



FSTP Experience - Technology, Monitoring and Funding

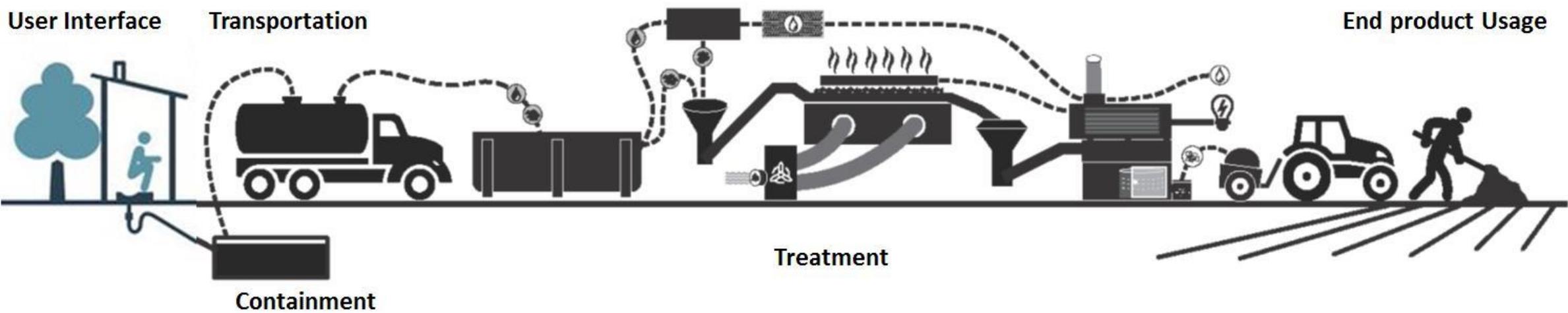
September 2019, Pune



Which would you prefer?

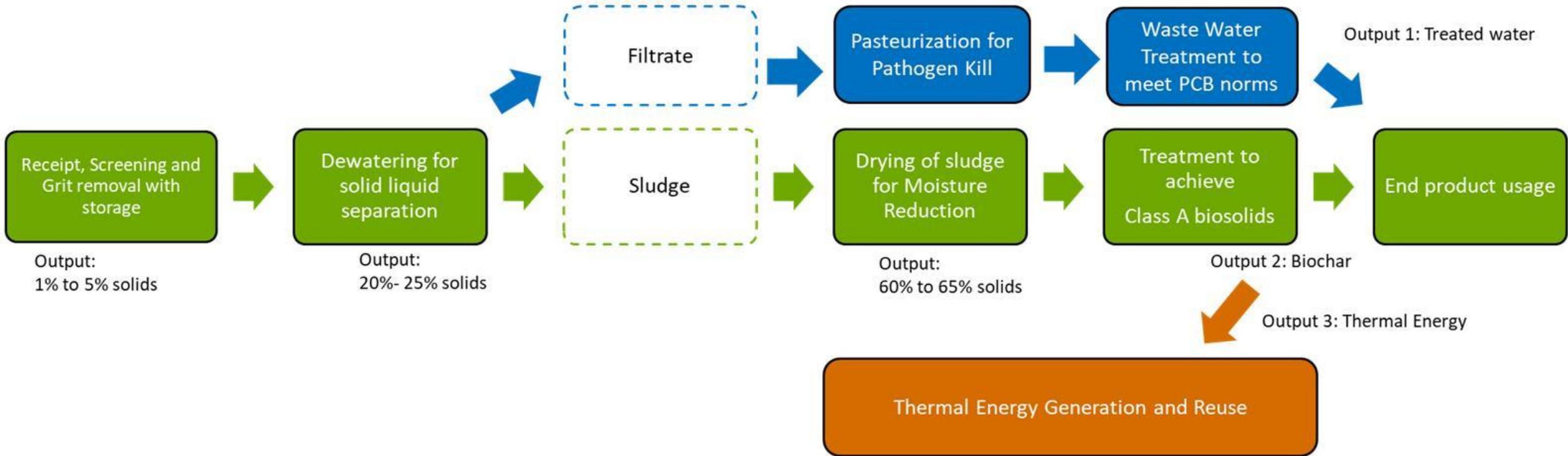


Non sewered sanitation value chain



TREATMENT PROCESS OVERVIEW

The Thermal Faecal Sludge and Septage treatment process goes through 6 stages:



