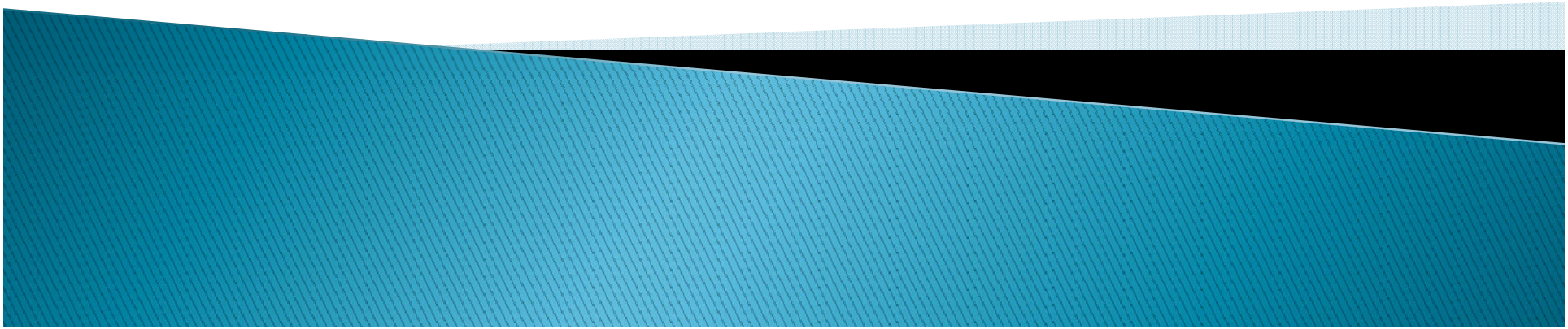
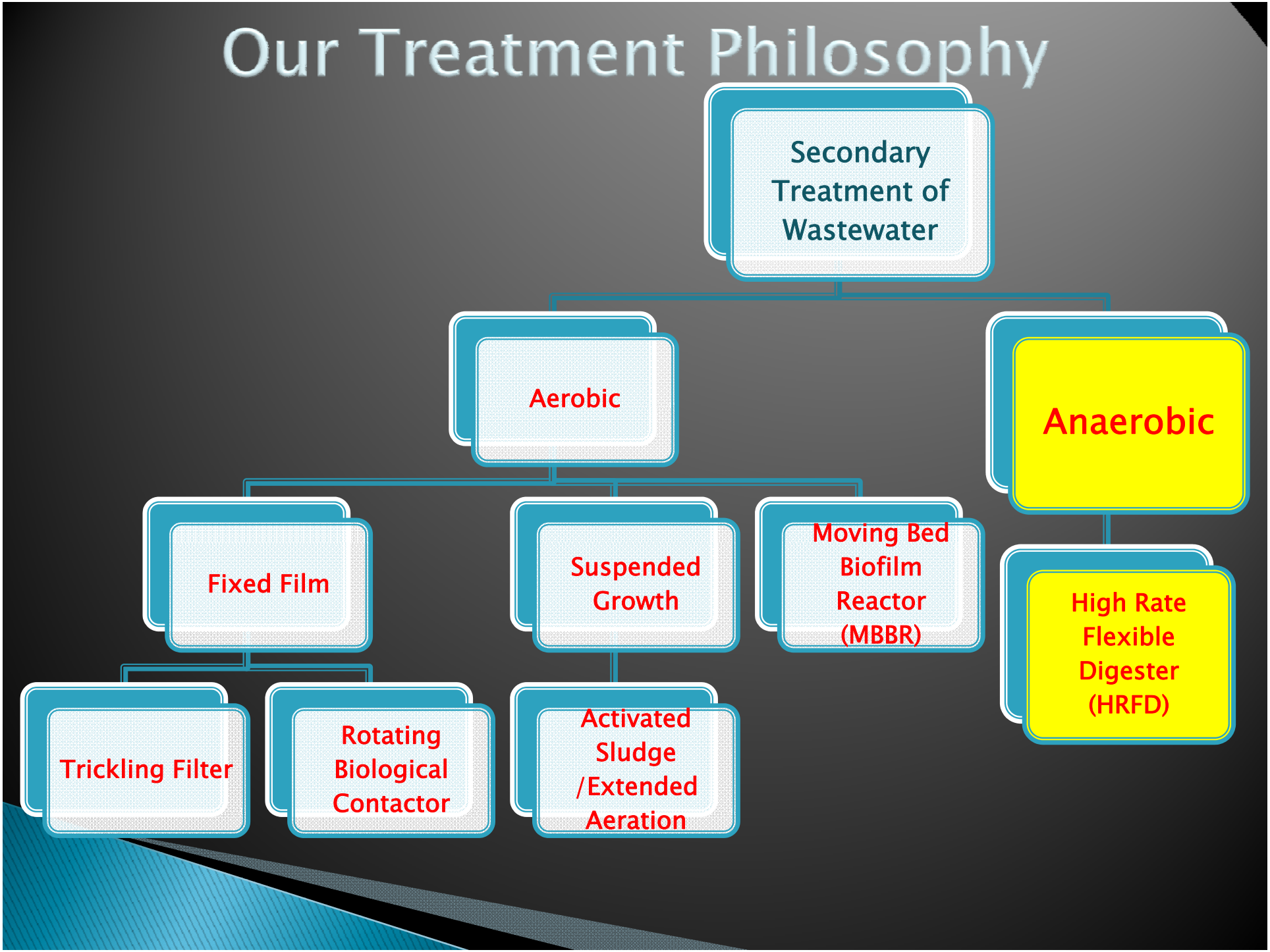
Energy and Resource Efficiency in Sustainable Wastewater Treatment

