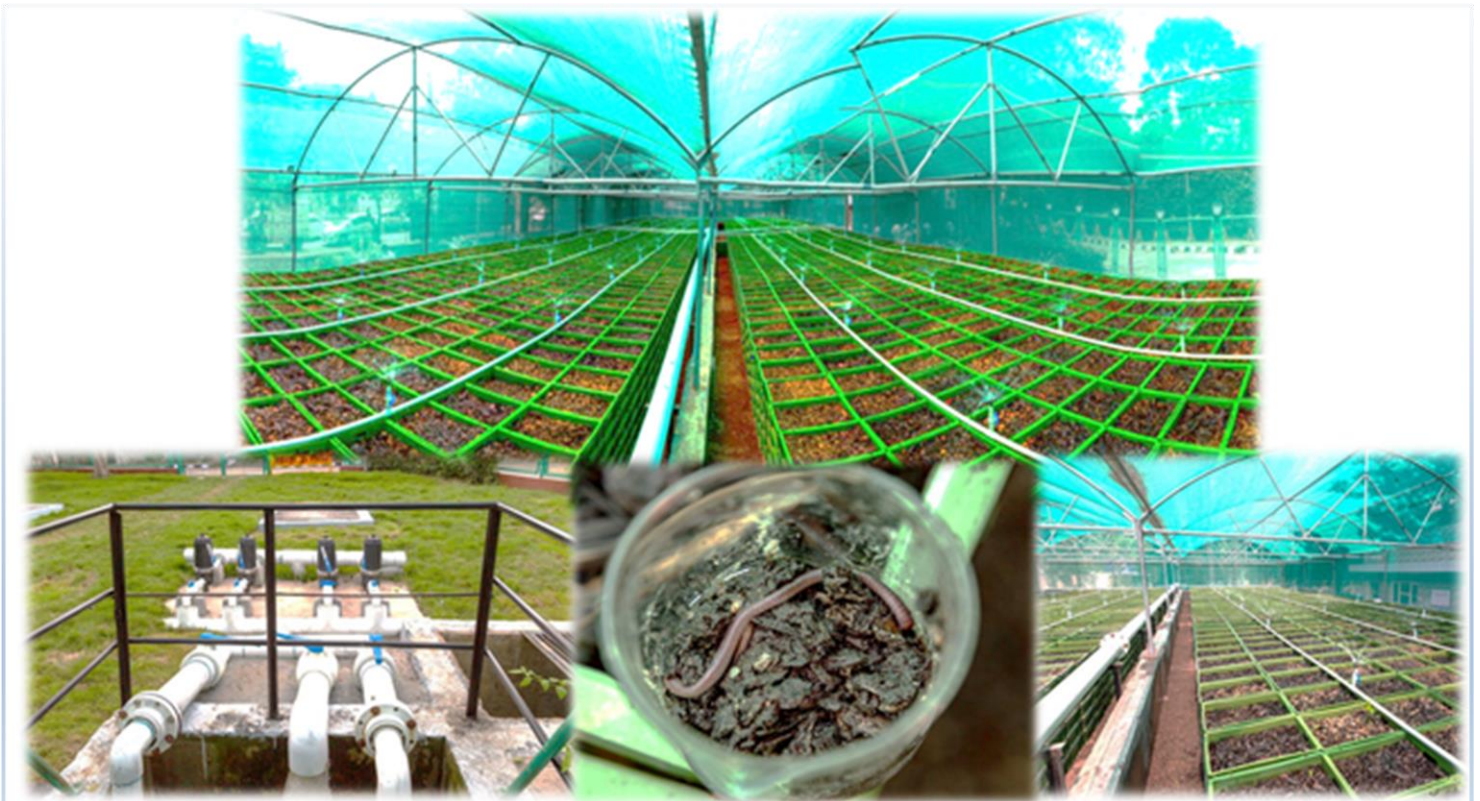


**AWPL VERMI-FILTRATION TECHNOLOGY
FOR
SEWAGE TREATMENT PLANT
(ABSOLUTE VERMI-FILTER™)**



SUBMITTED BY:



**M-58, 3rd Floor, M-Block Market, Greater Kailash – 2
New Delhi 110048, Email: enquiry@absolutewater.in,
Ph.no: +918800835115, Website: www.absolutewater.in**



**AWPL VERMI - FILTRATION TECHNOLOGY
(ABSOLUTE VERMI-FILTER™)**

PROCESS & TECHNICAL BRIEF

AWPL Vermi-Filtration

Background

The conventional principle for treating organic matter or pollutants in wastewater involves microbes and their feeding with oxygen. AWPL Vermi Filtration involves no mechanical aeration. It is based on treating of wastewater using organic and inorganic media and attached growth microbes. The AWPL Vermi-filtration process makes use of Vermi-culture as their one of the key components in reducing organic matter as well as nutrients from wastewater effectively. Vermi-culture in combination of natural and inorganic media gravity filtration serves the treatment of wastewater to re-usable standards. A complete Green Process having multiple benefits in terms of operation, handling and maintenance.