RECEIPT OF SEPTAGE

- Currently the faecal sludge in the Septic Tanks are removed on demand when full. Scheduled desludging will ensure periodic emptying
- The primary sources for faecal sludge collection in the community are:
 - Community Toilets / Public Toilets
 - Households
 - Commercial Establishments
- The Sludge is removed using machinery which does not involve direct contact of people with the Sludge



SEPTAGE RECEIVING STATION - CONTRARIES AND GRIT REMOVAL

- A septage receiving station will receive the faecal sludge and septage on a daily basis.
- SRS capacity is 50 Cu.m/hr
- This contains a screening mechanism to remove floating and larger inorganic particles such as plastic, cloth, etc.
- Next the faecal sludge and septage is passed through a grit chamber for sand and stones removal and then onto a holding tank



SEPTAGE HOLDING SYSTEM

- Holding tanks with 2 days capacity is placed Above ground
- Each tank as capacity of 20KL
- Platform is fabricated on top of tanks for operational and maintenance ease.



DEWATERING

- Dewatering in its simplest definition is the removal of liquids from the septage.
- This process is used in Septage treatment where the solids is separated from liquids through a three step processes.
- The septage with added polymer is passed in a mixing chamber for the formation of flocs which subsequently passes through a volute press to separate flocs and water
- Dewatering unit aids to bring down the moisture level of septage from 95-98% to around 80%
- Dewatered solids are moved on for further treatment of sludge in the dryer
- Dewatered Filtrate is diverted to pasteurization and waste water treatment plant



DEWATERING VISUALS



PASTEURIZATION

- Pasteurization is the next step performed on the Filtrate collected. This removes all the pathogens and helminth eggs to make the filtrate biosafe
- The Pasteurizer comprises of a two heat exchangers with holding coil where the septage is heated to 85 degree Celsius for 30 sec for pathogen kill



WASTEWATER TREATMENT

- The dewatered water is sent to the Wastewater Treatment Unit and treated to the safety / regulatory standards applicable for reuse
- Wastewater treatment plant oxidizes the organic load converting them to safe outputs
- The following technologies are being used:
 - Phytotrid
 - MBBR



MECHANICAL SLUDGE DRYER

- The dewatered solids passes through a sludge dryer. The Dryer operates at a temperature of about 60-80 degree Celsius
- The Drying run is about 45 minutes
- The moisture content of the sludge at the end of the Drying cycle is about 30-35%