Sustainable Wastewater Treatment using different Aerobic & Anaerobic Treatment Technologies & Introduction to the Environmental Balance Improvement Device



We treat Water !!

Our Treatment Philosophy

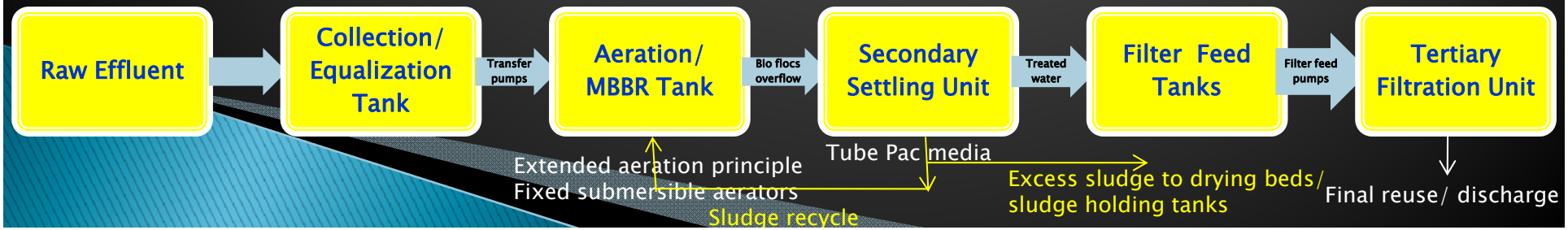


Our Packaged Skid Mounted STP

Extended Aeration/MBBR Based packaged skid mounted Sewage Treatment Plant											
Sl.No.	Plant Capacity (cum)	Area (sqm)	Thickness of plate along with FRP	Mechanical & Electrical Items along with skid mounted unit							
				Bar screen	Transfer pump	Aeration System	Sludge Pump	MBBR Media	Filter Feed Pump	Tertiary System	Electrical Panel & Cable
1	25	5.4 m (L) x 2.6 m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√
2	50	3.9m (L) x 3.15m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√
3	75	5.8 m (L) x 3.2 m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√
4	120	7.17m (L) x 3.37 m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√
5	150	9.8 m (L) x 3.5 m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√
6	200	12.5 m (L) x 3.5 m (W) x 3.1m (H)	(5mm+ 2mm)	√	√	√	√	√	√	√	√

Flow up to 250 m^3/d

- Using MBBR technology



Bioaugmentation by UWT– a revolution in wastewater treatment !!

