

INNPT TECHNOLOGY



From Waste **TO** GREEN



INNPT TECHNOLOGY

An integrated solution for wastewater treatment



What is wastewater?

- 4 billion cubic meters /year
- Pathogenic bacteria.
- Organic load
- Heavy metals
- Phosphorus & nitrogen

Survival Times of Pathogens on Soils and Plants

SOIL

PLANTS

<u>PATHOGEN</u>	<u>ABSOLUTE MAXIMUM</u>	<u>COMMON MAXIMUM</u>	<u>ABSOLUTE MAXIMUM</u>	<u>COMMON MAXIMUM</u>
Bacteria	1 year	2 months	6 months	1 month
Viruses	6 months	3 months	2 months	1 month
Protozoa	10 days	2 days	5 days	2 days
Helminths	7 years	2 years	5 months	1 month

Hazardous heavy metals

Heavy metal	Toxicities
Arsenic	Skin manifestations, visceral cancers, vascular disease
Cadmium	Kidney damage, renal disorder, human carcinogen
Chromium	Headache, diarrhea, nausea, vomiting, carcinogenic
Copper	Liver damage, Wilson disease, insomnia
Nickel	Dermatitis, nausea, chronic asthma, coughing, human carcinogen
Zinc	Depression, lethargy, neurological signs and increased thirst
Lead	Damage the fetal brain, diseases of the kidneys, circulatory system, and nervous system
Mercury	Rheumatoid arthritis, and diseases of the kidneys, circulatory

NADIC Vision

We begin where
others Stand

NADIC Challenge



NADIC Challenge Achieved Via

Intensive R&D

- Lab Scale
- Pilot Plant
- Commercial Plant
INTECH Katamiah

Applied Research

- HBRC
- ARC
- NRC

Development And integrated solution.

- ECO-NADIC-HMR
- ECO-NADIC-3S
- ECO-NADIC-HAMDS
- Etc.....

What is INNPT ?

**Nano
particles**

**Alkaline
Additives**

**Chemical
precipitators**

INNPT

Knowledge

Unique know how in chemical treatment using Nano particle technology

Integration

easily integrate with most exiting treatment technology like primary , secondary , SBR

Process guarantees

effluent quality grade A for irrigation Reuse

ROI

Return on investment

CAPEX and OPEX
Reduction in initial investment and running cost (energy, man power,...etc.)

High through put
batch process without downtime

Application Fields

Domestic
Industrial

INNPT Products

INNPT -CPU

**ECO-
NADIC-
HMR**

**ECO-
NADIC-
3S**

INNPT At A Glance

- Capacity :-At least upgraded up to 8 times existing plant capacity
- Power consumption :- 95% reduction in power consumption
- Operation and maintenance :-75% reduction in work force required
- Effluent Quality :-Guaranteed Grade **A** irrigation water

What INNPT Products provide ?

- heavy metals & Acidic Dies removal
- COD,BOD and TSS removal
- Phosphorous , Nitrogen Removal
- Odor less process
- Treated water and Sludge pasteurization
- Generally the efficiency removal of all pollutants was reached between **90:99%**

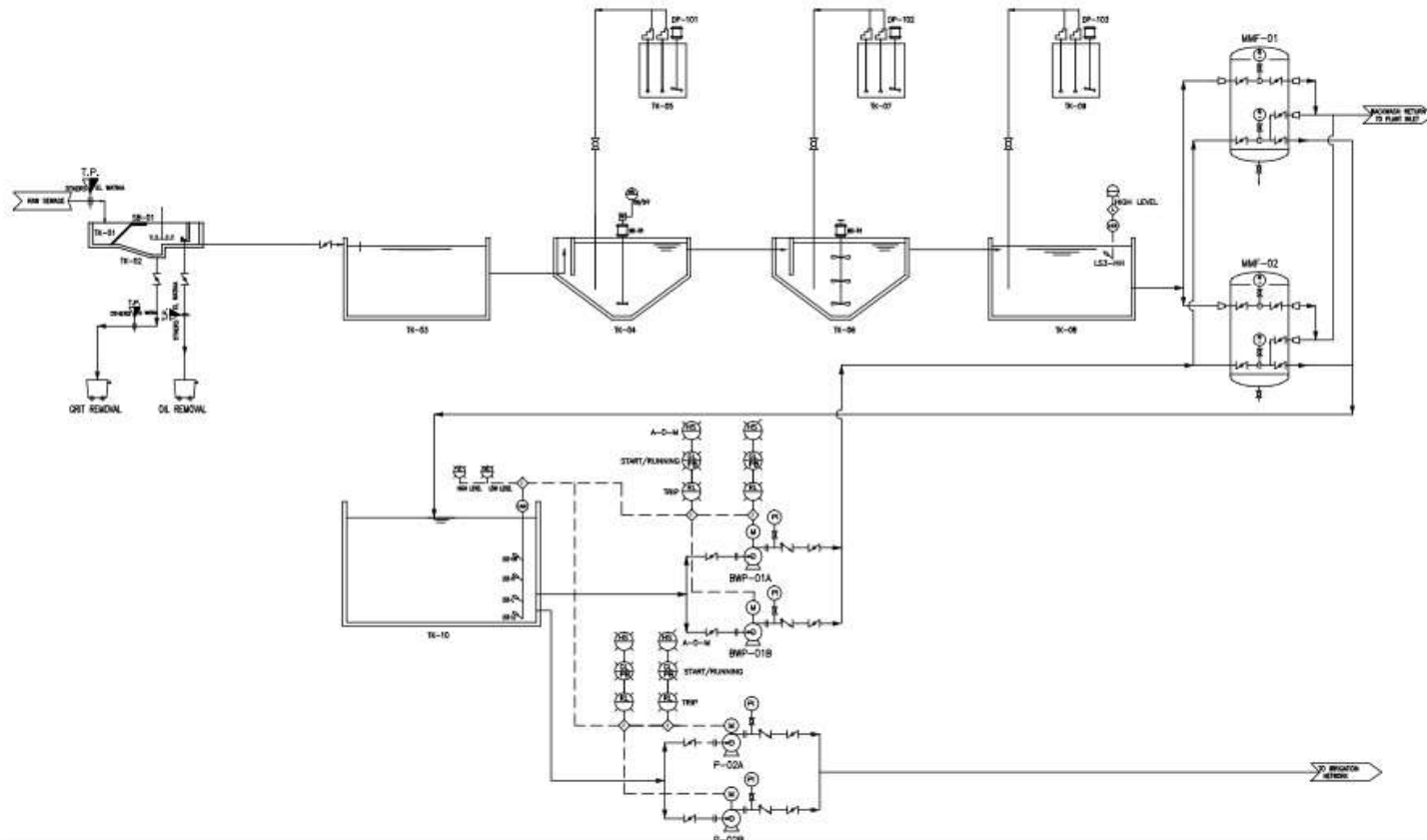
INNPT Products Benefits

- **Guarantee effluent Quality:-** We guarantee our plant Effluent Quality to comply with regulation laws
- **Ease of Operation:-** The plant controlled with a PLC device to manage the complete process plus alarm system in cases of fault detected.
- **Compact:-** The volume of treated wastewater can be **8** times more within the same WWTP
- **Stable:-** Plant not affected by presence of neither heavy metals ,nor PH value, nor acidic dies ,nor temperature .

