Read more about the advantages of our systems in the brochure

Discover the sewage solutions of the future at livingearth3000.com

Raita Environment

BioKem

Raita's treatment plant produces a small carbon footprint and has low operating costs - 13 years of experience in Ylöstaro shows this

Renovating old systems with Raita's sewage treatment plant is relatively easy - a good value option was chosen for property in Karttula

A joint BioKem XL plant for several properties - a cost-effective one system to solve the sewage problem

BioKem is an efficient treatment plant with significant savings over the year - sewage sludge is expensive to transport

CE

EN 12566-3

Wastewater treatment, sludge drying and composting.
Solutions for detached houses, holiday homes and larger properties.

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Raita Environment

BioKem sewage cleaner

Highly efficient system
The plant effectively cleans organic materials and nutrients (phosphorus and nitrogen).

No costly sewage transport
The waste water is treated in an environmentally friendly manner directly on site.

Low energy consumption
BioKem has a customized operating system. Electricity consumption, chemical consumption and the operation of the technical
the equipment is controlled based on the current load of the system.

The sewage sludge is treated and recycled
The sludge is disposed of through composting, directly in the treatment plant - thus there is no need for
transport for sludge.

Long service life
The lifespan of the facility is very long, between 50-100 years. Our maintenance system of spare parts, consumables and service ensure a long life for BioKem.

The material can be recycled.
The containers are produced from PE plastic which can be recycled, either as plastic raw material or as energy.

Cheap in purchase and operation
BioKem costs less than half in purchase and operation than a traditional sewage system (with regular sewage/sludge emptying) or a municipal sewer costs.

Operating costs are low
The cost is approx. 1-3 €/m3 wastewater (chemistry, electricity and maintenance) if sludge processed/composted and used where the facility is located.

CE

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Environmentally friendly with a low carbon footprint

The carbon footprint of RAITA's BioKem system is very small, it is even less than connecting the drain to the municipal sewage treatment plant.

Half of all costs for wastewater treatment consist of transporting sludge. There is thus a significant energy and handling cost that disappears by treating wastewater directly on site, not to mention the environmental impact that does not occur.

Raita

Raita - Biokem

Raita Environment is a specialist in sewage and environmental technology

Our passion is to develop and manufacture environmentally friendly, sustainable products and methods around sewage. With our systems, we want to leave as little carbon footprint and environmental impact as possible. In addition to the environmental benefits, our products are also affordable. Waste and wastewater is cleaned and disposed of close to where it originates. In this way, acquisition and operating costs of our systems are affordable, secure and independent.

Our business started in Finland in the 1950s in water technology. Over the decades, our business and areas of expertise have developed and refined to be what we are today, a manufacturer and expert in sewage and environmental technology.

Our company is known as a reliable and respected operator/partner where hundreds of thousands of our products are used in Finland and abroad.

Raita's treatment plant produces a small carbon footprint and has low operating costs – this is shown by 13 years of experience in Ylöstaro

Connecting to the municipal sewage systems or having a septic tank with the discharge of a sludge truck are not the only options for managing a property's sewage treatment. A significantly smaller carbon footprint can be achieved by building a reliable treatment plant directly on site with a long service life.

Jari Mäkynen invested in RAITA BioKem's treatment plant in 2010.

- In 2010, Raita's wastewater treatment plant was the only system on the market that did not need to be emptied by a sludge truck according to the marketing. We invested in the larger system that collects the excess sludge in a tank.

Raita Enviroment promised that the treatment plant is more or less self-running with only a few monthly checks. I can now say with hindsight that it is true, the treatment plant has worked perfectly. Only a few wear parts have been replaced. Raita's system sounded almost too good to be true at first, but so far it has worked as promised.

As always, the human is usually the weakest link, people neglect to read manuals and unfortunately I have to "crawl to the cross" as it seems to be a real problem even for a graduated engineer, laughs Mäkynen.

In 2021, the second RAITA BioKem treatment plant with sludge drying and composting was installed at Mäkynen's older farm building.

