approval of 1 May 2018 amending the list designation

RGS NORDIC notifies Slagelse Municipality when connecting new industries or concluding contracts with external industries for treating chemical waste or wastewater, which is transported to them in tanker vessels or road tankers.

Acceptance testing is done on all wastewater and waste in the form of chemical analyses, ensuring that only approved products are received at the plant.

Description of RGS Nordic – Industrial wastewater’s activities

RGS NORDIC – Industrial Wastewater’s activities are described below with an emphasis on essential resource and environmental parameters.

The following process flow diagram explains the wastewater treatment plant’s production, which consists of treating industrial wastewater and waste. Sludge is produced for recycling, as well as treated wastewater which is discharged into Agersø Sound. Electricity, natural gas, chemicals and water are used in the treatment process, just as carbon and bases in the wastewater are recovered as auxiliary substances.

Furthermore, spare parts, oil and lubricating grease are used in the maintenance of the plant’s mechanical parts.

Inlet

The wastewater is fed into the pipeline from the Stignæs industrial area. Wastewater from external industries is transported in road tankers or is received by ship at Gulf Havn at Stignæs, and is then pumped by pipeline to the treatment plant. Proportionally, fewest resources are used on direct admission through pipeline or transport by ship.

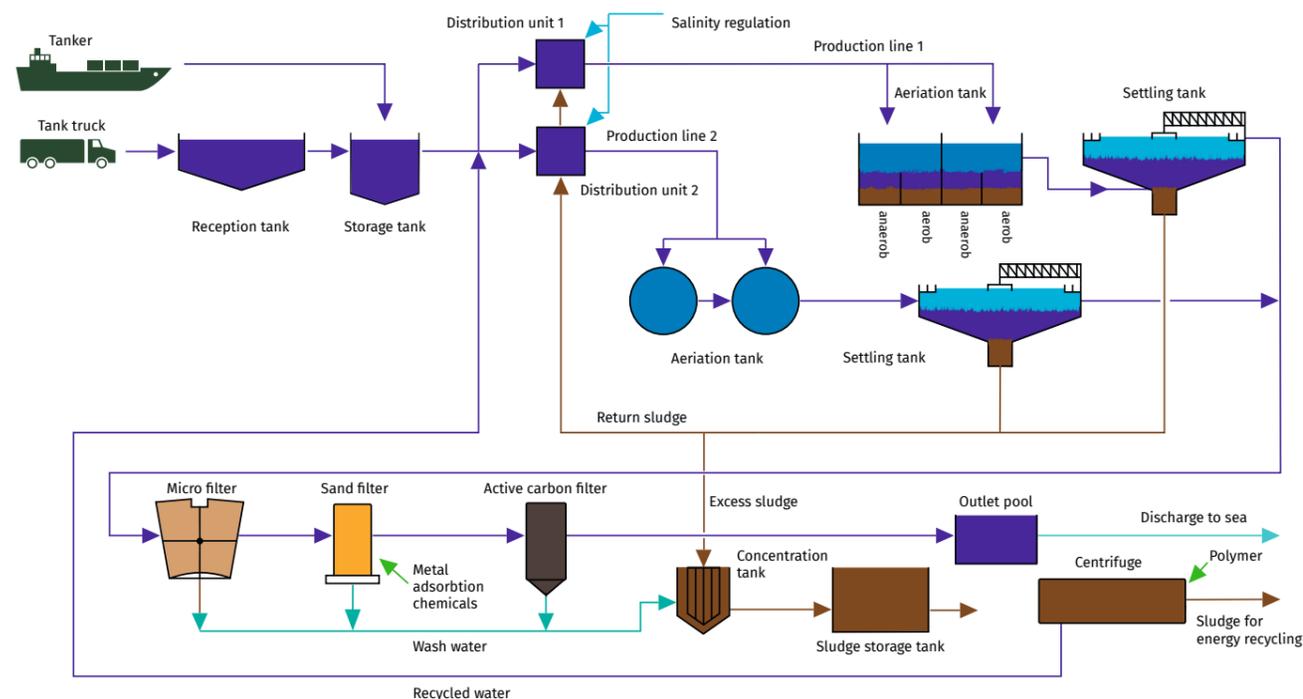


Figure 1. Process flow diagram

Receiving and storage facilities

RGS NORDIC – Industrial Wastewater has a total of approx. 100,000 m³ of receiving and storage facilities. Electricity is used for pumps and agitators in the tanks. Odour reduction measures are established at these facilities, as well as a tank for storing an oily residue from imported wastewater.

Heavy metal precipitation plant

Certain types of wastewater must be pretreated in a heavy metal precipitation plant. Precipitation chemicals and a polymer are added at the plant to remove the heavy metals by precipitation, thereby generating sludge for reuse. This plant treats wastewater from nearby industries and is fed by pipeline.

Separation of the oil phase

Wastewater with substantial amounts of oil phase is collected in storage tanks where the oil is separated from the water by means of a skimmer pump and is pumped to an oil storage tank. The oil is then sent to an external partner for recycling.

Use of rainwater and drainage water

All rainwater from Stignæs Industripark’s paved areas and buildings, as well as drainage water, is collected. It is treated and used as process water at the treatment plant, as a dilution of saltcontaining wastewater. During heavy rain, unpolluted rainwater is discharged directly into Agersø Sound.

Biological-chemical treatment

Wastewater is pumped from the receiving and storage tanks to a selector, and from there it flows on to the activated sludge system, in which the organic matter, nitrogen and phosphorous is removed under alternating anaerobic (oxygen-free) and aerobic (oxygen-rich) conditions. Electricity is used for agitation and aeration, and water is used for adjusting the amount of salt and auxiliary substances for pH control, phosphorus precipitation and improvement of the sludge’s precipitation properties.

Secondary clarifiers

After biological treatment the wastewater is fed to the secondary clarifier, where the sludge is precipitated. Some of the sludge is pumped back to the process, and the excess sludge is pumped via the sludge concentration and sludge storage tanks for dewatering.

Microfilters

From the secondary clarifier, the water is fed to two microfilters with a 10 µm cloth. This step is to hold back even small particles, so that they do not continue to the carbon filters.

