



Probiotic Technologies For Waste Treatment

www.organicsolutions.in

“ Creating a healthier India for future generations ”

About Us

We are an organization committed to providing our clients with efficient, sustainable and cost effective solutions to waste management issues.

- One of the pioneers in waste treatment since 2001
- Specializing in sewage & solid waste treatment using special cultured microorganisms under the brand name *OS1 dms*
- Office located in Gurgaon, Haryana, India.
- Providing services to over 50 prestigious clients, including government bodies and leading players in the private sector.

Providing “Organic” Solutions to Waste Problems

We have engineered a special mix of pro-biotic microorganisms that decompose/digest complex organic matter.

OS1 *dms*® bacteria are pro-biotic bacteria (good bacteria that are present even in human body)

- Naturally occurring non-toxic mixture of beneficial microbes
- Has the ability to quickly consume/digest a variety of organic matter
- Not harmful to human or nature – non pathogenic
- Reproduces quickly in the conditions present in waste disposal systems
- Removes foul odor



Our Services

Areas of Expertise

Sewage Treatment

- Anaerobic Methods
- Aerobic Methods
- Enhancement of Existing plants

Solid Waste Treatment

- Composting

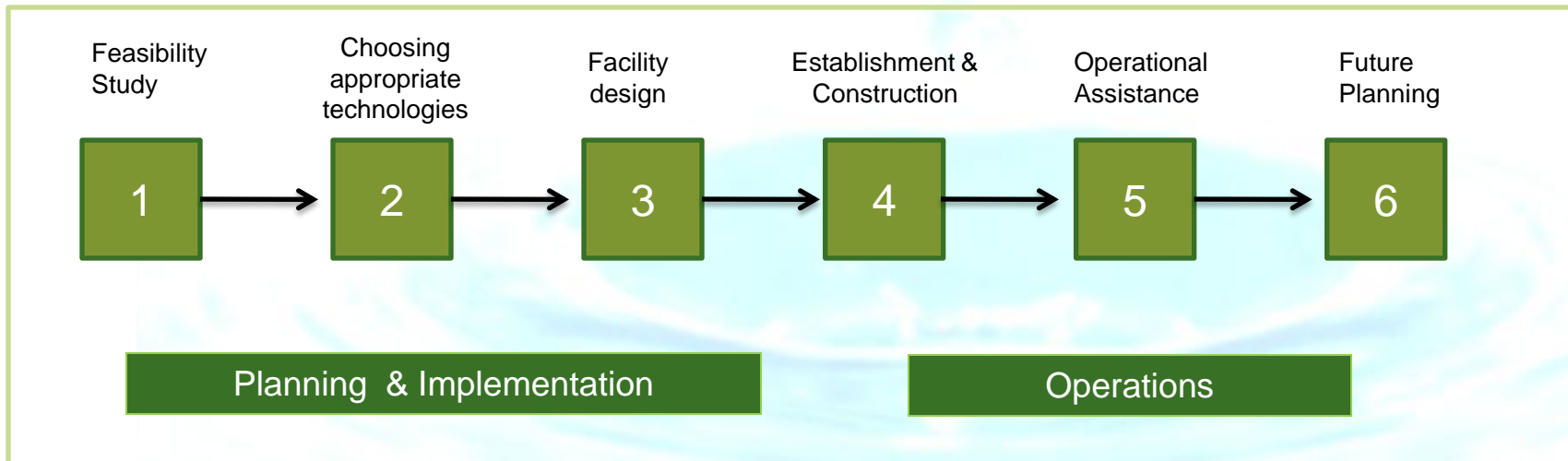
Foul Odor Removal

- Landfill Sanitization,
- Reduction in flies and pests

Bioremediation

- Existing Aerobic Centralized Plants
- Water Bodies

Complete Solution



OS1 *dms* – Fermentation Technology

- ✿ **We use fermentation technology (facilitated by special OS1 microbes) to treat organic waste of all kinds like sewage, solid waste etc**
- ✿ **Fermentation** is a process by which facultative microorganisms (e.g., yeasts etc.) transform complex organic molecules (e.g., carbohydrates etc.) into simple organic compounds that often can be absorbed directly by plants.
- ✿ **Fermentation** yields a relatively small amount of energy compared with aerobic decomposition of the same substrate by the same group of microorganisms. On the other hand aerobic decomposition results in complete oxidation of a substrate and the release of large amounts of energy, gas, and heat with carbon dioxide and water as the end products.