- Last summer it was discovered that the septic tank that was built in the 70s had reached the end of the road. I sent an email to Raita, as we were happy with their previous facility and asked when it would be possible to install? We exposed Raita to competition, but because our user experiences from our previous treatment plant were so positive, the lot fell on them again. You know what you have but not what you get if you change supplier, Jari laughs.

Mäkynen signed an annual maintenance contract for the treatment plant.

- I could manage the service myself, but I can't bear it. The advantage of a service guy who comes and fixes is that he has all the spare parts ready, he knows what needs to be done and the chemicals are delivered at the same time. That way I save the shipping cost on them as well.

The service contract costs as much as it would cost to empty a septic tank, so the decision was not that difficult, says Mäkynen.

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Bioprocesses; aeration, nitrification, denitrification of organic material occur one after the other.

Bioprocesses:

All wastewater from the properties is directed to the treatment plant. The first tank in the treatment plant is pretreatment of waste water.

BioKem monitors the incoming wastewater and automatically adjusts its operation in case of changes in usage. Aeration of the organic material in the wastewater and oxidation of nitrogen, i.e. the nitrification process (with fine bubble aeration), starts automatically. During aeration, the activated sludge in the process tank is mixed with the pre-treated wastewater. Then the bioprocess starts and the growth of microbes in the activated sludge uses organic material as food.

Nitrification takes place by oxidizing nitrogen. Air line out into the water leaves the treatment plant through the drain ventilation to the roof of the building. All bio processes are odorless and natural. The speed of the process is improved if the conditions in BioKem are the best possible.

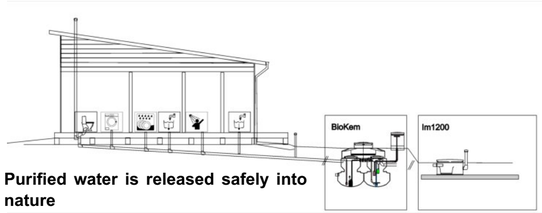
A chemical process continues alongside the biological processes.
During aeration, RAKE iron chemical is dosed to separate phosphorus. Final aeration starts the clarification, during which activated sludge (biosludge) and phosphorus (chemical sludge), which are reactive with RAKE, settle to the bottom of the process tank.

Clarification
The water treated with BioKem processes is clarified. At the same time, the last of the bioprocesses takes place, denitrification, when nitrogen is reduced as a gas to the air.

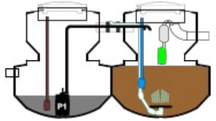
Removal of treated water from the treatment plant
To finish the clarification, the purified water is pumped out of the treatment plant. Part of the purified water is separated in a monitoring bottle. It is easy to check operation and efficiency with this follow-up test. The sample is collected with each pump out.

Automatic functions during standstill
BioKem has automatic functions to maintain biological readiness during times when wastewater does not enter (stop time). BioKem automatically supplies air and waste water to the process tank during downtime.

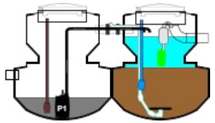
Load balancing functions
BioKem is self-regulating, that is, it adjusts the amount of treated water and the frequency of processes automatically.



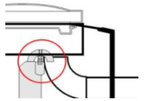
Purified water is released safely into nature
The purified water can be piped directly into an open ditch or absorbed/filtered through simple infiltration into the terrain. The degree of cleaning is also sufficient for sensitive areas (beaches and groundwater areas).



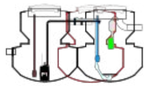
Additional cleaning is possible, the so-called third stage (e.g. particularly sensitive coastal areas, groundwater areas), ensures even better cleaning and disinfection of the outgoing water.

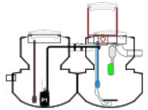


Sludge treatment
The sludge in BioKem is odorless and stabilized in bioprocesses. The amount of excess sludge is small, 0.3 - 0.1% of the amount of treated wastewater (1-3 l/m3). Sludge treatment is connected to BioKem automatically removing excess sludge from the process tank.