Sand filters

The treated wastewater is directed from the microfilter to repolishing in the form of three sand filters which, by the addition of auxiliary substances, remove fine particles before the water is passed to a buffer tank (tank 2)

Carbon filters

Finally, the treated wastewater is fed to a second polishing step in the form of carbon filters. Here, COD which has not degraded in the biological system is removed and then discharged into Agersø Sound at a depth of 9 metres through a pipeline. The treated wastewater contains small degraded residues of the incoming wastewater, as well as chemical and bacterial residues.

Sludge for recovery

The excess sludge is pumped from the sludge concentration tanks and sludge storage tanks to a centrifuge for dewatering. Polymer is added to dewater the sludge. The water is returned for biological treatment.

The dewatered sludge consists of organic matter, nitrogen, phosphorus and various salts from the wastewater. It also contains metals and potential environmental pollutants which are adsorbed to the sludge from the wastewater and bacteria residues.

The biological sludge is recovered in incineration plants to produce electricity or heat.

RGS NORDIC – Industrial Wastewater can also receive sludge for recycling from external suppliers. Wet sludge can be dewatered in RGS NORDIC – Industrial Wastewater’s centrifuge for further recovery purposes.

Product optimisation

In 2019, we will focus on the acclimation of the biomass to higher salt concentrations.

Projects in 2019:

The project from 2018 regarding reception facilities for slop and wash water with oil residues (including Class 1 oil) will continue in 2019. We expect to have reception facilities ready by the end of 2019.

In 2019, we also expect to obtain permission for and commission a plant for energy recovery from sludge. The excess energy from the incineration process will primarily be for drying and otherwise for heating process water.



Environmental considerations

Wastewater treatment plants are based on the receipt and treatment of industrial wastewater and sludge. This way, treated wastewater is produced for discharging to the recipient, as well as biological sludge, which is recovered.

In 2015, the company updated the survey of all direct and indirect environmental considerations which concern our activities in terms of normal operation, startup and shut-

down, as well as unforeseen situations. The survey was performed in accordance with the criteria of Regulation EMAS III of 28 August 2017. Greenhouse gas emissions are calculated based on total energy consumption.

As part of the company's environmental management system, annual targets are set for the plant's environmental improvements.

Environmental impacts

Data sources for significant environmental impacts

The significant, direct environmental impacts are determined based on identifying the wastewater treatment plant's environmental considerations. Measured and recorded data is collected from the control system resulting from the treatment plant's daily operations control, the last environmental report and from monthly reports submitted to Slagelse Municipality.

We have previously chosen to show the figures from the previous four financial years, which provides an excellent opportunity for assessing developments in the operation of the treatment plant.

In accordance with EMAS III of 28 August 2017, we have also decided to set out the company's direct environmental performance against relevant key indicators. The figures are presented in Table 3.

The measuring methods for the numerical values used are as follows:

The amount of *incoming and outgoing substances* is based on exact measurements and weighings of the total amounts, compared to analyses of substance values. All instruments and scales are calibrated and there is only a few percent's worth of inaccuracy in the analyses.

For *incoming substances*, only the amount of collected rainwater is calculated, while auxiliary substances are calculated

via manual measurement and compared to the monthly inventory and supplier information.

In *outgoing substances*, treated wastewater, there are only small amounts of phenol, sulphide and mineral oil based on random sampling. All other substances which there are value requirements for are based on a flow-proportional overall control compared to analyses according to applicable Danish standards.

The amount of excess sludge is based on weight measurements calibrated by weight compared to a daily random sample analysis of the dry matter.

Wastewater

The plant's raw materials consist of approximately 30 different types of industrial wastewater entering the treatment plant. Before introducing a new type of wastewater, various analyses are carried out such as chemical analysis, biodegradation tests and ecotoxicological tests, which demonstrate that the wastewater can be treated within the framework of the existing discharge permit and company approval, as well as the environmental policy.

The amount of incoming substances are shown in Table 1 and the amount of outgoing substances in Table 2.

Consumption of electricity is calculated as read meters are adjusted by consumption for facilities with common use for several installations at Stignæs Industripark for the years 2014 to 2018.

Table 1. Summary of incoming substances related to production

Incoming substances	Unit	1/1 2014	1/1 2015	1/1 2016	1/1 2017	1/1 2018
		31/12 2014	31/12 2015	31/12 2016	31/12 2017	31/12 2018
Wastewater and sludge						
Wastewater	tonnes/year	322.997	264.126	311.286	396.232	333.369
Organic matter measured as chemical oxygen demand (COD)	tonnes COD/year	3.122	3.270	4.129	4.943	5.858
Organic matter measured as biological oxygen demand (BIs)	tonnes BIs/year	1.191	1.749	1.675	2.462	2.741
Nitrogen (incl. auxiliary substances)	kg/year	82.602	84.495	120.421	82.365	91.072
Phosphorus (incl. auxiliary substances)	kg/year	8.113	9.407	10.445	10.222	10.265
Water consumption						
Piped and raw water	m ³ /year	283.926	254.469	361.181	817.662	721.320
Collected rainwater	m ³ /year	115.772	177.454	205.544	225.217	139.476
Energy						
Natural gas	m ³ /year	13.126	9.176	14.092	19.449	17.769
Electricity (incl. room heating and hot utility water)	MWh/year	2.574	2.444	4.244	4.265	5.251
Auxiliary substances						
Iron chloride	tonnes/year	36,2	67,8	107,2	2,0	54,3
Defoamer	tonnes/year	1,08	1,08	15,1	12,6	29,9
NaOH 27.7%	tonnes/year	91	700	1.891	896	1.891
NaOH 50%	tonnes/year	-	-	-	857	1.056
75% phosphoric acid	tonnes/year	26,39	31,3	34,1	24,9	27,0
Polymer	tonnes TS/year	15,5	18,2	21,7	32,6	28,8
Sulphuric acid (96%)	tonnes/year	-	13,8	-	-	-
Formic acid	tonnes/year	0,3	0,1	0,2	3,6	0,1
External carbon source	tonnes/year	6	-	-	24	23,5
Aluminium chloride/aluminate	tonnes/year	34,2	55,3	62,1	66,8	9,0
Nitric acid	tonnes/year	2,4	38,4	-	-	-
Total of auxiliary substances	tonnes/year	210	926	2.131	1.919	3.120