- Utilizing specific microorganisms to carry out chemical transformations
- Applied in brewing, pharmaceutical & dairy industries
- Microorganisms constitute the 'workforce' in the treatment of municipal & industrial wastewater. They use the soluble organic matter in the waste stream as a food source. The bacteria consume the organic compounds and convert them into CO_2, H_2O and energy to produce new cells.
- CH_4, NH_3 & H_2S are also converted into simpler compounds so that there is no bad odor in the STP area.
- Thus, the soluble pollutants are converted into biomass which are removed mechanically from the waste stream & disposed.

Controlling parameters:

- ✓ DO levels
- ✓ pH
- ✓ Nutrients (N & P)

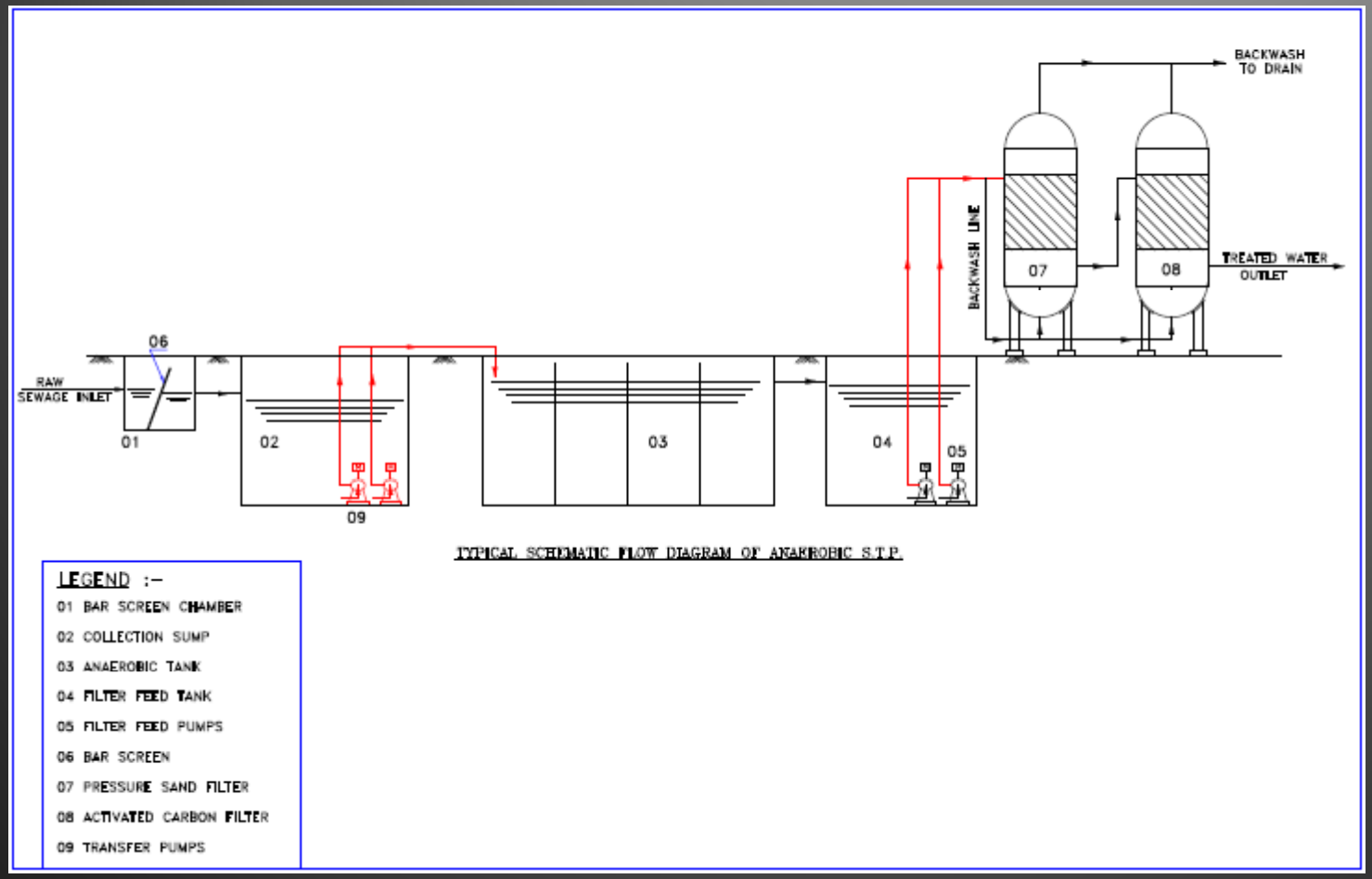
Benefits:

- Enhance BOD removal
- Improved Solids settling
- Preferential degradation of specific compounds
- Improved Nitrification
- Control in E. coli levels
- Odor reduction
- O & G removal

Applications:

- Pond & Lake water
- Hydrocarbon & Oil Spill
- Wastewater, Grease traps & Septic systems

HRFD Process



1. Bar Screening & Primary collection
2. Anaerobic treatment based on Anaerobic Sludge Blanket Process using High Rate Flexible Digester and special microorganisms dosing
3. Total treatment process and operation involve less usage of mechanical equipment, less manpower requirement and ease of operation
4. Treatment followed by filtration
5. Removal of BOD, COD, TSS, Bad Odor & E-Coli

Advantages of Anaerobic Treatment

- For the treatment of sewage generated from different sources like toilet, kitchen, canteen, office, etc.
- Use in residential, small scale commercial & hospitality sectors.
- In residential complexes- efficient treatment option for LIG, MIG & to some extent HIG.
- Handles flow up to 500 m^3/d.
- Units are constructed underground- so less space requirement.
- Mechanical equipments like blower & sludge handling units not required- hence much less power requirement.
- Max. power requirement – 15 HP

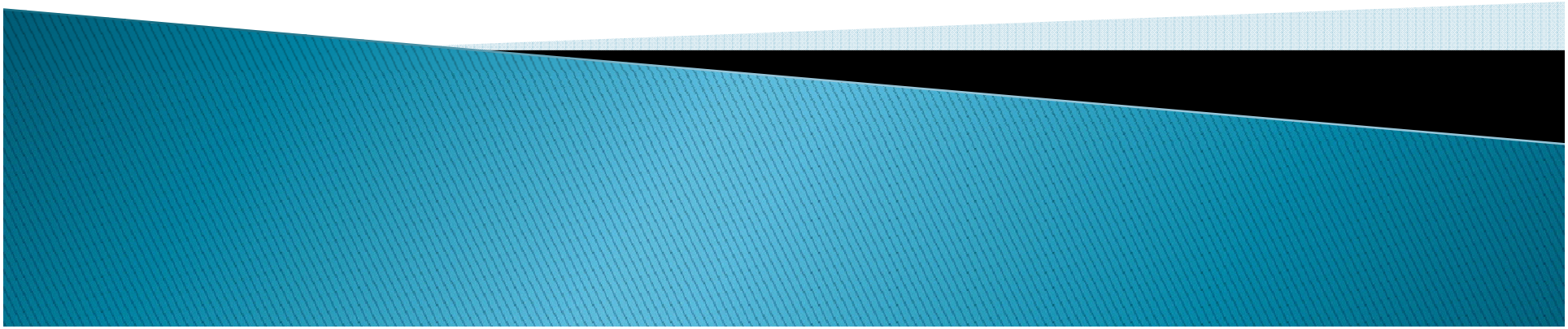
Some of Our Executed & Ongoing Anaerobic Projects