INNPT products Benefits

- **Flexible:-**
- Treat a wide open range for TSS, COD, BOD , heavy metals, acidic dies , phenol and cyanide.
- **Sludge production:-**
Produced Sludge is **Stable**, **pasteurized** and free from pathogenic bacteria, with high content value of **NPK**, which makes it ready for beneficial use.
- Recovery of **phosphorous** and **Nitrogen** from treated wastewater into sludge for reuse.
- **Complete system supply:-**
- We offer complete system with chemicals, operation and maintenance

TK-01 INLET CHAMBER QTY: 1 NO. (DUTY) M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-02 GRIT & GREASE REMOVAL CHAMBER QTY: 1 NO. (DUTY) M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-03 BALANCING TANK QTY: 1 NO. M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-04 OXIDATION TANK QTY: 2 NO. M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-05 H2O2 DOSING SYSTEM QTY: 2 NO. M.D.C.: POLYETHYLENE WORKING VOLUME: --- L	TK-06 ACTIVATED HMR TANK QTY: 1 NO. M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-07 HMR DOSING SYSTEM QTY: 1 NO. M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-08 NEUTRALIZATION TANK QTY: 1 NO. M.D.C.: CONCRETE WORKING VOLUME: --- m ³	TK-09 H2SO4 DOSING SYSTEM QTY: 1 NO. CAPACITY: --- LITERS M.D.C.: POLYETHYLENE	TK-10 IRRIGATION TANK QTY: 1 NO. CAPACITY: --- m ³ M.D.C.: CONCRETE
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SYMBOL	DESCRIPTION
---	PROCESS LINE
---	AIR LINES
---	ELECTRICAL SIGNAL LINE
---	TERMINATION POINT
---	GRAB SCREEN
---	CENTRIFUGAL PUMP
---	CHEMICAL DOSING PUMP
---	AIR SLOWER
---	ELECTRIC MOTOR
---	BUTTERFLY VALVE
---	CHECK VALVE
---	INJECTION VALVE
---	GATE VALVE
---	TRAP DRAWN
---	MOTORIZED VALVE
---	REDUCER
---	FIELD MOUNTED INSTRUMENT
---	PANEL MOUNTED INSTRUMENT
---	ILLUMINATED PUSH BUTTON
---	X : G= GREEN, R= RED, Y= YELLOW
---	INDICATING LAMP
---	SELECTOR SWITCH - PANEL MOUNTED
---	PUSH BUTTON - PANEL MOUNTED
---	LOGIC INTERLOCK
---	INTERLOCK
---	TIME DELAY (THRU PLC TIMER), INSIDE PANEL
---	PRESSURE INDICATOR
---	LSHH LEVEL SWITCH HIGH HIGH
---	LSH LEVEL SWITCH HIGH
---	LSL LEVEL SWITCH LOW
---	LSLL LEVEL SWITCH LOW LOW
---	PN PUSH BUTTON
---	HS HARD SWITCH
---	FE FLOW ELEMENT / SENSOR
---	FI FLOW INDICATOR
---	PI PRESSURE TRANSMITTER
---	PSL PRESSURE SWITCH LOW
---	PSH PRESSURE SWITCH HIGH
---	PDT DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
---	AS AIR SUPPLY

SB-01 MANUAL BAR SCREEN QTY: 1 NO. (DUTY) BAR WIDTH: 10 mm BAR SPACING: 15 mm BAR MAT.: CARBON STEEL BODY NO. OF BARS: --- BARS DIMENSIONS: --- L x --- W x --- H	AB-101A/B/C AIR BLOWERS QTY: 2 Nos. (1 DUTY/1 STANDBY) CAP.: --- m ³ /hr @ --- psi POWER: --- KW - 3PH/400 V/ 50 Hz	BWP-01A/B BACKWASH PUMPS QTY: 2 Nos. (1 DUTY/1 STANDBY) DUTY/STANDBY: --- m ³ /hr @ --- psi POWER: --- KW - 3PH - 400 V - 50 Hz	MMF-01/02 MULTI MEDIA FILTER QTY: 1 NO. DIAMETER: --- mm OPERATION: MANUAL M.D.C.: CARBON STEEL EPOXY LINED SERVICE FLOW: --- m ³ /h BACKWASH FLOW: --- m ³ /h	DP-101 H2O2 DOSING PUMP QTY: 1 No. (1 DUTY/STANDBY) CAP.: --- L/H @ 4 BAR VOLTAGE: --- V, --- PH	DP-102 HMR DOSING PUMP QTY: 1 No. (1 DUTY/STANDBY) CAP.: --- L/H @ 4 BAR VOLTAGE: --- V, --- PH	DP-103 H2SO4 DOSING PUMP QTY: 1 No. (1 DUTY/STANDBY) CAP.: --- L/H @ 4 BAR VOLTAGE: --- V, --- PH
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REV	DATE	BY	DESCRIPTION	DATE	CHKD	APPRD

NATIONAL COMPANY FOR DEVELOPMENT
INVESTMENT AND TRADE

TELEPHONE : (202) 22748099
FAX : (202) 22748099

الهيئة العامة للغذاء والدواء
NRDC

DRAWING TITLE : PIPING & INSTRUMENTATION DIAGRAM					
PROJECT : _____					
CLIENT : _____					
SCALE : N.T.S.	DATE : _____	DESIGN : _____	ENGINEER : _____	PROJECT : _____	APPROVED BY : _____
DRAWING NO. : _____		SHEET NO. : 1 OF 1		REV. : _____	