Table 2. Summary of outgoing substances related to production

Outgoing substances	Unit	1/1 2014	1/1 2015	1/1 2016	1/1 2017	1/1 2018
		31/12 2014	31/12 2015	31/12 2016	31/12 2017	31/12 2018
Treated wastewater						
Water volume	m ³ /year	700.982	696.049	878.011	1.390.364	1.158.613
Organic matter measured as chemical oxygen demand (COD)	tonnes COD/year	236	88	159	153	170
Organic matter measured as biological oxygen demand (BIs)	tonnes BIs/year	10,3	8,0	6,1	5,5	5,9
Nitrogen	kg N/year	13.087	5.937	9.399	7.970	10.582
Phosphorus	kg P/year	1.386	426	778	1.313	1.408
Ammonium	kg N/year	2.032	3.324	6.072	2.815	3.823
Nitrate	kg N/year	492	420	453	103	462
Suspended substance	kg/year	5481	3431	1523	2736	2083
Chromium	kg/year	3,5	1,8	4,5	3,2	4,8
Nickel	kg/year	38,4	20,7	21,3	27,2	12,6
Sludge and other waste						
Sludge for recycling	tonnes/year	3335	3352	2525	4277	4134
Sludge for recycling	tonnes TS/year	742	823	468	812	890
Other waste for energy recovery	tonnes/year	607	129	392	302	1116*
Paper for recycling	tonnes/year	0,22	0,07	0,04	0,13	0,14
Cardboard for recycling	tonnes/year	0,07	0,82	0,51	1,01	1,30
Combustible waste	tonnes/year	3	6	3,7	11,9	7,2
Air emissions						
CO ₂ from gas furnaces	tonnes/year	30	21	32	44	40

*The large increase for 2018 is due to amended calculation principles



Table 3. Summary of environmental indicators related to production

Indicators	Unit	2014		2015		2016		2017		2018	
Output, B (removed substance)	tonnes	2.962		3.265		4.086		4.869		5.754	
		A amount	R A/B								
Energy efficiency											
Total direct energy consumption (MWh)	MWh	2.718	0,92	2.545	0,78	4.386	1,07	2.455	0,92	5.446	0,95
Total consumption of renewable energy	MWh	1.210	0,41	1.149	0,35	2165	0,53	1681	0,66	3.938	0,68
Material recovery											
Annual mass flow rate of material consumption (electrical and water consumption)	tonnes	209,92	0,07	926,41	0,28	2.131	0,52	1.919	0,39	3.120	0,54
Water											
Water consumption	m3	283.926	95,84	254.469	77,93	361.181	88,39	817.662	167,93	721.320	125,37
Annual production of waste:											
cardboard	tonnes	0,07	0,00002	0,82	0,00025	0,51	0,00012	1,01	0,00021	1,3	0,00023
paper	tonnes	0,22	0,00007	0,07	0,00002	0,04	0,00001	0,13	0,00003	0,14	0,00002
small combustible	tonnes	2,55	0,00086	6,40	0,00196	3,713	0,00091	11,89	0,00244	7,18	0,00125
Hazardous waste	tonnes	-	-	0,00	-	0,00	-	0	-	0	-
Biosludge for recycling	tonnes	3.335	1,13	3.352	1,03	2.525	0,62	4277	0,88	4134,06	0,71852
Biodiversity											
Land use, built-up area	m2	13.241	4,47	13.241	4,05	14.566	3,56	18911	3,88	18911	3,29
Emissions											
Total annual emissions of greenhouse gases:											
CO ₂	tonnes	771	0,26	836	0,256	1.063	0,260	816	0,17	1.085	0,19
CH ₄	kg	232	0,08	340	0,10	424	0,10	384	0,08	525	0,09
N ₂ O	kg	13	0,0043	13	0,0039	17	0,0042	13	0,0026	16	0,00
Total greenhouse gases (CO ₂ equivalents)	tonnes	781	0,26	848	0,260	1.080	0,264	829	0,17	1.111	0,19
Total annual air emissions:											
SO ₂	kg	129	0,04	170	0,052	170	0,042	128	0,026	210	0,037
NO _x	kg	489	0,17	637	0,195	722	0,177	725	0,149	893	0,155
PM	kg	26	0,01	42	0,013	42	0,010	43	0,009	53	0,009

B: Tonnes of removed substances in the treated wastewater indicated as tonnes COD + nitrogen + phosphorus.
Emissions originate from electricity and natural gas consumption, and are calculated based on information from energinet.dk.