Sl. No.	Name of Customer	Capacity
1	West Wind, Ramgarh, Kolkata	300 KLD
2	Tolly Club, Kolkata	20 KLD (2 Nos.)
3	Bengal Park Chamber Housing Development.'Sunrise Greens', New Town, Kolkata	300 KLD
4	Bengal Park Chamber Housing Development.'Sunrise Junction', New Town, Kolkata	240 KLD
5	SKDJ Dream House (Parnasree Green), Kolkata	150 KLD
6	Fortune Township, Barasat	120 KLD
7	Bengal Shelter Housing Development Ltd., Madhyamgram, Kolkata	150 KLD
8	RDB Builders, Sonarpur, 24 Parganas (S)	120 KLD
9	Rotary Club, Piyali, 24 Parganas (S)	50 KLD
10	Eden Tolly, Kolkata	120 KLD
11	Sugam Park, Asansol	500 KLD
12	Merlin Uttara, Kolkata	200 KLD
13	Kaizen Hotels & Resorts, Durgapur	50 KLD
14	MPS, Jhargram	15 & 30 KLD
15	Mark Hotel, Gulshan Group, Sundarban	80 KLD

Treatment results at some of our sites

Client	Dt. of Sampling	Location	pH	TSS	COD	BOD	O & G
Parnashree Green	20.03.13	STP Inlet	7.14	58	95	52.5	6.5
		STP Outlet	7.05	19	60	11	4.8
	25.04.13	STP Inlet	7.54	40	81	52	5.2
		STP Outlet	6.85	< 5.0	31.5	4.5	< 1.0
Fortune Township	10.04.12	STP Inlet	7.58	38	105	62	4.2
		STP Outlet	7.19	9	57.7	7.6	< 1.0
Sunflower Garden	27.09.12	STP Inlet	7	140	222	123	8.2
		STP Outlet	7.22	88	128	28.4	1.5
Orbit City	05.12.12	STP Inlet	6.94	30	137	91.4	18.4
		STP Outlet	7.13	22	78	20.4	5.6

Introduction to Environmental Balance Improvement Device



Concept of Entropy

Entropy

It is the thermodynamic disorder when two systems at different temperatures or concentrations are mixed together. The system then tends to achieve a dynamic equilibrium and is said to be balanced