MECHANICAL SLUDGE DRYER VISUALS



PYROLYSIS

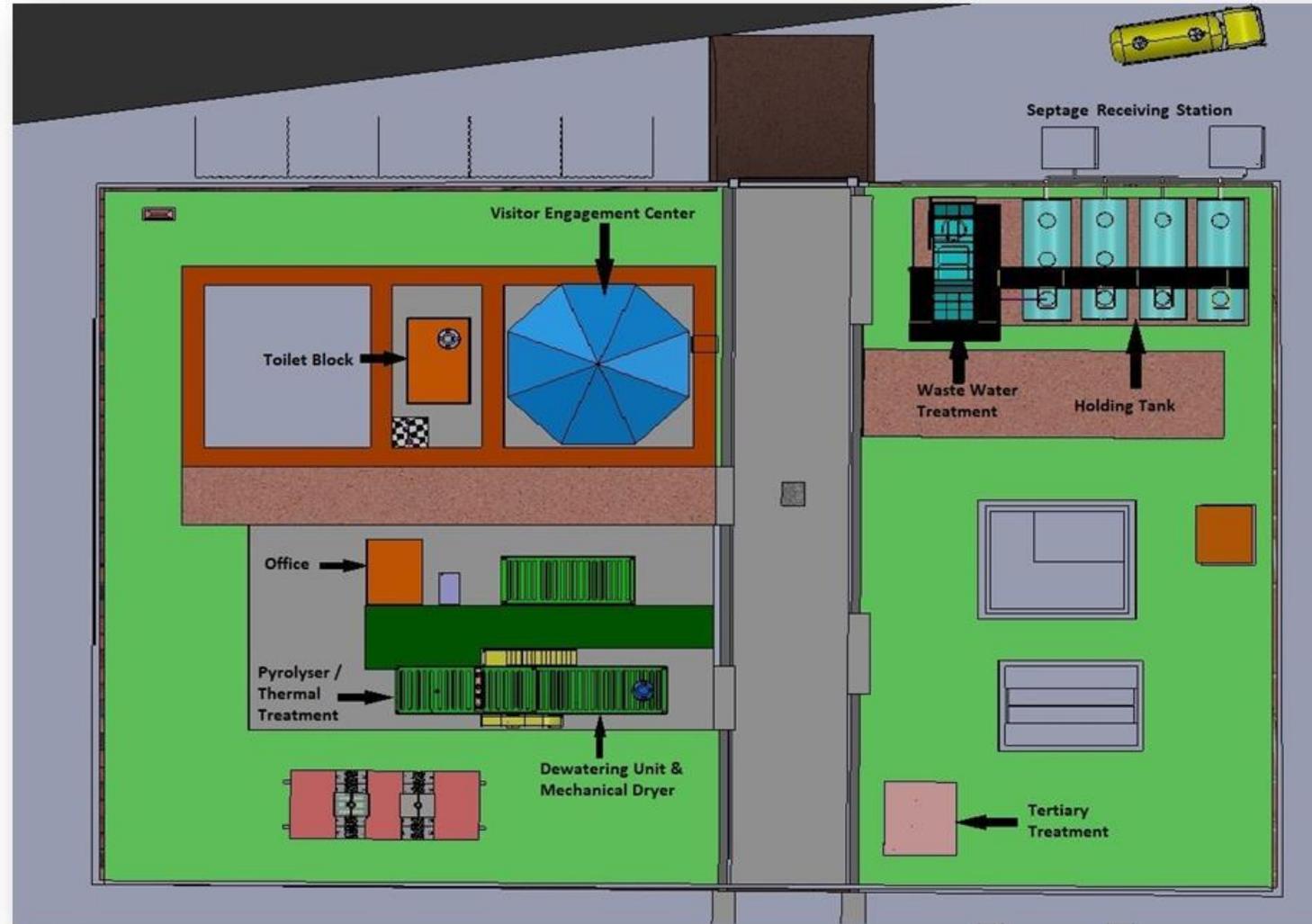
- The system converts Sludge comprising of 30-35% solids to Biochar using a thermal process. It can produce an output of 8 - 10 kg/hr of Biochar
- The thermal process of pyrolysis of the sludge is undertaken at controlled oxygen conditions at 650 - 850 degree Celsius. This is done in order to retain the carbon in the Biochar and not let it escape as CO₂
- During the Thermal Process in the Pyrolyser, flue gases are emitted. A Catalytic Converter is installed which processes these flue gases. The heat in the treated flue gases are used for heat transfer to pasteurization and dryer and let out to the atmosphere safely



PYROLYSIS VISUALS



WAI PLANT LAYOUT



END PRODUCT USAGE



- Thermal Energy:
- For pasteurization / Drying / Power generation

- Biochar:
- For agriculture / building materials / filters



- Treated water:
- For gardening / greenhouse / alternate uses



OTHER USAGE



- VERMICOMPOST SHED



- FIRE FIGHTING FOR SWM SITE

MONITORING SYSTEM



Vacuum suction truck
RFID tag system



Online process
monitoring



Online quality
monitoring system

VACCUM SUCTION TRUCK RFID TAG SYSTEM

Home Administration Report

Dashboard

Search

Date From : 22-08-2019 To : 22-08-2019

Vehicle No :