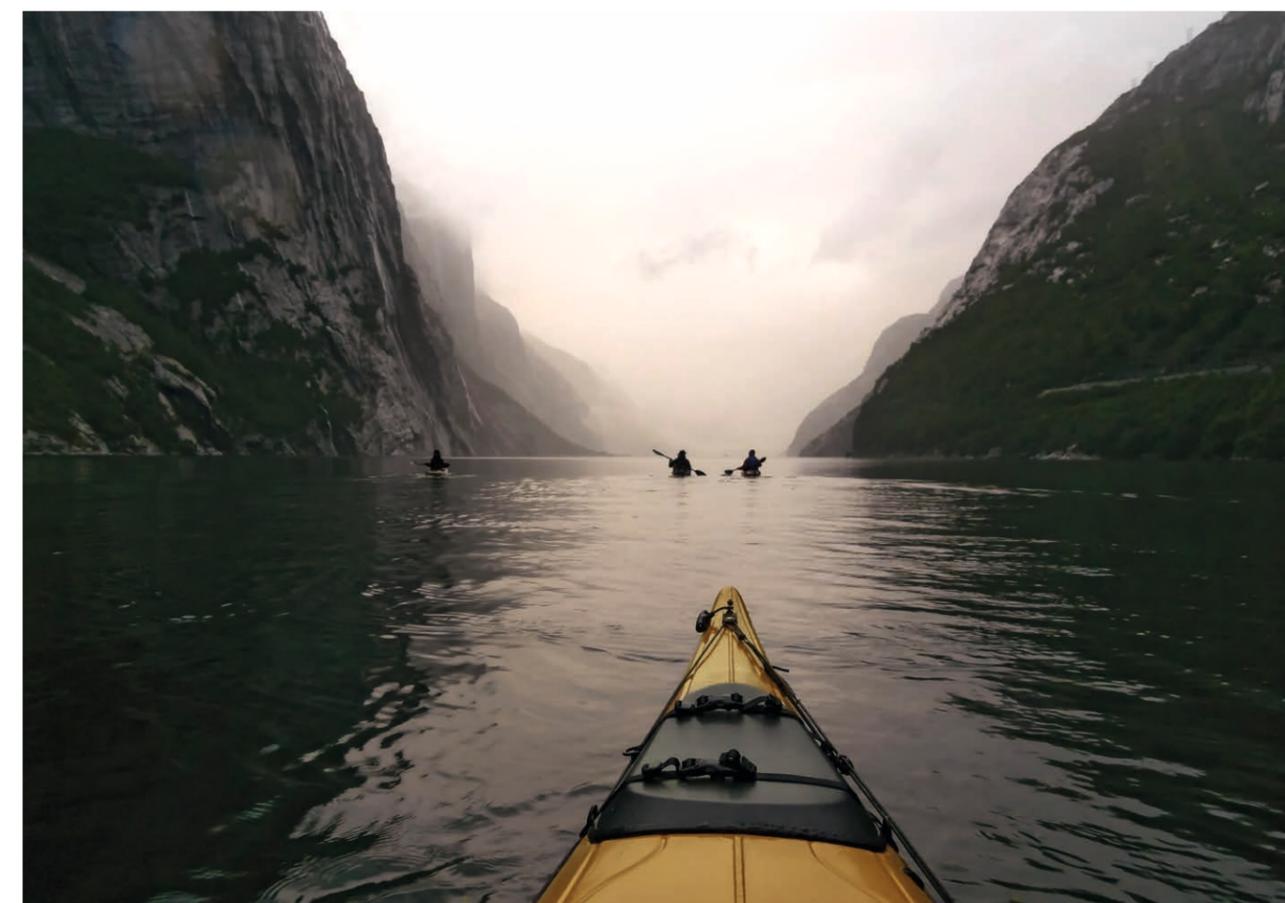


Table 4. Electricity consumption for aeration per removed substance unit

Energy efficiency and energy consumption

Energy consumption in 2005 was surveyed by COWI A/S. The criteria have been the Danish Energy Agency's requirements and guidance for energy management.

This survey and the annual environmental survey are used to set targets for greenhouse gas emissions and energy consumption at the plant.

Energy efficiency, measured as kWh consumption per kg of converted substance, is slightly higher in 2018 than in 2017. This is due to, among other things, the operation sometimes running with high sludge concentrations in the process tanks. This is sometimes a necessity, as there is high inhibition from most types of wastewater, but it is also the cause of higher electricity consumption for aeration.

Unit	2014	2015	2016	2017	2018
kWh/kg substance ¹⁾	0,87	0,75	1,04	0,88	0,91
kWh for aeration/kg substance ¹⁾	0,53	0,41	0,57	0,26	0,27
kWh/m3 discharged	3,67	3,51	4,83	3,07	4,09