Sewage Treatment



Anaerobic Sewage Treatment



Decentralized Anaerobic Sewage Treatment

Managing your water footprint

...

www.organicsolutions.in

Decentralized Sewage Treatment

- Decentralized Waste Water Treatment

- By distributing the infrastructure of waste water treatment, you avoid the necessity to maintain a grid.
- Saves expenditure on pumping and sewer lines and has minimal maintenance.
- Reduces the chance of complex contamination
- By treating waste water in a decentralized way neighborhood assets requiring irrigation can receive the treated discharge, which in turn can percolate underground and refill aquifers.
- Treated water can be used for –
 - Horticulture and irrigation purposes
 - Toilet flush supply

Decentralized Sewage Treatment- Case Study

Residential Complex, MANESAR

- The project has adopted decentralized technology to save on the piping, pumping and electricity costs that they would have to bear in a centralized system.
- The decentralized technology is most feasible for the township, as the occupation will happen in phases, and to construct a centralized plant of full capacity and then operate it is a very costly proposition. as adopted decentralized technology to save on the piping, pumping and electricity costs that they would have to bear in a centralized system.
- Each cluster of houses is connected to a local STP, and the treated water is used in the neighboring landscape.



Decentralized Sewage Treatment- Case Study



Cluster of houses connected to STP



Sewage Treatment Plant



Water being used for horticulture purposes

Why choose us?

We provide cost effective solutions as compared to conventional electricity and labor dependent technologies

- Gravity based system
- No aerators, heavy mechanical equipment required
- No technical labor required

We provide solutions where centralized treatment is not feasible -

- Smaller communities which need more cost effective options
- Areas with difficult terrains (for example mountainous areas)
- Areas with sparse population/ spread out population
- Areas where existing on-site systems (septic tanks) are functioning and do not need to be replaced
- Areas where settlement is happening in phases (townships, SEZs etc)
- Areas that are not connected to the city sewers and in turn to the centralized plants
- Individual commercial establishments (Schools, Colleges, Universities, Factories, Hotels etc)

High quality results

Parameters	CPCB norms for irrigation	Result Achieved by us
BOD	100 mg/l	<30 mg/l
COD	Not Specified	<60 mg/l
TSS	200 mg/l	<50 mg/l

Fermentative Anaerobic Baffle Reactor (FABR)

We have engineered a special technology for sewage treatment which is based on the natural process of fermentation.

Our special technology is a replacement to conventional electricity and labor dependent technology.

Just like a natural eco-system, our technology uses pro-biotic microorganisms to treat the waste.

Treatment takes place in a baffle reactor (usually constructed underground) and does not require heavy aerators and other mechanical equipment.

The final treated water can be used for horticulture purposes or discharged into surface water bodies.

Fermentation is a natural process in which facultative microorganisms transform complex organic matter into water soluble & soil soluble compounds. It yields a relatively small amount of energy compared with aerobic decomposition

Fermentative Anaerobic Baffle Reactor (FABR)

Biological Treatment of Waste

- Simple Bacterial Cells decompose the organic matter
- Due to bacterial metabolism complex matter is transformed into cellular mass
- Enzymes act to break organic matter into water soluble and soil soluble nutrients
- ATP produced by our special strains of bacteria is the universal store house of energy. ATP provides the bacteria with energy for continuous growth and reproduction



Fermentative Anaerobic Baffle Reactor (FABR)

Benefits offered by our technology-

- Not dependant upon electricity.
- Very little labor required.
- No technical person required for operation.
- Minimal maintenance.
- Almost zero sludge handling.
- Minimal moving parts.
- Absolutely eco friendly.
- No foul odor.
- Can be built totally underground. (Utilize the space as a car park, lawn etc)
- Gravity based system.
- Reduces build-up of Pathogens
- Treated water can be reused for horticulture purposes

Sewage Treatment Snapshots



Sludge deposits in sewage



3 weeks after inoculation of OS1



5 weeks after inoculation of OS1



8 weeks after inoculation of OS1

Project Details

- 45 MLD Plant

Before

- Heavy Sludge deposits
- Electricity bill worth Rs. 1.5 CRORES per year
- Strong Foul Odor

After

- Total Treatment Cost of Rs. 80 LACS
- Saving of 40%
- Minimal Sludge
- No foul odor
- No pests, mosquitoes etc

Sewage Treatment Snapshots



Treated water being used in campus



Bacteria dosing in the manhole



Aerators being turned off



Treated water quality

Project Details

- 2 MLD Plant

Before

- Irregular Treatment
- Heavy Sludge deposits
- Electricity bill worth Rs. 25 LACS per year
- Strong Foul Odor