Search Reset Export To Excel Print

IN-OUT Report

| Vehicle No | In Location | Out Location | IN Punch | OUT Punch | Total Time |
|------------|-------------|--------------|---------------------|---------------------|------------|
| A1 | in | Main Gate2 | 22-08-2019 08:08:30 | 22-08-2019 08:08:36 | 00:00:6 |
| | in | Main Gate2 | 22-08-2019 11:38:04 | 22-08-2019 11:38:11 | 00:00:7 |
| A2 | in | Main Gate2 | 22-08-2019 01:08:40 | 22-08-2019 01:24:08 | 00:15:28 |
| | in | Main Gate2 | 22-08-2019 03:11:37 | 22-08-2019 03:11:43 | 00:00:6 |
| | in | Main Gate2 | 22-08-2019 03:11:44 | 22-08-2019 03:11:44 | 00:00:00 |
| | in | Main Gate2 | 22-08-2019 03:11:45 | 22-08-2019 03:11:48 | 00:00:3 |
| | in | Main Gate2 | 22-08-2019 03:13:35 | 22-08-2019 03:14:36 | 00:01:01 |
| | in | Main Gate2 | 22-08-2019 05:44:43 | 22-08-2019 06:01:12 | 00:16:29 |



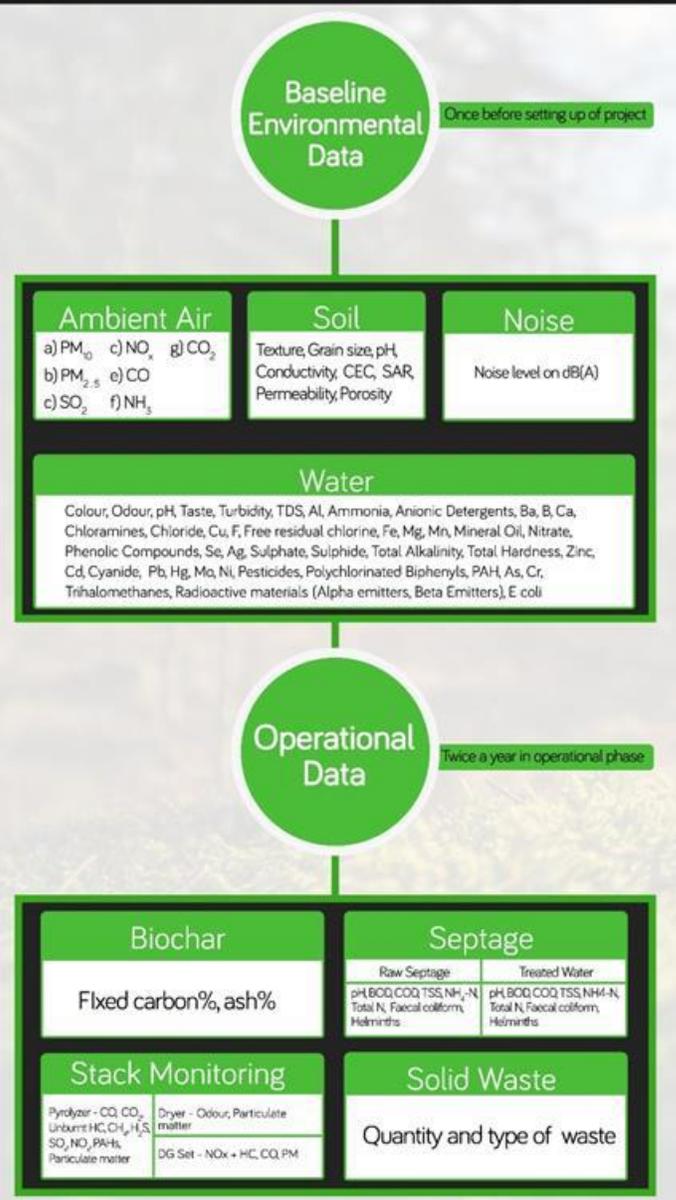
ONLINE PROCESS MONITORING - MOBILE



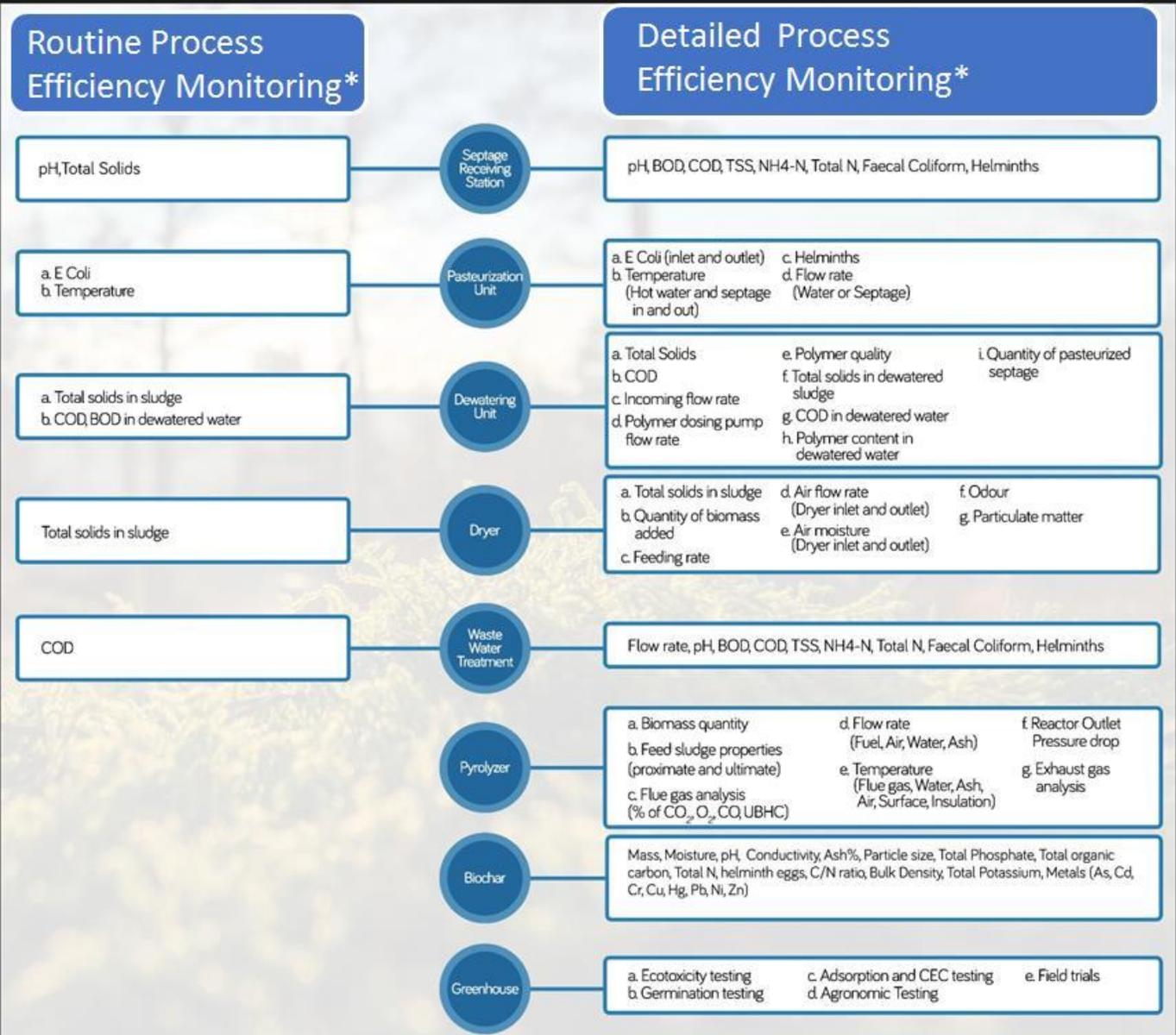
ONLINE QUALITY MONITORING



Environmental Monitoring Plan