Where to Apply ? For wastewater

- Domestic Wastewater
 - New WWTP
 - Plant Expansion
 - Capacity 8 times more
 - Quality
 - Tertiary Equivalent
 - Pathogenic reduction
 - HM & Acidic dies removal
- Reuse in irrigation

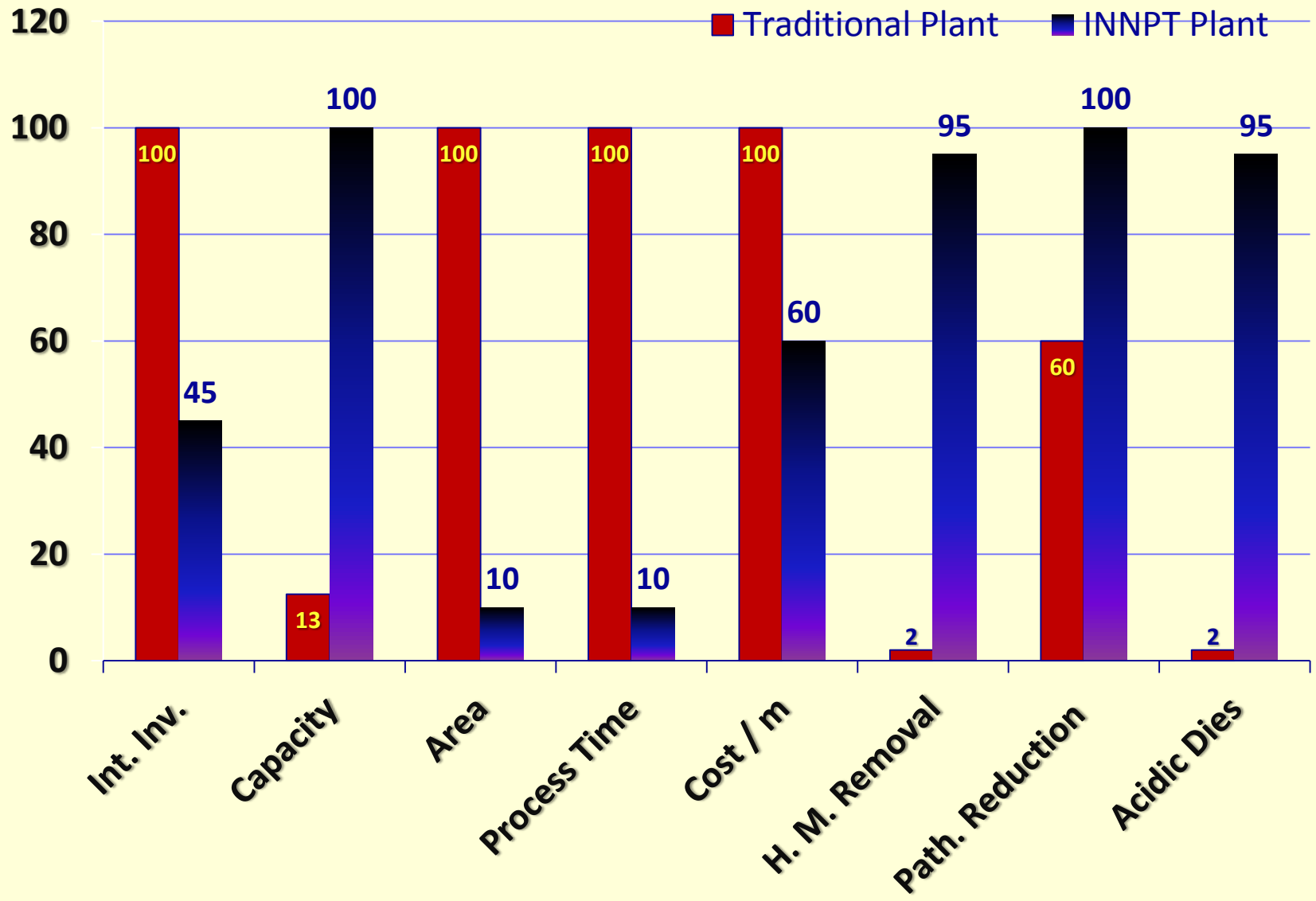
Where to Apply ? For wastewater

- Industrial Wastewater
 - Textile processing
 - Food processing
 - Tanners
 - Pulp & Paper
 - Sugar mill
 - Metal refineries