Sludge is collected in a separate tank, for emptying with a sludge truck for municipal treatment. The size of the tank is dimensioned for a suitable emptying interval. Or the sludge is dried and composted at a treatment plant, in which case emptying with a tanker is not necessary





Raita

Raita - Biokem

Are you wondering what type of solution would suit your property?
We have extensive experience with many different types of systems. We develop and manufacture treatment plants for gray water and mixed waste as well as biotoilets and composts. We specialize in environmental technology. Our long-term experts will be happy to discuss with you which solution suits you.

RaitaPro helps you!
There are many different solutions to implement a sewer and drainage project. We specialize in effective methods that can be adapted to the needs of the property and the customer. In many cases, we can use existing wells, sewer pipes, etc.

A well-planned project reduces costs during construction and operation

It was easy to renew the old system - the result of the process is clean water and some compost. Nothing to drive away!

- Our environmentally friendly sewage systems are attracting a lot of interest, says Ilkka Raita. A good example of how to renew the existing sewage system in an old property is Lehto and Taussi's villa in Karstula.

The property's sewage system needed to be renewed.

The house in Karstula was built in 1949. It is now used as a holiday home by two families, Lehto's from Vantaa and Taussi's from Kotka.

The old sewage system was outdated and did not work satisfactorily. A friend recommended Lehto approach Raita Environment in the matter.

Design and authority management came from Raita and installation was made easy with the help of a local company

- Raita took care of the planning and granting of permits as well as project management, which the authorities then included in the permit conditions.

- Update of the old sewer and installation of the treatment plant was managed together with a local contractor.

- We chose Raita's system with sludge composting because we wanted an affordable solution in terms of operating costs. We wanted to use the sludge as compost in our own garden.

The system has worked perfectly

- Our BioKem system was started up in the summer of 2020 and has been operating ever since. We also participate in Raita's maintenance program and the interval for the treatment plant is every two years.
In connection with the maintenance, wearing parts are changed, the technology is reviewed and the cleaning process is checked.

- There have not directly been any problems in practice, a few times we have adjusted some things in the operation of the treatment plant, otherwise we have only managed the monthly check and the emptying of the sludge compost.

- We are very satisfied with Raita's package solution where planning, mapping, approval and permits went smoothly. Raita was very helpful and supportive in the execution of the project as well as installation supervision, summarizes Lehto.

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FAQ. Here are the answers to the most frequently asked questions

How do I choose a sewage system? Which system is right for me? Is an official permit required? Can I do it myself? Can I get design/construction help?
Raita offers free remote mapping and in connection with the survey you will receive written information about the RAITA systems that are suitable for your needs. We also help with any authorization from the authorities. You can complete the project in whole or in part yourself. Through us, in addition to mapping, you can get help with planning, installing equipment and building an entire system

How do I choose the right BioKem model?
The use of the property can vary and this affects how the treatment plant is dimensioned. The cleaning facility must be dimensioned according to the maximum load. BioKem treatment plants have an ingenious control system for that, the consumption of electrical-chemical-technical equipment is simply controlled according to the load situation and automatically changes its functions. This means that it does not dose too many chemicals or use pumps constantly, all to make it as efficient as possible.

How environmentally friendly is BioKem?
BioKem is the most environmentally friendly choice of treatment plant (based on available technology). See the effectiveness of BioKem's cleaning. Other: You save money on missed sludge discharges and waste water transport. The energy requirement is very low. Waste is disposed of on site (no infrastructure needed) - see composting options for sludge treatment. Long lifespan (50-100 years). The material is recyclable.

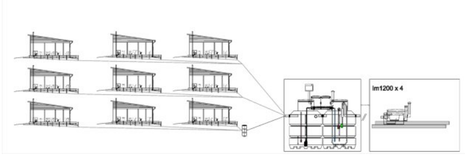
Book an appointment for remote mapping:
+358 400 912 111 - helpdesk@raita.com

Taking these factors into account, BioKem's carbon footprint is very low, a fraction of the carbon footprint of municipal wastewater treatment.

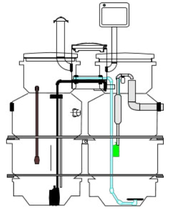
Care and maintenance of BioKem - is it complicated and laborious?
The functions related to normal operation, i.e. checking the treatment plant's signal lights and inspection once a month, are not particularly laborious (takes approx. 5-10 min). Regular emptying of the sludge compost/container replacement every 4 to 12 months has been made easy. It usually takes 15 to 30 minutes. You can also do maintenance yourself if you are used to technical work.