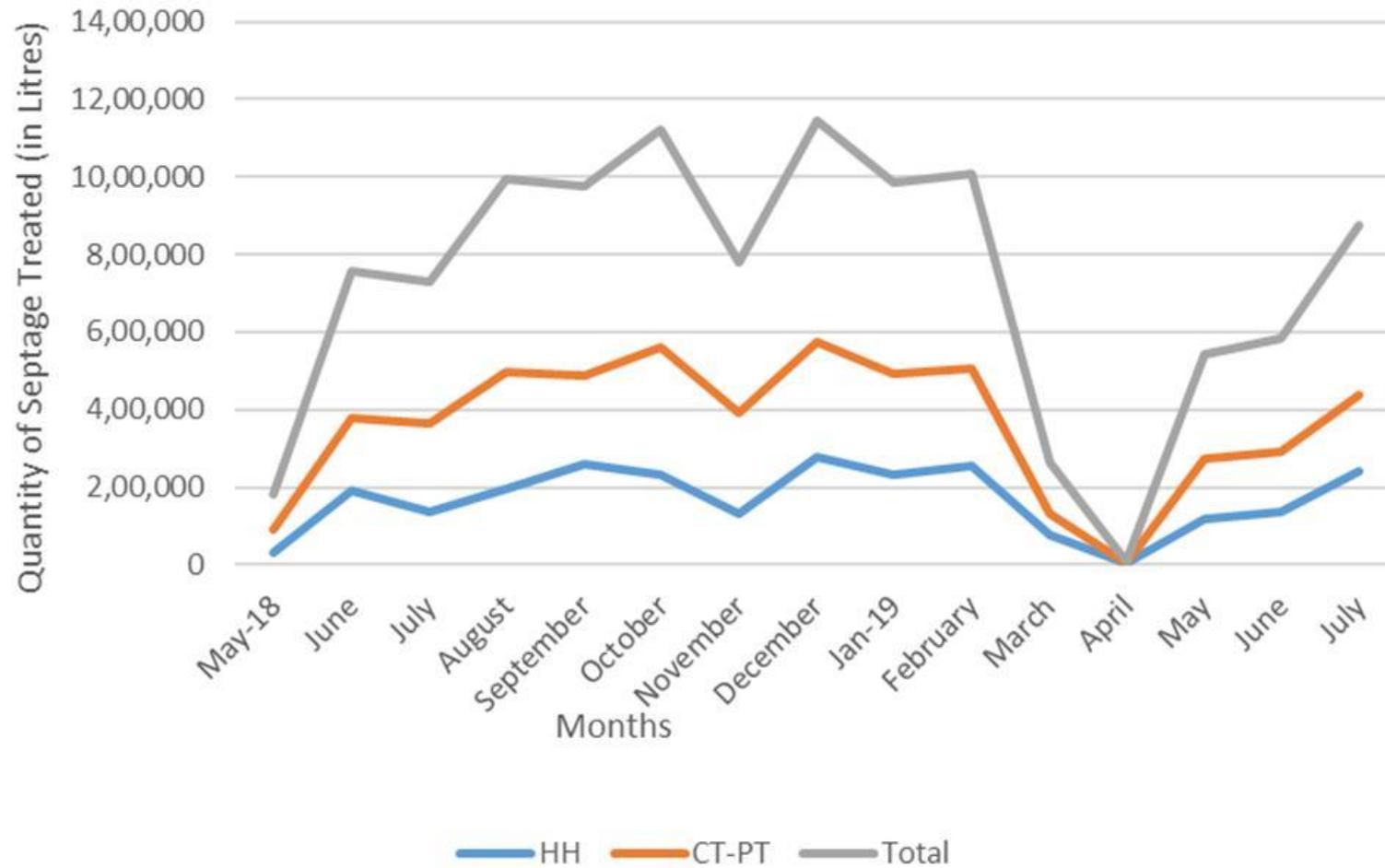


Process Efficiency Monitoring Plan



UTILIZATION

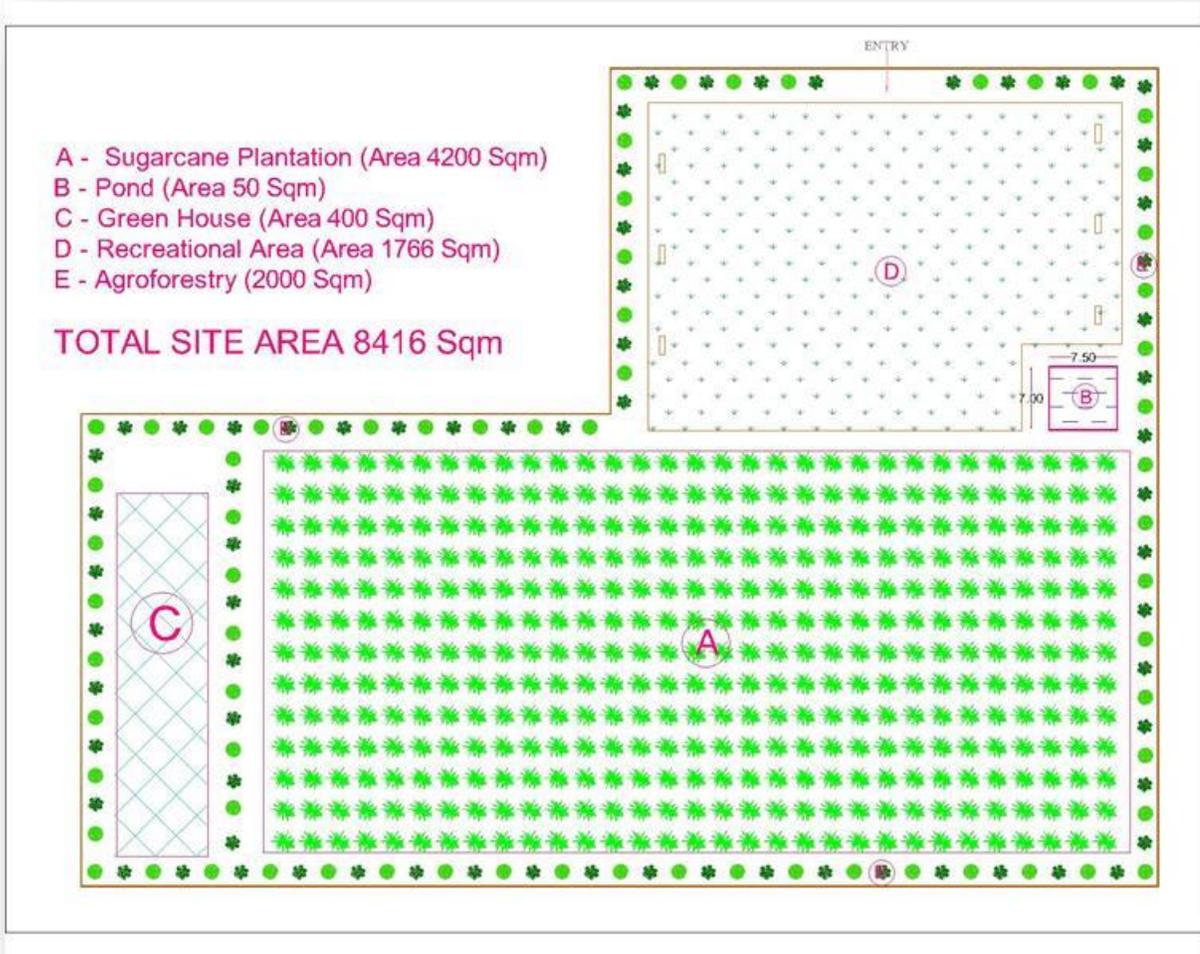
- 5479300 litres of Septage treated till date



Capex and Opex

- Capex – INR 1.8 ~ 2.0 Cr + GST
Depends on site conditions
- Opex – INR 1.5 ~ 2.0 Lakhs/Month
 - 75% Opex – Human Resource
 - 25% Opex – Consumables and utilities