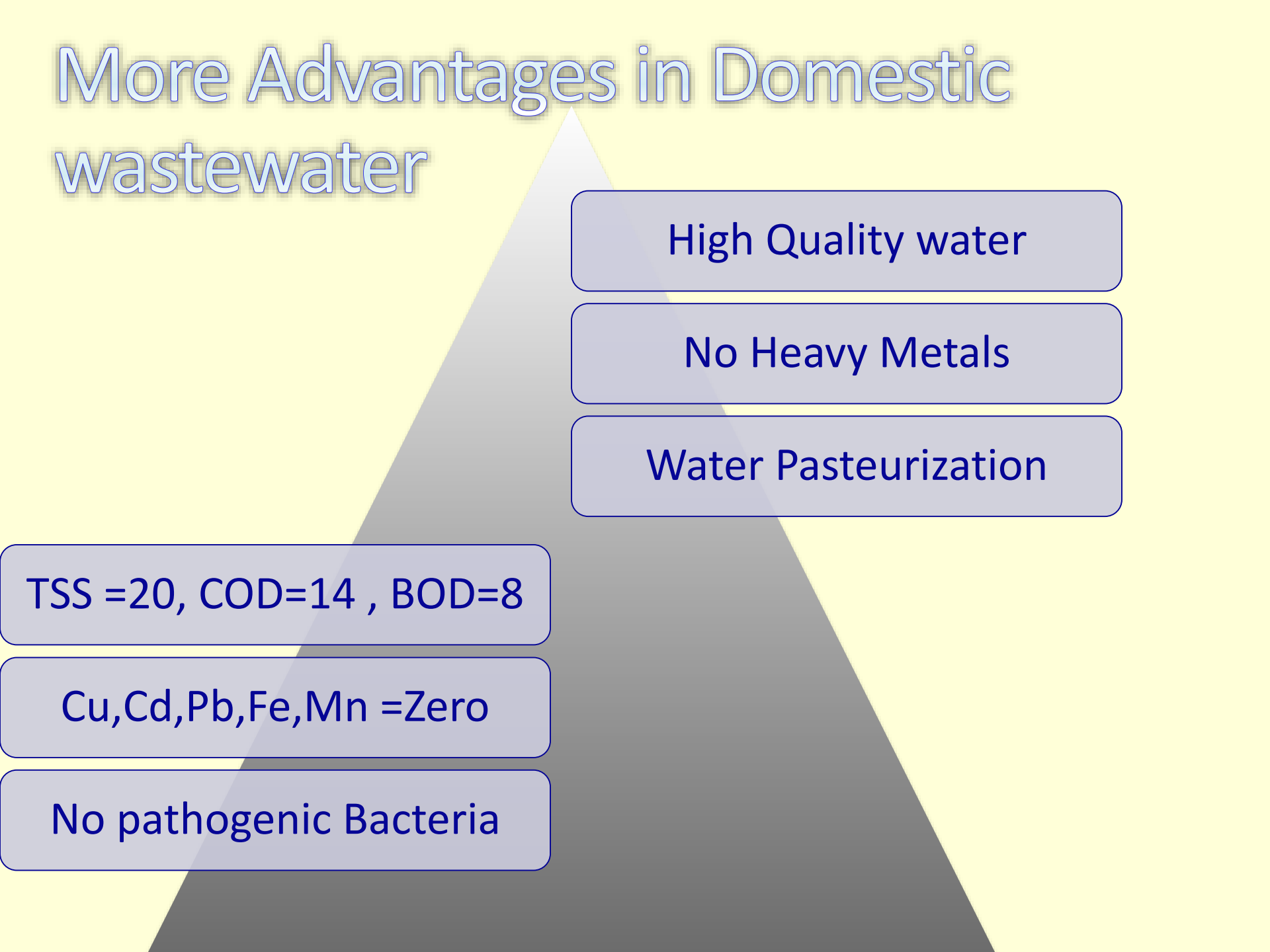
Where to Apply ? For Sludge

- As Thickener
- As Dewatering system
 - Instead of Polymer
 - Instead of Mech. Dewatering
 - Instead of Drying bed