Fresh water

Brackish water

Sea water

Entropy・low

Diffusion of a molecule

Balance of concentration

Entropy・high

Entropy・low

Entropy・high

Temperature equalization

Diffusion of a hot molecule

LTM

HTM

Entropy・low

Mixing entropy state

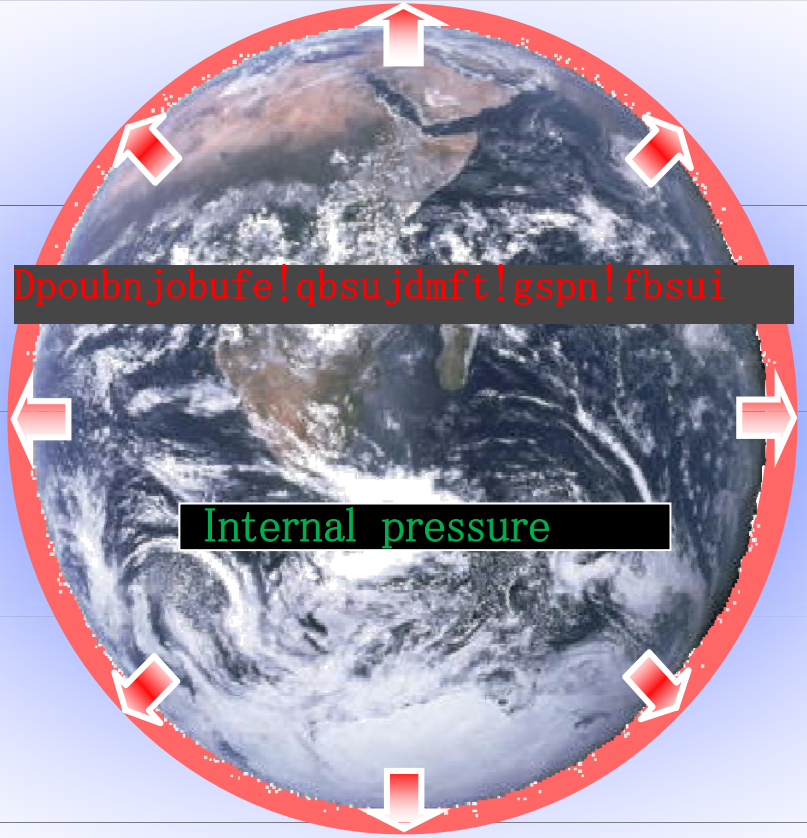
Entropy・low

Factors & the Occurrence of Imbalance

Entropy・low

Generating factor

Population expansion
Resources development
Deforestation
Site work
Ocean development
Urbanization
Mass production
Mass consumption
Deforestation
Environmental pollution
Abandonment of chemical substances
Frequent occurrences of war
Nuclear power plant disasters
Infectious diseases



Present conditions

Global warming
Ozone layer depletion
Acid rain
Abnormal weather
Water contamination
Natural disasters
Air pollution
Exhaustion of resources
Soil pollution
Desertification
CO_2 increase

Unbalance of the substances & Nature

O・H・N・OH・NO・Cl・CH－Radical

Unbalanced environment
Entropy・small

Generation of free radicals
Generation of active oxygen

Killing of microorganisms

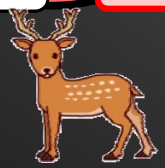
Collapse of the food chain
Collapse of the detritus food chain

Resource depletion





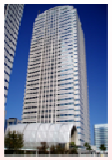




Detritus
Carnivore
Flora and fauna
An erosion
Bacteria・Fungi
Active oxygen

Rust・Silica
Chemical Sludge
Corrosion Oxidation
Exhaust Fume








Sewage Odors
Radical reaction
Anaerobic decomposition
Activated sludge
Incomplete combustion

Dpoubn jobufe! **particles**

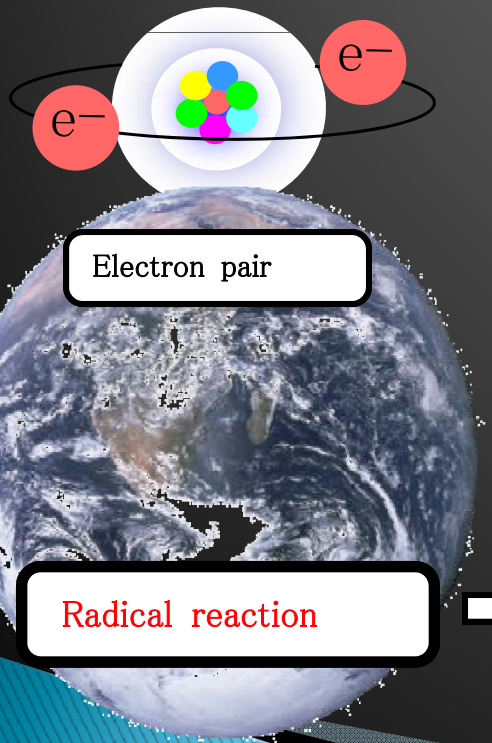
Volcano・Earthquake・Sewage・Sludge・Weed・Pest・Disease・Crop failure・algae ・Odors・Red tide