PROPOSED PLAN TO ACHIEVE FINANCIAL SUSTAINABILITY



INCLUSIVITY AT OUR CURRENT PLANTS

- Local recruitment of staff, training in operations and deployment at the sites
- Sanitation Resource Park: Unique concept to bring sanitation messaging, end product reuse and sanitation treatment closer to the people



KEY LEARNING

- Key roles played by State Government, Local ULBs and CEPT
- Support from the ecosystem is key. Constant feedback and improvements
- Range of TS in septage cannot be uniformly predicted. Planning for shock loading is key
- If sufficient biosafety is followed, sanitation work can be for all
- Women can do well in sanitation treatment as much as any man
- Desludging operators are happier unloading in a treatment plant rather than to the environment
- There is a need for development of income earning activities linked to treatment, to achieve financial sustainability

KEY BENEFITS OF OUR TECHNOLOGY



Pathogen kill



Value Added Outputs



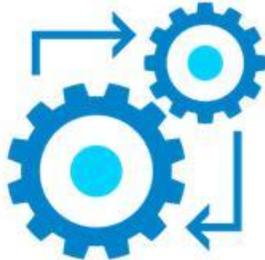
All Weather Systems
(Summer, Winter, Monsoon)



Sludge Treated to Class A biosolids



Modular and Scalable



Easy Integration with
STP / Solid Waste sites

| Container Temperatures | | Biogenic Waste Processor | |
|------------------------|---------------------------|--------------------------|-------------|
| 26°C | 20°C | RUN | 200 Watts |
| Controls | Ambient | 01:40:45 | Power Usage |
| 621°C | | | Prime |
| Pyrolysis Temperature | | | |
| 532°C | 26 | 35 | 20 |
| Catalyst Temperature | Primary Air | Fuel Auger | Char Auger |
| 100°C | Network Connection (SSID) | | |
| Stack Temperature | Data Transfer | | |
| 1800 | Flash Drive | | |
| Oxygen Content | Restart | | |
| | Shutdown | | |
| | Open Door | | |
| | Plot | | |

Remote Monitoring



Quick setup
(6 months from handover of land and approvals)

Low footprint
(1000 m2 for upto 30 KLD.
1500 m2 for upto 50KLD)

THERMAL FECAL SLUDGE AND SEPTAGE TREATMENT PLANTS

| Town | Population | Unique feature |
|----------|------------|--|
| Warangal | 10,00,000+ | One of the largest towns with no UGD or sewerage treatment |
| Narsapur | 55,000+ | Demarcated park allows general public to visit |
| Wai | 45,000+ | Scheduled Desludging in effect. |



- Three plants constructed, inaugurated and are currently operating
- > 5000 KLD septage treated till date
- Setting up 22 more FSTPs (Total Capacity: 325 KLD) in Andhra Pradesh in 2019. Operations for 9.5 years

WAI INAUGURATION



Inauguration on 30th May 2018 by Wai Municipal Council

TIDE TECHNOCRATS

- Tide Technocrats is a pioneering innovative environmental and sustainability consulting organization, based out of Bengaluru, India. Established in 1995
- Tide Technocrats is an empaneled organization under Swachh Bharat Mission by the Ministry of Housing and Urban Affairs, Govt. of India and a member of the National Faecal Sludge and Septage Management Alliance. We are also partners to the Sustainable Sanitation Alliance (SuSanA) a global organization
- In 2017, TTPL is a winner of the Urban Labs Innovation Challenge by uChicago Tata Centre of Development and finalist of the PFAN - USAID challenge for Smart Solutions for Adaptable Communities and Cities. In 2018, TTPL is a finalist in IHUWASH, a national challenge for WASH sector solutions for Mysuru, Udaipur and Faridabad. In 2019, TTPL was awarded the Best Corporate Initiative in Sanitation – Medium Category Corporate at the FICCI – ISCAwards



Solid waste management



Renewable energy



Sanitation



partner of

sustainable
sanitation
alliance



OUR PARTNERS AND SELECT CLIENTS

Some of our esteemed clients are:



Our Partners:





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KARNATAKA

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