Comp. Bet. INNPT . and Others In domestic wastewater



More Advantages in Domestic wastewater



High Quality water

No Heavy Metals

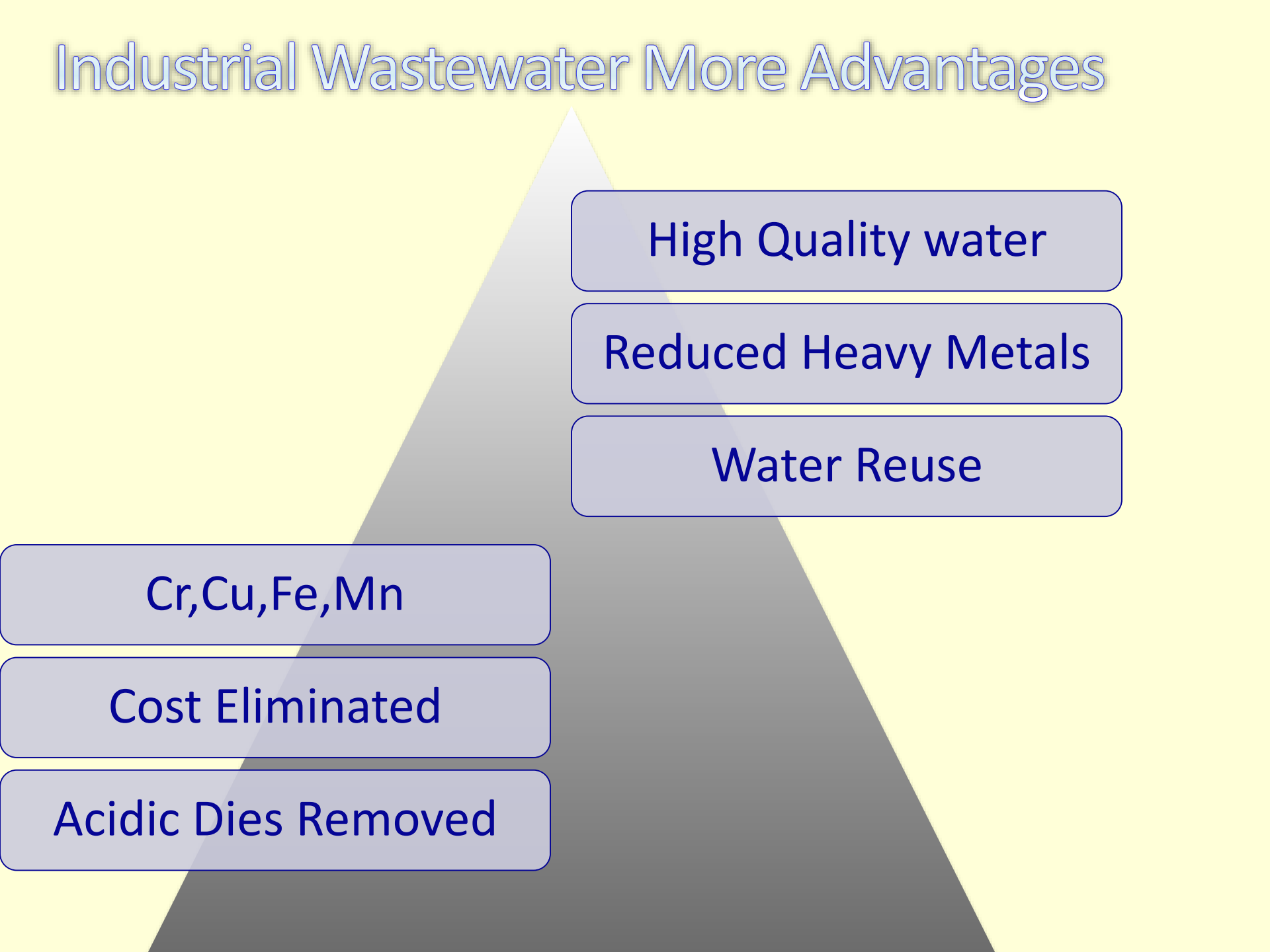
Water Pasteurization

TSS =20, COD=14 , BOD=8

Cu,Cd,Pb,Fe,Mn =Zero

No pathogenic Bacteria

Industrial Wastewater More Advantages



High Quality water

Reduced Heavy Metals

Water Reuse

Cr,Cu,Fe,Mn

Cost Eliminated

Acidic Dies Removed

Lab Test Results in Balaqs WWTP

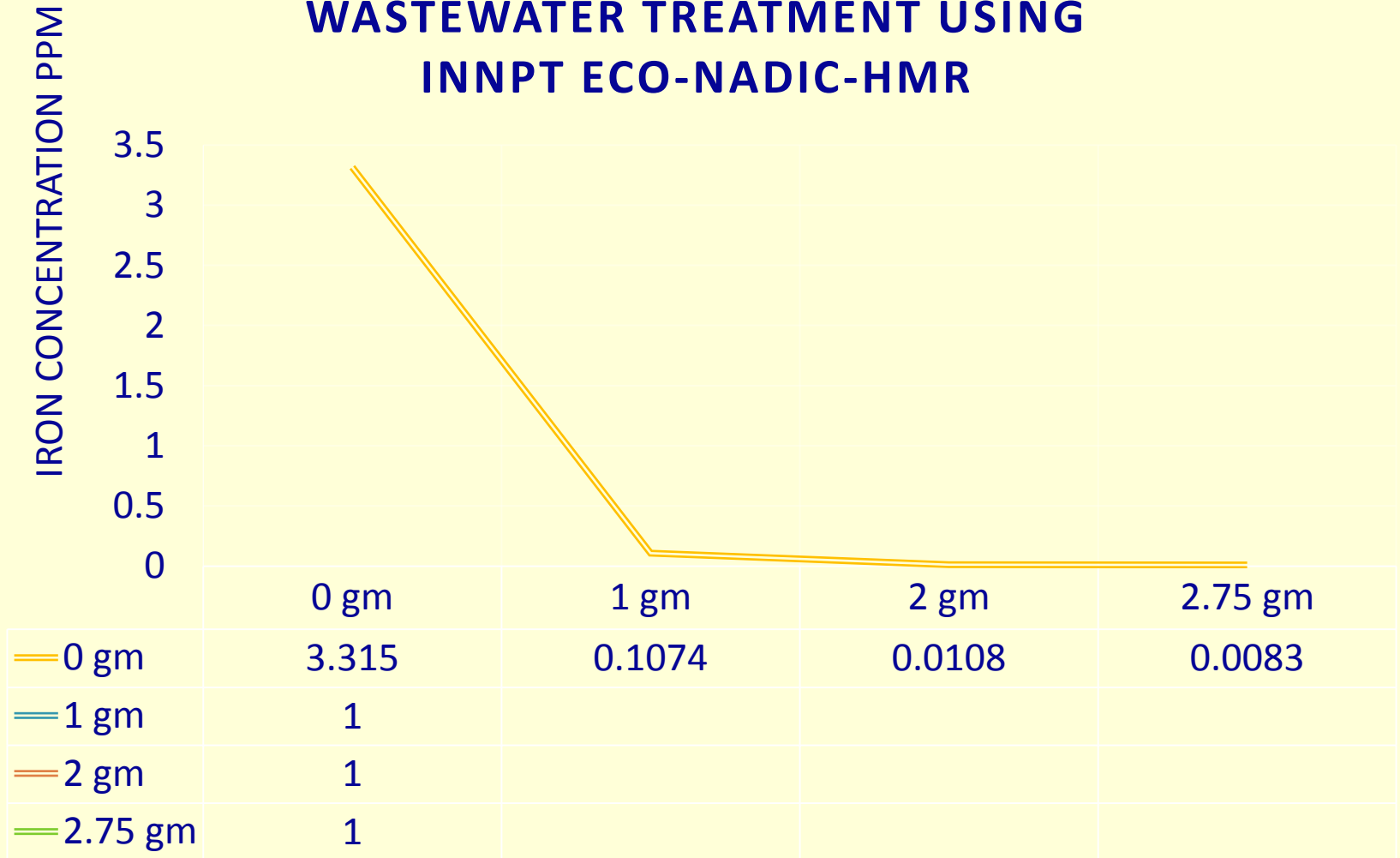
Test	Raw waste	Chemical treatment (Dose)					Normal range
		0.5 g	1 g	1.5 g	2 g	2.75 g	
Settling test(ml/l)	1.8	4.5	18	24	28	29	
TSS (mg/l)	215	63	31	24	16	12	50
BOD(mg/l)	190	146	92	67	14		60

Lab Test Results in Balaqs WWTP

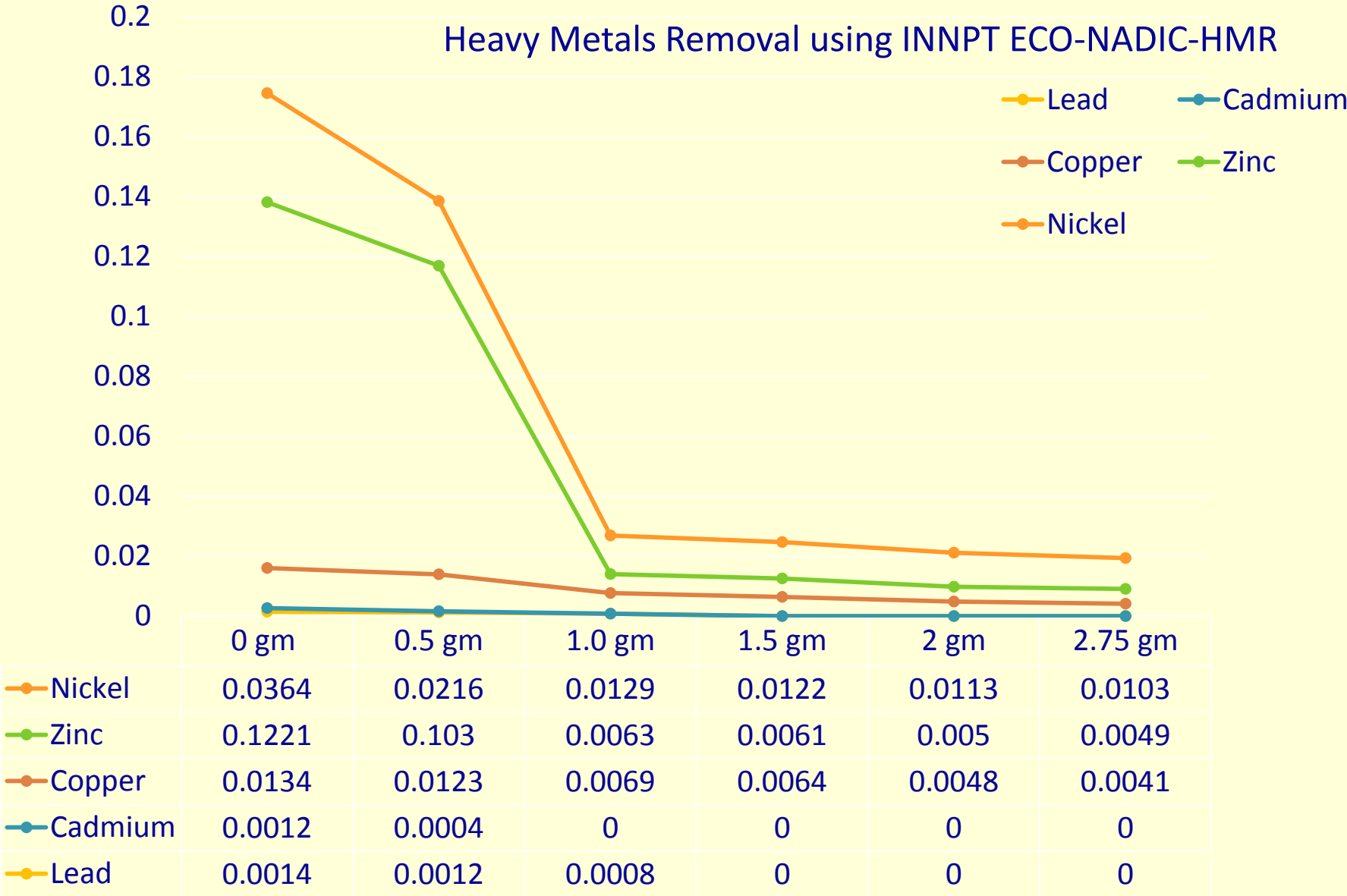
Test	Raw waste water	Chemical treatment (Dose)					Normal range
		0.5 g	1 g	1.5 g	2 g	2.75 g	
TSS ppm	200	22	10	8	18	12	50