After

- Total Treatment Cost of Rs. 8 LACS
- Saving of approx 70% (aerators have been switched off)
- Minimal Sludge
- No foul odor
- No pests, mosquitoes etc

Sewage Treatment Snapshots



Sewage Treatment Plant 1



Sewage Treatment Plant 2



Treated water (L), Untreated water (R)



Treated water being used in golf course

Project Details

- 2 plants of 0.5 MLD flow each
- CPWD project
- Achieving BOD of less than 20 mg/l
- Minimal sludge
- Gravity based outlet making it extremely cost effective
- No foul odor

Sewage Treatment Snapshots



Sewage Treatment Plant



Gravel Plant Filter



Treated water



Treated water being used in lawns

Project Details

- Flow of 300 KL
- One of India's leading private university
- Achieving BOD of less than 30 mg/l
- Minimal sludge
- Gravel filter makes it visually appealing
- No foul odor

A green leaf is shown at the top, with a single drop of water falling from its tip. The drop is captured mid-air, just above a pool of water. The impact of the drop has created a series of concentric ripples that spread outwards from the center. The background is a soft, light green gradient.

Aerobic Sewage Treatment

OS1 *dms* in Aerobic Sewage Treatment

Role of OS1 in aerobic treatment plants

OS1 microbes are facultative in nature and can be applied to aerobic technologies as well.

By inoculating these microbes it is possible to reduce aeration time and save on electricity costs

Most pathogens that are present in the sewage are not able to survive the low pH of OS1. OS1 microbes multiply quickly under aeration and start decomposing organic matter

OS1 microbes is multi-cultured solution. After decomposition of organic matter the bacterial culture enters an autolysis mode and starts to consume its own dead cells, thereby reducing and maintaining the sludge volume

Benefits offered in Aerobic Treatment

- Reduction in sludge production
- Reduction in aeration time
- Reduction in release of foul odor
- Faster start up time
- Enhances capacity of STP by 25%
- Reduces build up of pathogens
- Treated water can be used for horticulture

Aerobic Sewage treatment snapshots



Treated water tanks and Carbon Filter



Bacteria being dosed



Oxidation Pond

Aerobic plant snapshots



Aerators



Bacteria tanks



Chemical Reaction Tanks



Activated Carbon Filters

Effluent Treatment Plants



Kitchen ETP



Laundry ETP



Lab ETP

A green leaf is positioned at the top of the frame, with a single water droplet falling from its tip. The droplet is captured mid-air, just above a pool of water. Upon impact, the water surface is disturbed, creating a series of concentric ripples that spread outwards. The background is a plain, light color, making the green of the leaf and the blue of the water stand out.

Solid Waste Treatment

Solid Waste Treatment using OS1

- Solid Waste in India has low calorific value and very high moisture content. This is the reason why technologies like pelletization yield very low efficiencies.
- The Organic Solutions composting technique ensures decomposition of solid waste without the menaces of foul odor and pests.
- Organic Garbage/waste can be treated and decomposed into excellent quality compost in 35 to 40 days. Projects can be as small scale - on a household level or large scale projects of composting municipal city waste.
- OS1 microbes are based on fermentation technology which reduces the pH of the waste. Pests like mosquitoes, flies and crows do not find fermented garbage appetizing and thus stay away from the landfill site.
- OS1 promotes low temperature fermentation and therefore waste odors, oxidizing agents and other unfriendly substances are not produced.
- OS1 microbes do not allow pathogenic organisms to survive thereby making the end product- compost extremely safe to use.

Benefits Offered by our technology

Anaerobic Solid Waste Treatment

- Anaerobic decomposition - No turning required.
- Reduction in volume of bio-mass
- Reduction in emission of gasses
- Reduction in Foul Odor
- Shorter Composting time
- Reduces BOD, COD levels of leachate water
- Helps break down minerals.
- Reduction in flies and mosquitoes
- Higher Nitrogen & Phosphorous values
- Lower energy losses due to fermentation

Aerobic Solid Waste Treatment

- Reduction in number of turnings required
- Reduction in composting time by about 25-30%
- Reduction in Foul Odor
- Reduction in flies, Mosquitoes, crows and other pests.