Atoms & radicals

Stability

Entropy・high

Outermost electrons



Electron pair

Cause of radical generation

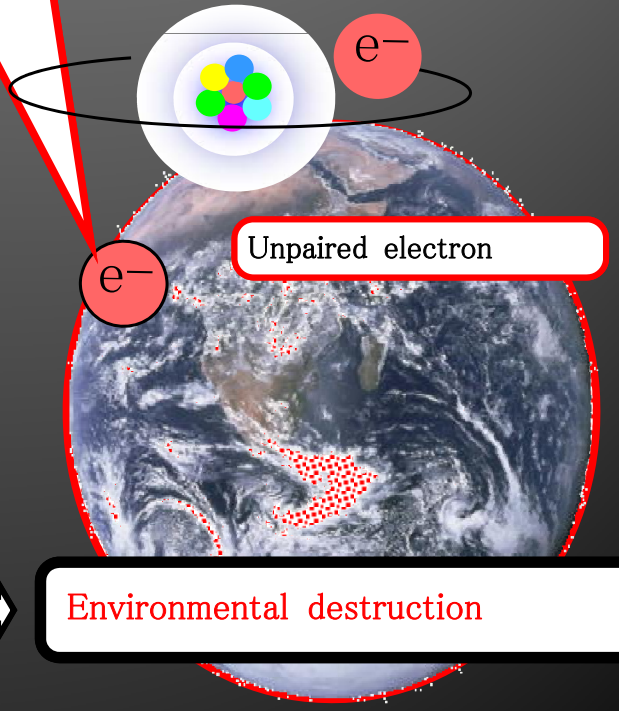
Electromagnetic waves
Electrical energy
High temperatures
Pesticides
Carcinogens
Herbicides
Insecticides
Radiation
Industrial waste
Ultraviolet rays
Animal Husbandry
Air pollution
Acid rain
Global warming
Drugs
Human sewage
Malnutrition
Tobacco
Crude oil pollution
Food additives

Internal pressure

Instability

Entropy・low

Radical atoms



Unpaired electron

Radical reaction → Radical chain reaction → Environmental destruction

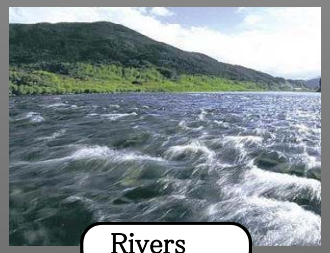
Nature & Uses of the Device

Transition Metal Powder + Plastic Molding

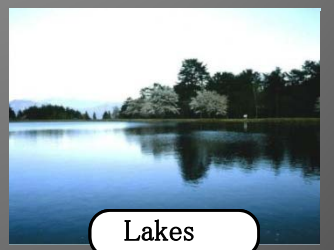
Areas of Application

- ＊Rivers
- ＊Lakes
- ＊Farms
- ＊Water supply facilities
- ＊Sewerage facilities
- ＊Wells
- ＊Mansions
- ＊High-rise building
- ＊Industrial wastewater
- ＊Hospital wastewater
- ＊Restaurant drainage
- ＊Septic tanks
- ＊Grease traps

- ＊Disappearance of blue-green algae
- ＊Decrease in eutrophication
- ＊Disappearance of sludge
- ＊Improvement of water quality
- ＊Antioxidant
- ＊Water softeners
- ＊Reduction action
- ＊Deterioration prevention
- ＊Wear prevention
- ＊Disappearance of sludge
- ＊Decomposition of inorganics
- ＊Disappearance of the bulking phenomenon
- ＊Water anti-corruption
- ＊Deodorant smells
- ＊Solubilization of garbage
- ＊Decomposition of heavy metals