Lab Test Results in Balaqs WWTP

WASTEWATER TREATMENT USING INNPT ECO-NADIC-HMR



Lab Test Results in Balaqs WWTP



NRC lab analysis results for INTECH tank treated wastewater - in 27 August 2014

Parameter	Raw Wastewater Value From Plant Lab	Treated wastewater with HMR value	Eff. %
PH	7.3	7.55	
TSS mg/l	358	18.3	94.9
COD mg/l	956	76	92
BOD mg/l	534	30	94.3
Total Nitrogen	85	26.4	69
TP	15	0	100

Microbial lab analysis for INTECH treated wastewater in HBRC

Test	(Dose) 2 g	Unit	Normal range
Fecal coliform	1.8×10^2	MPN/100 ml	1000<
Salmonella and shigella	Nil	colonies per gram	1<
Nematode	Nil	CFU/100 ml	1<

H.M. Removal efficiency and Solubility

Test	Raw sludge		Treated sludge		% Reduction in Soluble metals	EPA normal range
	Soluble value mg/kg	Total value mg/kg	Soluble value mg/kg	Total value mg/kg		
Zinc(mg/kg)	434.6	501.5	184	387	57.6 %	2800
Iron (mg/kg)	399	9032	141	3983	64.6 %	
Manganese (mg/kg)	45.4	582	27.4	67.1	39.6 %	
Copper(mg/kg)	15.4	114.9	1.95	106.3	87.3 %	1500
Cadmium(mg/kg)	0.62	0.78	0.49	0.75	20.9 %	39
Cobalt(mg/kg)	0.64	6	0.11	5.35	82.8 %	
Chromium(mg/kg)	2.4	126.8	0.18	105.5	92.5 %	1200
Nickel(mg/kg)	6.1	31.9	1.5	31.9	75.4 %	420
Lead(mg/kg)	17.3	128.7	6.9	36.7	60.1 %	300
Arsenic (mg/kg)	1.64	18.5	1	10.5	39 %	41

Recovery of Phosphorus & nitrogen in sludge HBRC

Test	Raw Sludge(after settling)	Chemical treatment (Dose)		
		2 g	5 g	10 g
phosphorus (mg/kg)	170	300	600	1800
Total N (mg/kg)	2400	3100	3900	4300

Sludge Strategy in Egypt

- sludge management systems are
 - often inefficient
 - unsustainable
- mainly because
 - no single process or treatment is able by itself to address all above factors.