Sanitization

- Reduction in Foul Odor
- Reduction in flies, Mosquitoes, crows and other pests.
- Improved conditions for rag pickers, municipal staff and neighboring residential areas

Typical composting process using OS1 *dms*



OS1 being sprayed on garbage



Heaps left to decompose



Compost spread to dry



Compost being screened



Ready compost



Compost being packed

Composting using OS1 *dms* at MCD site



Garbage being dumped by MCD trucks



Garbage Heaps



Bacteria being prepared for spray



Heaps left to decompose



Ready compost



Compost being packed

Sanitization of Landfill Site using OS1 *dms*



Bacteria Tanks



Using Fire Tank for spray



Before Spray



After Spray

A green leaf is positioned at the top of the frame, with a single water droplet falling from its tip. The droplet is captured mid-air, just above a pool of water. Upon impact, the water surface is disturbed, creating a series of concentric ripples that spread outwards. The background is a plain, light color, making the green of the leaf and the blue of the water stand out. The overall composition is clean and minimalist, emphasizing the natural process of water falling.

Foul Odor Removal

Odor Control

- Odor control can be achieved in two different ways:
 - 1) Masking
 - 2) Neutralization
- Masking is what we see in air fresheners. A pleasant smell is introduced in very high concentrations to mask the unpleasant smell. We then detect only the pleasant smell. The problem to this approach is that the bad smell is not removed but stays in the background and resurfaces once the effects of the pleasant smell reduce.
- Neutralization is the process that nullifies the odour-producing process by synthesizing the bacteria responsible for producing the smell. The result is not just the elimination of the unpleasant smell but also the elimination of the pathogenic bacteria responsible for the malodor.

Foul Odor Removal by OS1 *dms*

- OS1 *dms* includes both aerobic and anaerobic species of microorganisms. These are harmless to human, animal, plant and marine life. The uniqueness of OS1 is that what we humans consider rotten and offensive is food for these microbes.
- OS1 bacterial solution does not allow putrefying microbes to multiply, and immediately reduces emission of foul odor producing gases. OS1 also aids in conversion of H_2S into carbohydrates, water and sulphur in the precipitated form. These carbohydrates are used as nutrients for the multiplication of OS1 microbes.
- **Benefits Offered at Landfills**
 - Reduction in flies, mosquitoes, crows and other pests
 - Improved living conditions for neighboring residential areas
- **Benefits offered in public toilets, urinals**
 - Instant reduction in foul odor
 - No urea deposits in pipes
 - Replacement to Naphthalene balls

A close-up photograph of a vibrant green leaf at the top, with a single drop of water falling from its tip. The drop is captured mid-air, just above a pool of water. Upon impact, the water surface is disturbed, creating a series of concentric, light blue ripples that spread outwards. The background is a plain, light color, making the green and blue elements stand out.

Bioremediation

Use of OS1 *dms* in existing plants

- Addition of OS1 in existing plants to enhance the capacity, improve results, control odor and yield cost benefits
- OS1 can be added to all kinds of plants; Activated Sludge Process, FAB, SAFF, UASB, Waste Stabilization Ponds, Lagoon Systems etc
- **Benefits Offered**
 - Reduction in foul odor
 - Reduction in BOD & COD levels
 - Reduction in sludge handling
 - Enhanced STP capacity



Use of OS1 *dms* in water bodies

Bioremediation and Phyto-remediation in lakes and drains

- Use of OS1 to degrade the environmental contaminants, reduce foul odor, control breeding of pests, reduce sludge etc. OS1 microbes are added to the water bodies on a daily basis.
- Phyto-remediation refers to the natural ability of certain plants called hyper accumulators to bio-accumulate, degrade or render harmless contaminants in soils, water or air. Certain Plants' molecules have the ability to break down complex organic pollutants into basic and simple molecules. The plant roots also provide housing for the beneficial microorganisms to further metabolize the organic compounds present in waste water.
- **Benefits Offered**
 - Reduction in foul odor
 - Reduction in sludge quantities
 - Reduction in mosquitoes, flies and other pests
 - No construction cost
 - On-site treatment
 - Beautification of site

Bioremediation Snapshots



SEWAGE INFLUX INTO THE LAKE



THICK MAT OF ALGAL SCUM ON WATER BODY

Project Details

- Microbial application for foul odor removal and treatment of organic matter

Bioremediation Snapshots



Project Details

- Microbial application for foul odor removal and treatment of organic matter

BACTERIAL CULTURE BEING SPRAYED TO REMOVE FOUL ODOUR & REDUCE THE ORGANIC MATTER



LAKE AFTER TREATMENT

A close-up photograph of a vibrant green leaf. A single, clear water droplet is captured mid-fall, just above a pool of water. The impact of the droplet has created a series of concentric ripples in the water below. The background is a soft, out-of-focus white, making the green and blue elements stand out.

Thank You