1) Substance = removed amount of COD, nitrogen and phosphorus

Annual water consumption

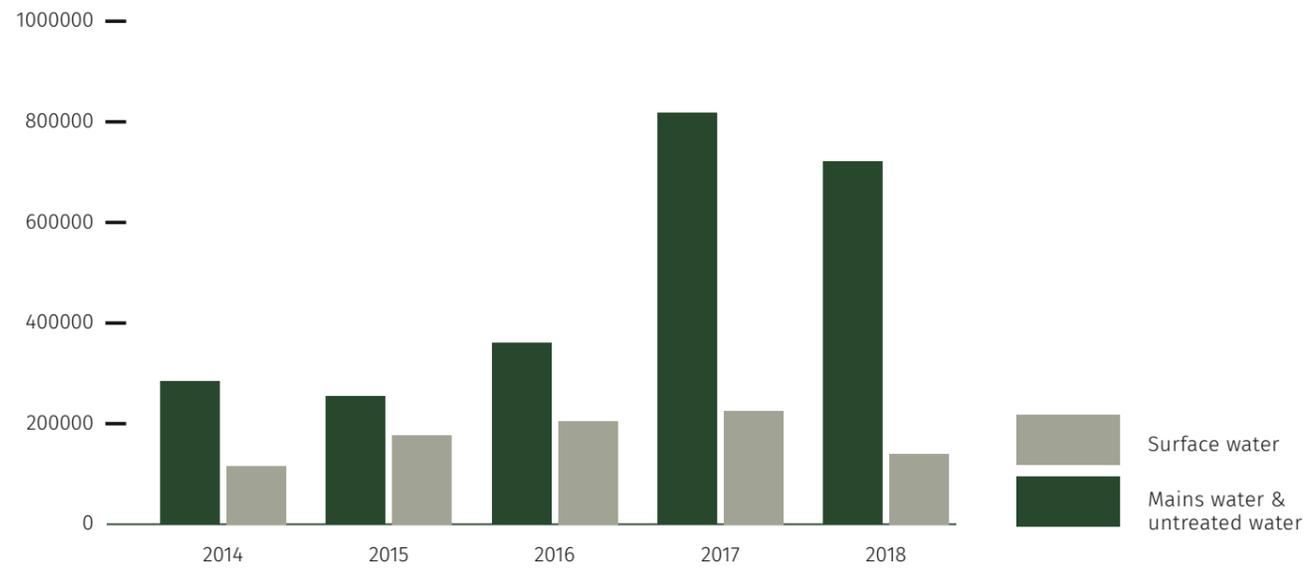


Figure 2.
Water consumption

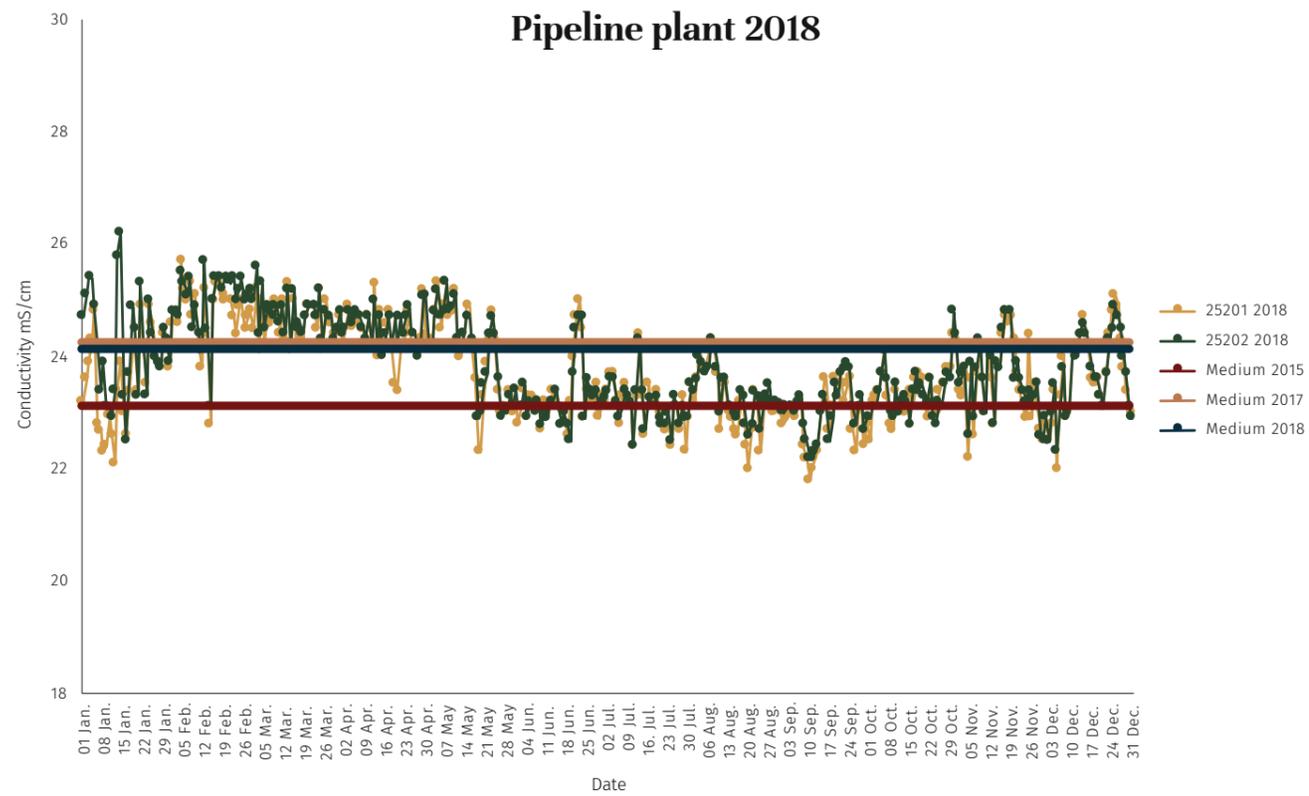


Figure 3.
Pipeline Plant



Water consumption

Figure 2 shows the total consumption of surface water and groundwater (piped water + raw water), and the consumption of piped water and raw water with associated indicators are set out in Table 3.

All rainwater from Stignsnæs Industripark's paved areas and buildings is collected, and it is used as much as possible as process water in the treatment plant, where it partially replaces the need to regulate conductivity by the addition of piped water and raw water, which is untreated ground water. Direct introduction of the concentrated wastewater is, however, the best available technology for wastewater, because the consumption of resources for transport is minimised. The concentration of pollutants (organic matter, nitrogen and phosphorous) is on average approx. ten times higher than in normal domestic wastewater.

As is apparent from Figure 3, the salt concentration in 2018 has been in line with 2017. In 2019, we will focus on increasing the salt concentration in the plant, as we see an increasing need for the treatment of saline wastewater. Regarding water consumption, we will constantly work to use as much surface water as possible.

Process optimisation, sludge properties at the plant.

2018 has been characterised by good and stable operation for most of the year. However, in September, we saw growth of testate amoebae, which gave rise to a loss of biomass in the process tanks. Increased oxygen and dosing with iron chloride helped to eliminate the problem, and over a month or so we returned to normal conditions.

Auxiliary substances – material recovery.

The use of auxiliary substances and materials is optimised at all times so that no more than necessary are used to achieve good and stable operation. See Table 1 and Table 3, where the total consumption of auxiliary substances and related indicators is listed.

Where it is environmentally sound, RGS NORDIC tries to replace chemicals and auxiliary substances with the recycling of waste substances.

Several of the types of waste received are recycled as they replace the purchase of auxiliary substances. These include the use of used lye and glycolic wastewater.

The biological process works best at a pH higher than 7 and lower than 8. The mix of received wastewater in 2018 is the reason for the increased consumption of lye. The process-

ing challenge of foam and testate amoebae is the reason for increased consumption of defoamers and iron chloride compared to 2017.

Generally, only auxiliary substances which are approved for this purpose and which comply with RGS NORDIC's environmental policy and targets are used.

In Table 3, material recovery is calculated compared to the other key indicators.

Discharge of treated wastewater

Wastewater from Stignsnæs Industripark and from external suppliers is led to the treatment plant in visible pipes or in new pressure-tested HDPE pipes. There are no uncontrolled exfiltrations/infiltrations. The treated wastewater is pumped through a buried HDPE pipeline to discharge through four diffusers at a depth of 9 m into Agersø Sound. The treatment plant and discharge are subject to extensive controls stipulated in the discharge permit. This also establishes requirements for documenting that the required emission requirements are being complied with.

Operation control is performed using online measurements of critical parameters and by laboratory analyses 2-5 times per week for all necessary chemical parameters.

Flow-proportional emission samples are taken daily. The samples are preserved by freezing. A chemical analysis of these is performed once a week, and once a month ecotoxicological tests are performed with two organisms (algae and crustaceans) of the total monthly discharge (overall control), just as an external laboratory performs a chemical analysis as an overall control.

	2014	2015	2016	2017	2018
BI ₅	98.9	99.5	99.6	99.7	99.8
COD (%)	92	97	96	97	97
Nitrogen (%)	84	89	88	86	88
Phosphorus (%)	83	94	91	83	86

Table 5. Reduction percentages

Table 2 shows the result of the drainage control indicated as an annual average of the chemical analysis, while Table 5 shows the corresponding reduction percentages.