Acquisition and operating costs?
Getting a BioKem treatment plant is cheaper than getting a toilet/closed tank/drainage connection. Operating costs are low (1-3 €/m3 for chemicals, electricity and maintenance) the waste can then be easily composted and used on site.

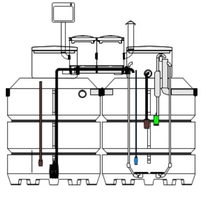
Renew the old sewage system - does it make economic sense?
It often makes sense, book an appointment for remote mapping, we are happy to help with planning and review the conditions for your facility. With the right planning and commissioning, BioKem also causes no smell, neither indoors nor outdoors.



BioKem 0.85



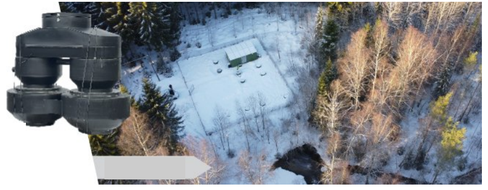
BioKem 2



BioKem 6

Raita

Raita - Biokem XL



Raita Environment offers free remote mapping!

With the help of remote mapping, the right technological solution can be designed to meet the needs of the property and its residents.
With our methods and solutions, it is possible to reduce the amount of excess sludge and thus make the emptying interval longer. All sludge can also be processed directly on site at the property, which in turn saves money and reduces emissions during transport.

Book an appointment for remote mapping - we will be happy to help you!

The lifespan of the system is usually long, anything between 50-100 years is normal. Spare parts can be replaced and the equipment can also be reprogrammed and expanded as needs change.
The system should be properly planned, it makes the project financially sustainable and ensures construction and use over time.

A joint treatment plant is usually the most affordable solution for sewage treatment

With the help of remote mapping, the right technological solution can easily be designed to meet the need where several properties are included.

It is an economically sound option for everything from smaller facilities in smaller towns to the largest systems for smaller cities with thousands of inhabitants. The purchase and operating costs of a joint treatment plant are usually a fraction of the cost of the connection to a municipal treatment plant. It is also often significantly cheaper than having small separate property-specific purification systems.

Top class cleaning results
The treatment plant's performance is equivalent to municipal treatment plants in large cities, but the environmental impact is significantly lower because the wastewater does not need to be transported and the load at the discharge point is lower.

Remote monitoring possible
Sewage plants are often equipped with remote monitoring so that operation can be controlled automatically. This is very cost effective.

Units for rent
Raita also supplies "container treatment plants", where all or parts of the technology are already placed inside the container. These containers are usually rented, but they can also be purchased where the project requires it.

Service and maintenance
RAITA BioKem XL plants are supplied with commissioning and training for use. They are also covered by our maintenance program during their lifetime.

Design and installation services
Our delivery often includes design and installation services. Remote mappings are always included and at no extra cost.

Experience the BioKem XL treatment plant
If you want, we can arrange a presentation for you where you can see and experience how waste water is cleaned in our treatment plants.

All RAITA BioKem XL plants are delivered with a performance guarantee.

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SLUDGE TREATMENT

BioKem has a sludge treatment system

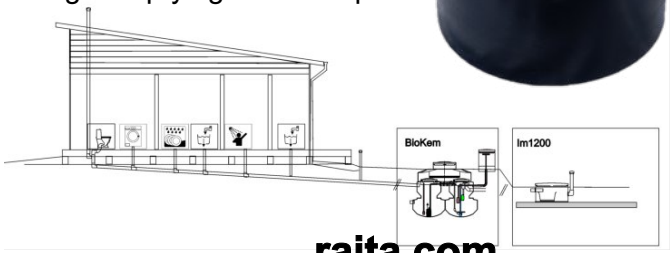
The sludge from the treatment plant RAITA BioKem is odorless and stabilized in bioprocesses.
Excess sludge is produced in small amounts 0.3 - 0.1% of the amount of treated wastewater (1-3 l/m3). The sewage treatment plant has a sludge treatment system, which reduces the amount of sludge and removes excess sludge from the process tank.