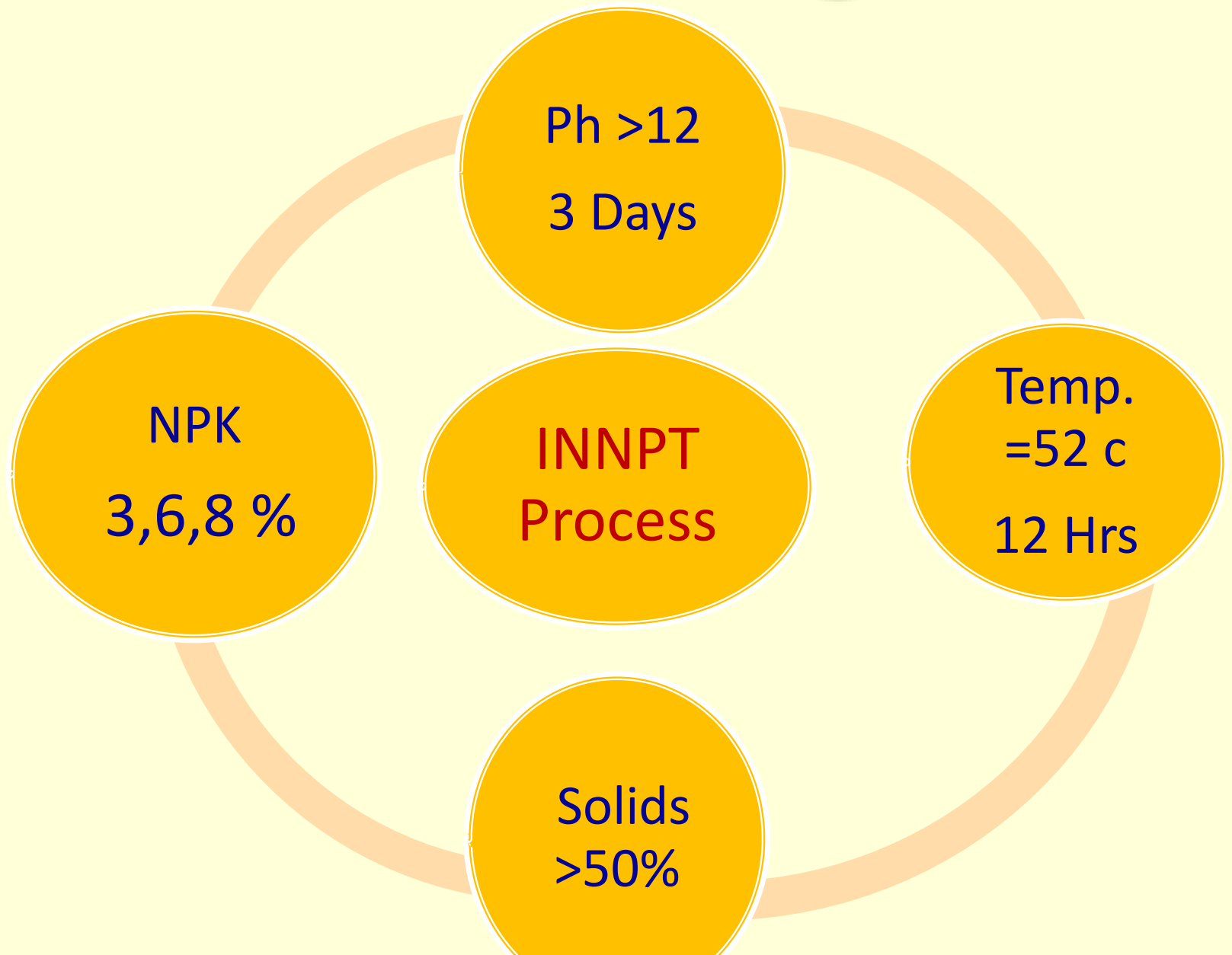
Sludge Strategy In Egypt

- The development of sustainable sludge management procedures requires two important factors:
- The assessment of management routes capable of
 - maximizing the recycle/recovery benefits
 - Through low energy impact systems;
- the development of innovative procedures and of operational systems appropriate to local circumstances, including economy, geography, climate

ECO NADIC 3S™

- Sludge Pasteurization and Total removal of Pathogenic bacteria.
- Heavy Metals Precipitation Increase existing plants efficiency and capacity
- Recover Nitrogen and Phosphorus in sludge
- Increase Potassium % in treated sludge
- Treat sludge to comply with EPA regulations and constraints for class A fertilizer
- Quick and efficient technology for sludge stabilization which
 - Save drying time to 3 minutes
 - Create class A fertilizer within 3 days
 - Save soil from heavy metals
 - Save soil from pathogenic bacteria