Percentage of max. allowed

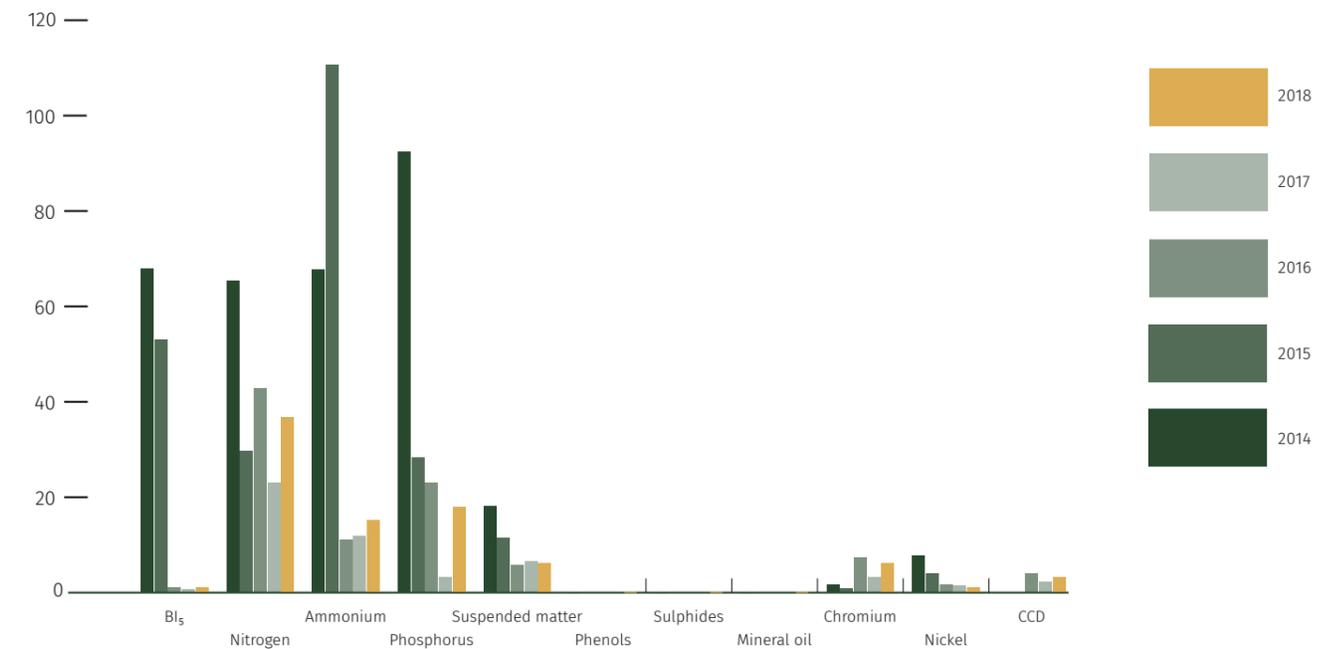


Figure 4. Emissions in relation to the required values

In Figure 4, the discharge is expressed as a % of the required values indicated as annual averages.

The discharge concentrations of the normal chemical parameters are slightly higher than the year before. This is mainly because we had testate amoebae that month, which created slightly elevated discharge concentrations compared to the rest of the year. The discharge concentrations are still significantly below the required values.

Biological sludge for recovery

In 2018, the biological sludge was recovered in the incinerator plant to produce electricity or heat.

Work is continuing with the optimisation of dry matter content in conjunction with polymer consumption.

Sludge from the heavy metal precipitation plant

In 2018, the company did not handle wastewater which needed pretreatment in the form of heavy metal precipitation. The plant has instead been used for other pretreatments to remove sulphide.

Other waste

We have sent 1116 tonnes of oil waste for recovery. Waste oil, production waste, etc. are disposed of through municipal receive-and-collection arrangements. Packaging from chemicals is returned to the suppliers. Other waste consists of packaging and office waste. The waste is sorted into three categories – cardboard, paper for recycling and other combustible waste.

Land use – biodiversity.

The company's land use, indicated in m² of built-up area, is stated in Table 3 with the associated key indicators. All buildings, as well as open and covered basins for collecting and treating water and wastewater, are included in the land use.

Air emissions

Pursuant to EMAS III, the company must account for its total annual emissions of greenhouse gases in tonnes of CO₂ equivalents, and its total air emissions of SO₂, NO_x and PM.

Greenhouse gas emissions measured as CO₂ equivalents per kg of converted substance are slightly higher than in 2017, and this is due to the increased consumption of energy for aeration as previously discussed.



When microorganisms break down substances in the wastewater in the biological plant, gaseous compounds are released, mainly in the form of CO₂ and nitrogen.

All the plant's holding tanks are covered. There will be short-lived odour emissions from covered tanks while they are filled with wastewater, just as there is odour emission from the inlet to the treatment plant.

Air emissions caused by transportation are minimised by RGS NORDIC – Industrial Wastewater by utilising the carriers' return transport. Attempts are made to try and influence customers' and suppliers' choices of transport and conveyors through questionnaires.

Soil contamination

The wastewater treatment plant has a high level of safety to prevent soil contamination. The pipework is located in an engineering passage where any leakage is discovered immediately, and the spill is pumped for treating in the treatment plant. Chemical tanks are built with a safety basin and storage tanks are coated with epoxy, which is inspected and repaired once a year.

Any spills from road tankers when unloading in the receiving tanks run to the collection well and are directed to the treatment plant.

RGS NORDIC has indemnity insurance covering any costs of a clean-up operation due to an accident.

In 2018, there has been a minor soil contamination case concerning one of the new storage tanks. A construction defect was the cause of a leakage when the tank was filled to maximum. The tank was immediately emptied and the municipality was informed. The contaminated soil has been excavated and will be handled according to applicable rules. The supplier of the tank has remedied the defect and the tank is in use again.

Significant indirect environmental impacts

The significant indirect environmental impacts are determined by identifying the wastewater treatment plant's environmental considerations in conjunction with materiality criteria.

Suppliers and customers

RGS NORDIC has always purchased chemicals and auxiliary substances from suppliers who have approved products with minimal amounts of hazardous substances. Through dialogue with customers and suppliers, RGS NORDIC has continuously evaluated the substances that end up in the biological system to ensure that the biological processes are not burdened unnecessarily, just as there is a focus on the import of wastewater often replacing auxiliary substances in the process.

In connection with the implementation of EMAS II, RGS NORDIC has prepared a questionnaire to obtain knowledge of our customers' and suppliers' environmental considerations and practices, and thereby the indirect environmental impact of RGS NORDIC. The questionnaires are included in the assessment of our suppliers. There has been good dialogue with both customers and suppliers. The survey has not changed our choice of suppliers.

A customer satisfaction survey has been conducted in 2018. 52% of the surveyed companies responded: 92.3% were very satisfied with our performance, and almost 70% responded that they would recommend us to others.

External suppliers working at RGS NORDIC have been given a folder to ensure that they know and respect the company's environmental approval and environmental policy. Furthermore, there are always verbal instructions from the operator on duty or another RGS contact person before the job begins.