Sludge is collected in a tank (1)
From there it is then emptied by a sludge truck for further transport for municipal treatment.
The size of the tank is dimensioned to have reasonable emptying intervals

(1)

(2)

The sludge can also be dried and composted (2)
That way, no one is needed sludge emptying and transport



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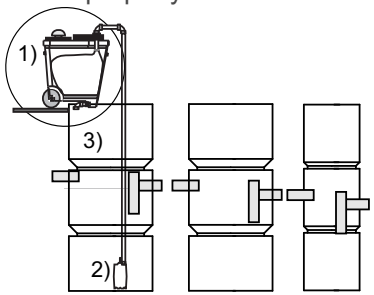
Sludge dryer for sewage sludge

For collecting, drying and composting sewage sludge.

Sludge dryer

The sludge from the septic tank is separated in a sludge dryer (1) where the liquid/water is pumped out (2) and flows back to the well (3).

The sludge is dried and composted on site at the property.



Delivery contents: The SAV1 delivery includes a mud dryer with cover, ventilation cap, 2 filter bags, 32+ mm pipe parts 4 pc32x1000 pipes,4 pcs 90x32+ corners. Dimensions: Volume approx. 150 l, length 500, width 800, height 600 mm, weight 15 kg.

EXPERTENS ÅSIKT

The "slam rally" in the archipelago is exhausting both nature and the wallet!

Enligt Pargas miljökontor är det smartaste för miljön och ekonomin att återföra näringsämnen till landet och tillvarata dem lokalt.

Sludge treatment on site pays off!

The primary objective is to treat the sludge on site near the property to avoid expensive and not environmentally friendlytransportation. The payback period for this new technology/product you count home relatively quickly.

- Archipelago residents should consider handling their sludge on their own, as long as it is done correctly and the sludge recycling is reported to the municipality, there is money to be saved, Huovila sums up.

There are almost a hundred permanently inhabited islands in the Archipelago Sea without land road connection. All transport is challenging as we rely entirely on connecting ships and our own boats.

During the summer, the population on the islands and the capacity on them double municipal sewage treatment plants will be extreme. It becomes a concern when the drain is not dimensioned for these changes.

- Sludge is waste and must not be released into nature or onto a field. Thus must the sludge is transported from the outer archipelago to a treatment plant inland, which becomes expensive because only part of the sludge from the property can be transported away at a time, says Petri Huovila, environmental inspector in the city of Parainen."

The goal is to treat the sludge at its place of origin

According to Parainen's environmental office, the smartest thing for the environment and the economy is to return nutrients to nature and take care of these locally. Then comes comes sludge transport with vessels to be eliminated and the cycle on the islands will remain in balance.

- The nutrition has come from the earth and must be returned there. Municipal treatment plants discharge treated sewage into the sea, but even if it is treated to 90%, nutrients nevertheless negatively burden the oceans and their inhabitants. It is better that the nutrients are taken up in the soil at one's own property, emphasizes Huovila.

The payback period for this new technology is short

There are methods for handling sludge in an environmentally friendly way and according to regulations on their own site at the price of some sludge transport by boat.

- A so-called sludge dryer can be used for the sludge separators, then pumped the contents of the well up to the mud dryer and the liquid flows back into the well. The recycled sludge can be composted at your own property, says Huovila.

However, the sludge dryers are not suitable for use with closed ones tanks (wc – water). If you want to get rid of sea transport, you have to change the closed tank to a sedimentation tank and install a sewage treatment system. Self-draining sludge must always be reported to the waste authority/ the municipality.

- It is easiest if the property has a biological (dry) toilet and that more or less only wash water is generated. Solids from the precipitation tank for gray water can then be scraped into the compost. Today there is one several greywater treatment cleaners of various sizes where sludge collects in the filter and where no sludge emptying are needed.

Archipelago residents should consider handling sludge on their own, as long as it is done in the right way and the sludge recycling is reported to the waste board, summarizes Huovila.

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