Rivers



Lakes

Groundwater

Sewage treatment

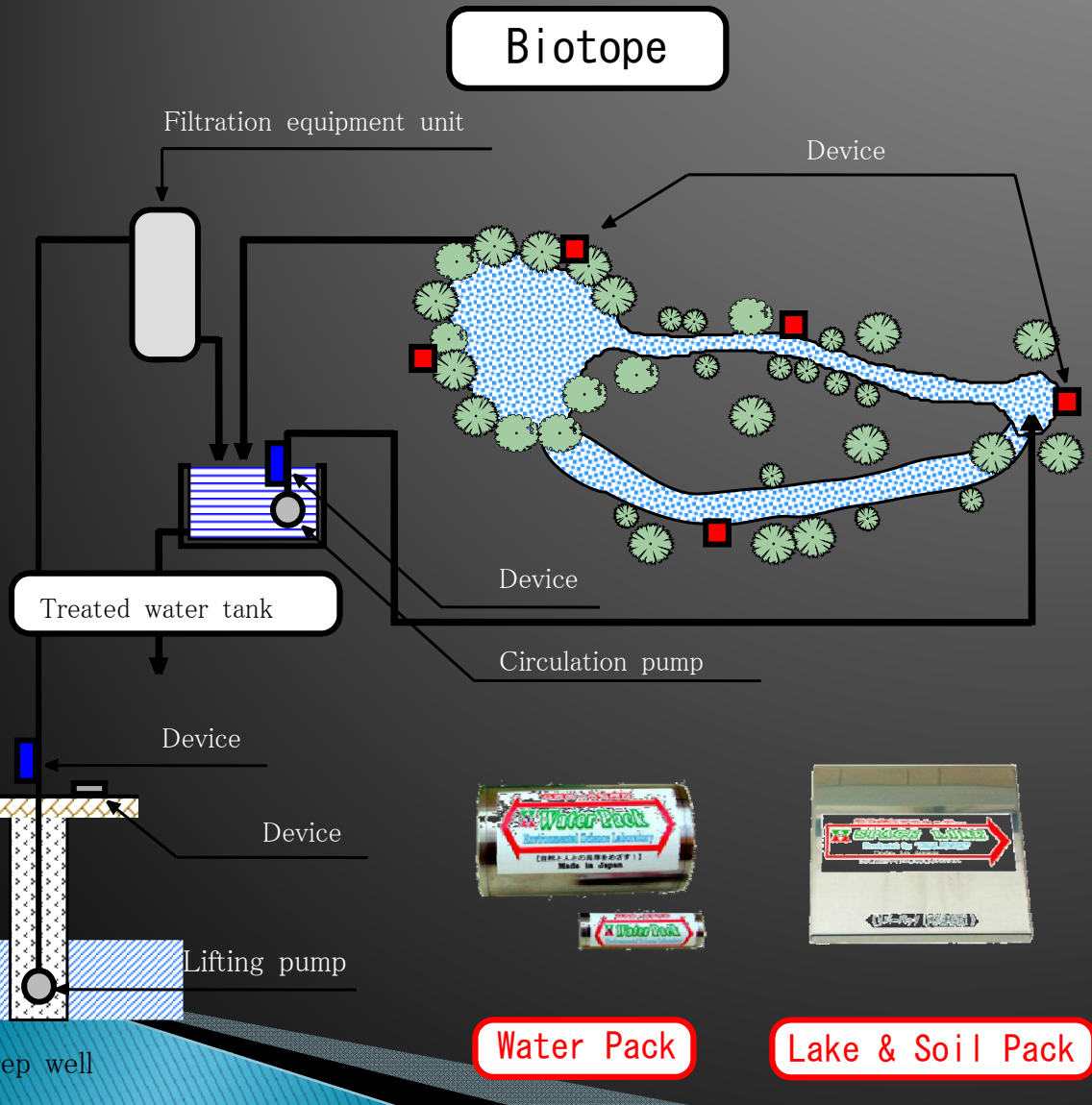
Septic tanks

Sludge

Eutrophication

Grease traps

Effects on lakes & ponds



■The effect of balance improvement■

1) Reduce blue-green algae in lakes
2) Disappearance of odors
3) Disappearance of sludge
5) Improvement of landscape
6) Improvement of living conditions
7) Improvement of water quality from water sources

Eco-Septic Tank

Grease Trap


3,700
Flusso
85 Liter
Flusso
15 Liter
Flusso
40 Liter
990
1,890
1,790

Thank You!!