Transportation of wastewater and waste

RGS NORDIC is continuously working to ensure that the transport of wastewater is carried out in the most economical and energy-efficient way.

Besides internal storage at RGS NORDIC, additional storage capacity is rented at Guldhavn for, among other things, accommodating increasing volumes of marine cargo, which is the most energy-efficient way to transport wastewater and waste over long distances. The proportion of wastewater received by ship is unchanged in 2018. The proportion of wastewater from Danish customers increased to approximately 70%.

Production	2014		2015		2016		2017		2018	
	tonnes	%								
Road tanker	35.778	11%	35.586	10%	45.998	12%	45.493	10%	46.279	12%
Ship + pump	222.556	69%	228.540	66%	265.285	72%	350.739	79%	287.081	78%
Pump	64.668	20%	83.403	24%	58.495	16%	48.747	11%	35.552	10%
Total	323.003	100%	347.529	100%	369.778	100%	444.979	100%	368.912	100%

Table 6.
Transporting wastewater



Environmental issues

Odour

There may be unpleasant odours on a regular basis from all wastewater treatment plants. The company has previously tried to minimise odours by covering the receiving tanks, holding tanks and bioreactors.

In 2018 there have been four odour complaints, only two of which were odours from the water plant in connection with receiving wastewater. The other two originated from other nearby locations.

The target will always be 0 external odour complaints, and there will still be daily odour checks in areas surrounding the plant.

Noise, dust, heat energy and visual impact

There have been no major issues of this kind from the wastewater treatment plant in 2018, and there have been no complaints from neighbours in this respect.

Accidents with environmental consequences

There have been no process incidents with inadvertent environmental consequences in 2018.

An overall risk assessment of the plant was conducted in 2016, and renewing it has not been considered relevant in 2018

Discharge of treated wastewater

Internal and external controls confirm that RGS NORDIC operated within the framework of the relevant environmental permits and other relevant law.

Environmental accidents

The prevention and reduction of environmental accidents

RGS NORDIC has prepared environmental reports for the wastewater treatment plant for the past 18 financial years, and there have been no serious environmental accidents.

All staff at the wastewater treatment plant are involved in the company's daily work on the environment and health & safety because it is a natural and necessary part of the work at a plant with few employees who treat chemical waste and wastewater.

There will be six-monthly safety meetings for all staff in the division.

The above factors provide excellent prevention and limit environmental accidents, and the wastewater treatment plant did not receive orders or warnings from the environmental authorities in 2018.

Contingency plans in the event of an accident

RGS NORDIC is a modern chapter 5 company with a production facility which meets regulatory requirements on contingency plans.

RGS NORDIC shall review the contingency plans for the wastewater treatment plant annually in relation to the company's development. A contingency exercise was held in 2018 and the contingency plan was reassessed, but it did not result in any significant changes.

Informing and training of staff on environmental issues

External training of the plant's staff was carried out in 2018 with emphasis on the operation of the biological plant, sludge treatment, waterworks operations and management. Management participates in experience groups with staff from other treatment plants. 3-4 environmental follow-up meetings are also held each year with the following fixed agenda items:

- Ongoing follow-up
- Deviations and corrective action
- Follow-up on environmental targets
- Proposals for environmental improvements

There is training for new staff that includes the following points:

- Introduction to system and safety
- Training

Management system

RGS NORDIC has always worked on the basic premise that the companies at Stignæs Industripark should work to protect the environment in such a way that both society and the companies which are customers of RGS NORDIC can be confident in the work performed by the company.

RGS NORDIC has always worked to ensure the construction of an environmentally friendly industrial park with all the necessary permits and facilities to comply with Danish environmental law.

For years, RGS NORDIC has presented green accounts, and in the 1999/2000 financial year, the company's wastewater treatment plant was certified according to ISO 14.001 and EMAS on the basis of an initial environmental review and our environmental management system.

In 2004, the wastewater treatment plant's management system was merged with RGS NORDIC's other management systems.

System design

The company has a quality, environmental and health & safety policy which describes its general positions regarding customers, quality and the environment. The company sets environmental targets based on these policies and other significant factors. On the basis of the targets, a number of action plans are drawn up for the affected areas. Management evaluates targets and action plans and other environmental aspects of the organisation's activities at appropriate intervals.

The policies are reviewed annually and the coming period's targets and objectives are set based on previous evaluations.

An independent management system for RGS NORDIC – Industrial Wastewater was devised in 2007-2008.

In 2010, EMAS III was incorporated into the management system.

In 2012, wastewater laboratory DANAK's accreditation according to ISO 17.025 was incorporated into the management system. Discontinued in 2018.

In 2015, RGS NORDIC – Industrial Wastewater again became part of RGS NORDIC, with an independent management system for the environment and quality as the Division for Industrial Wastewater.

In 2017/2018, the new Annex to EMAS III of 28 August 2017 has been incorporated into the management system.

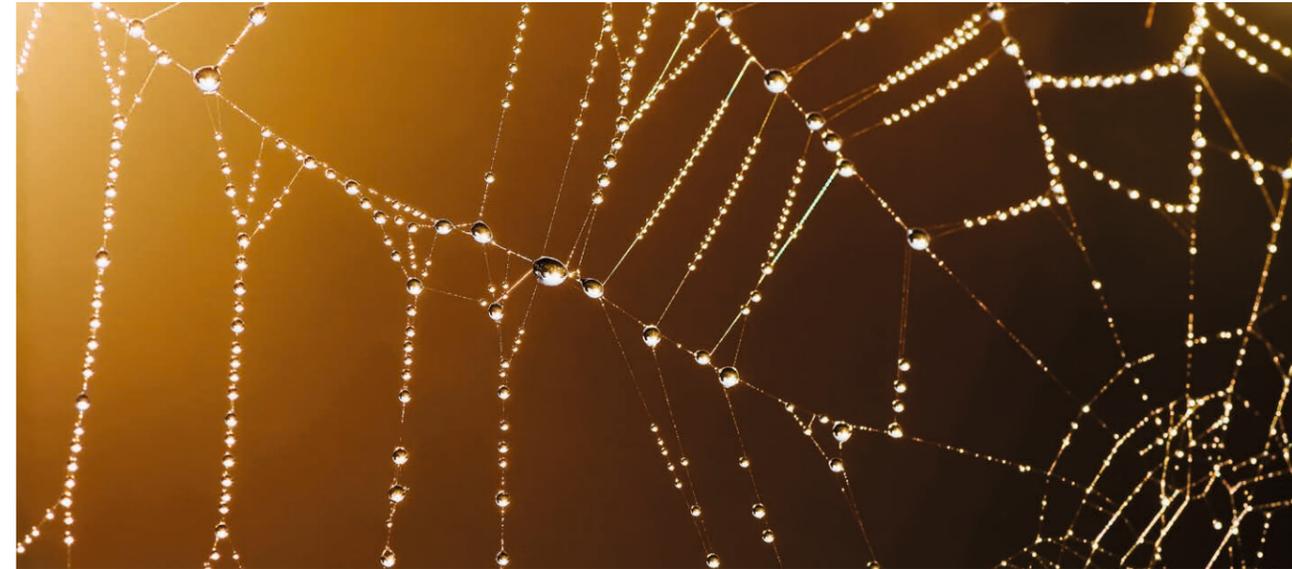
The RGS NORDIC management system consists of key processes and support processes. The key processes contain or refer to job descriptions which are necessary in order to comply with management's principles for the operation of the certified areas.