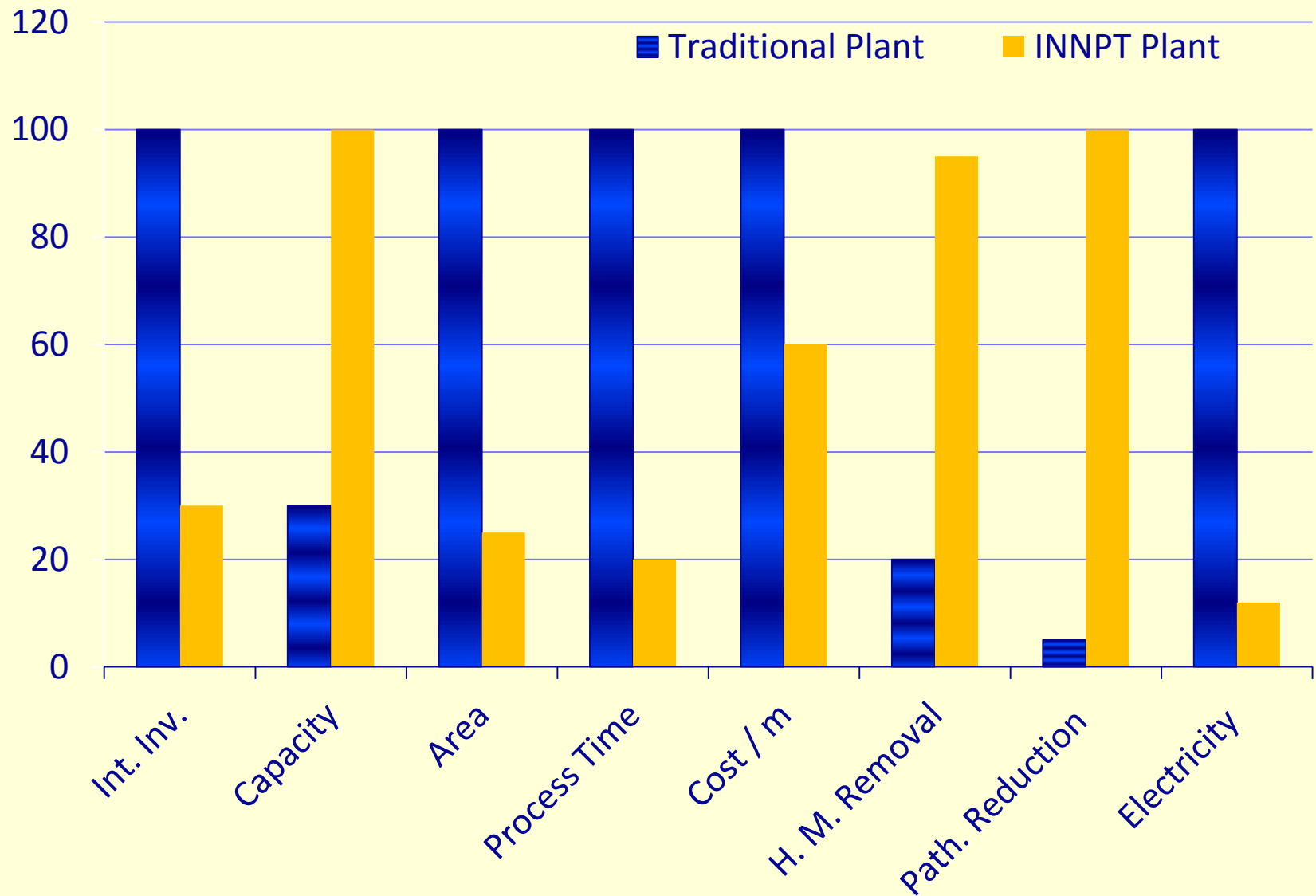
INNPT NPK soil & EPA regulations



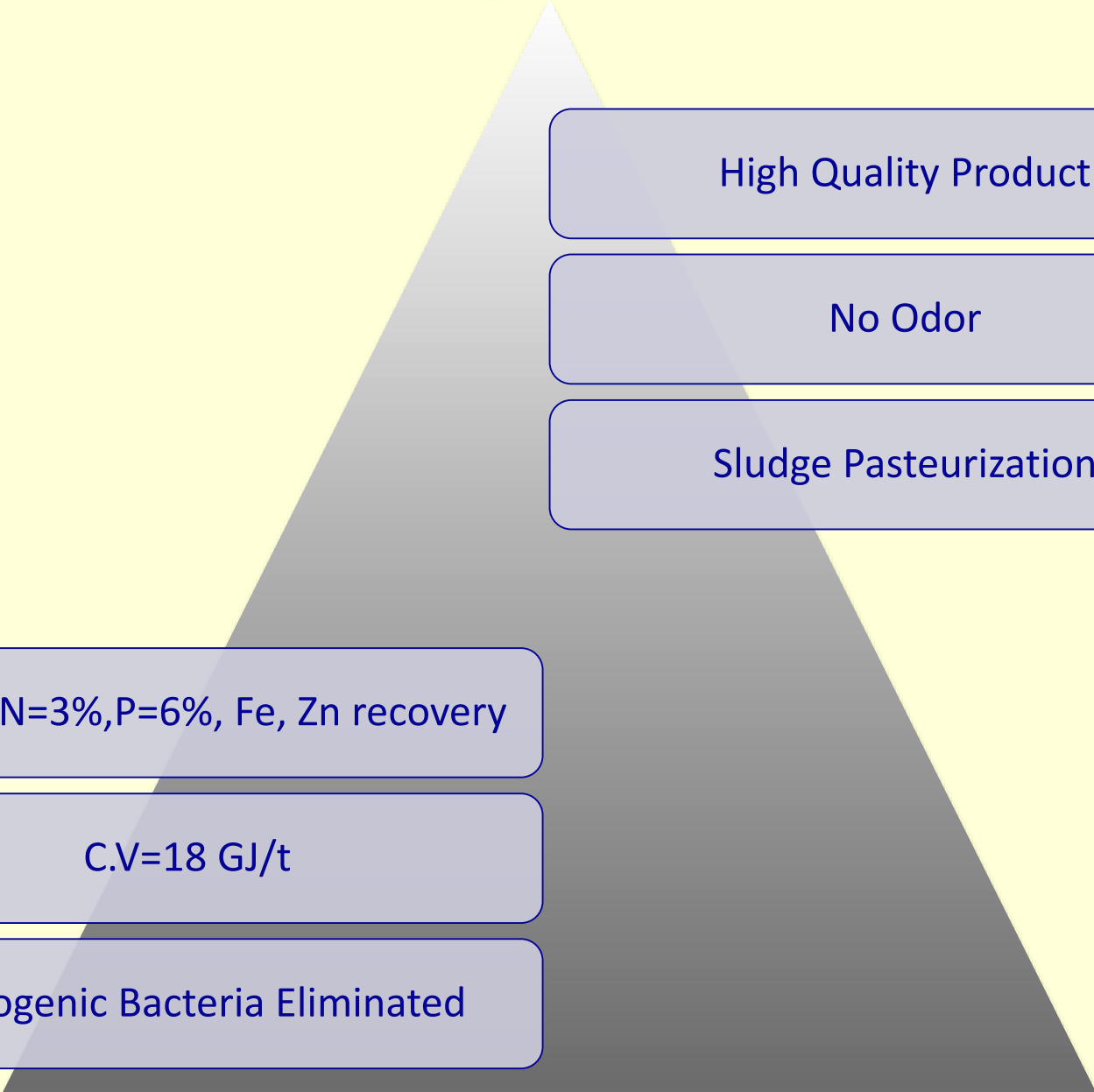
Accumulated Heavy Metals in Soil

Test	ECO-NADIC-NPK Soil (mg/kg)	Annual pollutant loading rate (kilograms per hectare per 365 day period)		Cumulative pollutant loading rate (kilograms per hectare) during 20 years		% of allowed over 20 years	% of allowed over 200 years
		ECO-NADIC-NPK Soil	EPA limits	ECO-NADIC-NPK Soil	EPA limits		
Zinc	387.5	0.009163	140	0.1832	2800	0.0065 %	0.065 %
Copper	106.3	0.0025	75	0.0506	1500	0.00337 %	0.0337 %
Cadmium	0.75	0.00001	1.9	0.0002	39	0.00056 %	0.0056 %
Nickel	31.9	0.0075	21	0.15	420	0.0357 %	0.357 %
Lead	36.7	0.0008	15	0.17	300	0.0566 %	0.566 %
Arsenic	10.5	0.00024	2	0.004	41	0.00975	0.0975 %

Comp. Bet. INNPT and Other Sludge Treatment and dewatering



More Advantages



High Quality Product

No Odor

Sludge Pasteurization

K=8% , N=3%,P=6%, Fe, Zn recovery

C.V=18 GJ/t

Pathogenic Bacteria Eliminated

Partners not competitors

- Dewatering system suppliers
- Decaners suppliers
- Solar dryers suppliers
- Fertilizer marketers

NADIC Portable Treatment Truck



NADIC Portable Treatment Truck

- 20 M³ Capacity Each
- 200 M³ Treated / day / Truck
- 3 Trucks serves 10,000 capita
- Produces 12 ton of fertilizer /month
- Each truck costs 250 le /day
- 1.5 LE Cost / capita /month

A side-profile photograph of a white Isuzu truck with a blue chassis. The truck is equipped with a large blue cylindrical tank mounted on its frame. At the rear of the tank, there is a white pump unit with various pipes and a yellow discharge hose. Japanese text is visible on the side of the white pump unit. The truck is parked on a paved surface in front of a building with a green wall and a grey corrugated metal section.

NADIC Portable Plant for Drainage Channel

- 10 Tons chemical tank
- Jet truck with 5 l/s discharge pump
- 7,500 M³ Per hour
- 60,000 M³ / day
- 2 KM / day with 10 m top width , 4 m depth and 5 m bottom
- Cost 10 LE / meter

Where to Co-operate

- New village WWTP
 - 4000 village not covered
- WWTP Expansion
 - Abu Rawash
 - Jabal Asfar
- WWTP quality improving
 - Abu Rawash
 - Jabal Asfar
- Open lakes and drainage canals
 - Al Rahawey
 - El Manzalah lake

Thank you!

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