The supporting processes are procedures for the management system, which set out guidelines for how management's principles are to be followed.



Environmental targets and objectives for 2018

Objectives	Achieved	Remarks
Explore the potential for biogas production and develop a business case for this	Yes	Tests have been conducted and they have shown that biogas production can begin from our own sludge, but the yield is not sufficient to support investment.
Explore the possibility of using more surface water instead of raw water	No	The project has been put on hold as there have been other, more important projects.
Explore the possibility of receiving wastewater with larger amounts of oil (both Class 1 and Class 3 products) – Increase opportunities for separating oil for recycling	Yes	An agreement has been concluded with SGOT to rebuild two tanks to be Class 1, which we will then rent: one for separating oil and water, and the other for storing and exporting the Class 1 oil.
Explore alternative commercial potential of sludge	Yes	It has been decided to seek investment in an energy recovery plant. We will thereby reduce transport considerably and we will have a surplus of energy in the form of heat.



Health & safety targets and objectives for 2018

Objectives	Achieved yes/no	Remarks
Workshops about Discovery Insight profiles for all staff – develop good working relationships	Yes	Everybody has had a profile created
Purchase of a lifting device for Manitou	Yes	A lifting device for Manitou has been purchased
Certification according to 'Best place to work' – preliminary survey in relation to improvement	No	There have since been some changes in staff, both in HR and Environment, who were responsible for this project

Environmental targets and objectives for 2019

Objectives	Achieved yes/no	Remarks
Explore the possibility of using more surface water instead of raw water		
Implement SCOT (Sludge Compliance Optimisation & Traceability)		
Increase the conductivity of the plant from 23.6 to 25 mS/cm – reduce water consumption		
Climate accounts for water treatment – we have documented climate accounts for water treatment at Stigsnæs		
The project for the receipt of Class 1 products has been carried out		
New storage tanks – in service		

Quality targets and objectives for 2019

Objectives	Achieved yes/no	Remarks
TOC max. 30mg/L, annual average		
Increased focus on the stability of lab equipment – procedure for internal service on "the seal"		

Health & safety targets and objectives for 2019

Objectives	Achieved yes/no	Remarks
Safety walks – JCOP, PLPE, PTES, JENI, PKRI, MHAN, CLCH – the overall target is min. one a month with one operator/laboratory technician		
Close to observations – systematised – min. one per person per month		
Monitor and publish accident absence statistics for Water Solutions		

Development of the environmental management system

RGS NORDIC's aim with the environmental management system is for it to help focus more on the environment in daily operations. This is done by developing the environmental management system through continuous discussion about the environment and the system's performance with staff.

In 2004, the management system for the wastewater treatment plant was merged with RGS NORDIC's management system for the company's other plants, while in 2007-2008 an independent management system was established for RGS NORDIC – Industrial Wastewater.

In 2018, there was a decision to discontinue the accreditation of certain laboratory tests according to ISO 17.025.

In 2017, the Division for Industrial Wastewater became part of RGS Nordic's CSR certification according to ISO 49.001

The environmental report is no longer issued to all customers and suppliers, but can be downloaded from the company website and is available in hardcopy if desired.

In future, the system should serve as inspiration for staff so that new ideas and opportunities which are not necessarily directly related to daily operations are constantly incorporated into the system for the benefit of the environment, the division's staff, customers and suppliers.

Statement of performed verification and validation

Verification no:
156575-2014-AE-DEN-DANAK

Initial certification date:
16, May, 2012

Valid:
07, August, 2019 - 07, August, 2022

DNV GL Business Assurance Denmark A/S, who is registered as an EMAS-environmental verifier no. DK-V-6001 including NACE rev. 2: 37.00, hereby declares to have verified, that the on-site-area or the whole organization, as specified in the updated environmental statement from the organization

RGS Nordic A/S

Registration number: DK-000181

complies with all the requirements of the European Parliament and Council Regulation (EC) No. 1221/2009 of the 25 November 2009 allowing voluntary participation in a Community eco-management and audit scheme (EMAS III) as amended by Commission Regulation (EU) 2017/1505 of 28 August 2017.

DNV GL hereby confirm that:

- The verification and validation are performed in full compliance with the requirements of the abovementioned regulations (EC) no. 1221/2009 and (EU) 2017/1505.
- the outcome of the verification and validation confirms that there are no signs of non-compliance with applicable environmental legislation
- data and information in the updated environmental statement dated 02-05-2019 gives a reliable, credible and accurate picture of all organizational operations within the scope specified in the statement.

This document cannot be considered an EMAS-registration. EMAS can only be registered by the registration body pursuant to (EC) No 1221/2009. This document can not be used as a public statement, on its own.

Place and date:
Hellerup, 28, May, 2019



For the issuing office:
DNV GL - Business Assurance
Tuborg Parkvej 8, 2., DK-2900, Hellerup,
Denmark

Jesper Schultz
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance Denmark A/S, Tuborg Parkvej 8, DK-2900 Hellerup, Denmark. TEL: +45 39 45 48 00.
<http://www.dnvgl.com/assurance>



PurePrint® by KLS
Produced 100% biodegradable
by KLS PurePrint A/S

This publication is Cradle-to-Cradle-certified
This means that the publication is part of the
Earth's life cycle before, during and after use.