Image 8: AWPL Vermi-Filtration Bed



Feasibility

a. Geographic Requirement

- The site should not be prone to flooding at any time of the year. Modular systems are available to tackle flooding situations.
- The site should be located near the disposal or reuse point or pumping option may be utilized in other cases.
- The Vermi Filter should be accessible from all sides for O&M purpose in general conditions. But in compact system 2 sides of the same can be covered and yet O&M can be carried out easily.
- It is most suitably designed to be implemented in rural areas other than urban. The land requirement is very low as compared to other technologies i.e. 0.75 m²/m³ of wastewater. Modular skid based and large civil based installations are available suiting the requirement as per geography. The Vermi-Filtration technology performs exceptional in terms of change in atmospheric temperature. (-2 degree to 48 degree C)

b. Appropriateness of the AWPL Vermi - Filter Technology



Technical Details

a. Design, Specification and Construction

The AWPL Vermi Filter works on the principle of Vermi-filtration where specially bred worm species and a mix of bacteria act on the suspended and dissolved solids in the raw Sewage and biologically degrade in an environmentally safe manner. This is a continuous process; therefore the treated sewage keeps flowing through an inclined drain at the floor of the Vermi Filter into the treated sewage tank which can be used for further treatment or irrigation/horticulture etc. The criteria for designing the vertical constructed wetland are as follows:

- It can tolerate grey water organic loads upto BOD of 350mg/L
- Settler/sedimentation tank are not required and are replaced by choke free physical micron filtration for silt removal.
- The maximum organic loading for Vermi Filter is BOD 350 mg/L , COD 600mg/L , TSS 700 mg/L

- Graded media is provided
- Uniform distribution via sprinkles of grey water to the surface.

▪ SEWAGE DIVERTING CHANNEL WITH BARSCREENING

The grey water or sewage from village, town or society in rural areas is directed through channels or nallahs and gets collected forming a pond or is directed to existing pond thereby causing pollution and open defecation. The grey water holds good amount of plastic, solids and debris along with them which creates choking hazards and nuisance for any grey water treatment system. To tackle the same manual bar screen are installed in nallahs or drains or channels just before they are about to enter grey water treatment system. These screens allow removing major large size particles and silts up to 6mm size manually by simple gravity screening. The suspended solids (TSS) drop by 25 - 30% under this process there by supporting the downstream process.



▪ STRAINER OR SILT REMOVAL SYSTEM

The sewage is then pumped from collection tank via Strainer system. The strainer is another non electric physical filtration system composed of rings and mesh of 450 microns in size. The sewage passing through it becomes free from silt. It not only removes TSS but it also supports in removing BOD,COD as many food or organic matter particles of small size are removed through the process of straining. The overall removal of TSS is about 70 - 90% and BOD, COD reduction by 10 – 15 %. The strainer is equipped with self-cleansing system or can be cleaned manually. Being small and compact in size it requires least or no maintenance for years. Straining supports in non-clogging of Vermi or Vermi Filtration sewage treatment system.



- **AWPL VERMI FILTER BED**

The sprinkled sewage flows through the bed of bio-filter. The bed consists of 2 different layers. First layer is of 5 stacks of perforated food grade plastic crates filled with special strain of Earthworms and Popular wooden chips. Each stacks takes a depth of 0.2m. The Second layer consists of 3 batches of stones and pebbles of different sizes.



-First Layer or 5 stack of Crates filled with Earthworm and Wooden Chips



:: Process::

Earthworm acts as media to host millions of micro-organisms, which help in rapid degradation of the organic matter and nutrients present in the waste water. Earthworms are versatile waste water decomposers. It promotes the growth of beneficial decomposer bacteria in waste water and acts as an aerator, grinder, and crusher, chemical degrader and a biological stimulator. Earthworms host millions of decomposer microbes in their gut and excreta called vermicast. The nutrients N and P are further used by the microbes for multiplication and enhanced action. The number of bacteria and actinomycetes contained in the ingested material increased up to 1000 fold while passing through the gut. A population of worms numbering about 15000 will in turn fosters a microbial population of billions of millions. The two processes-microbial processes and vermi-process simultaneously work in the Vermi-Filter system. Nitrogen and Phosphorous removal observed 90-97%. BOD & COD reduction observed 90-95%.

-Second layer or 3 batch stone and pebbles media filling



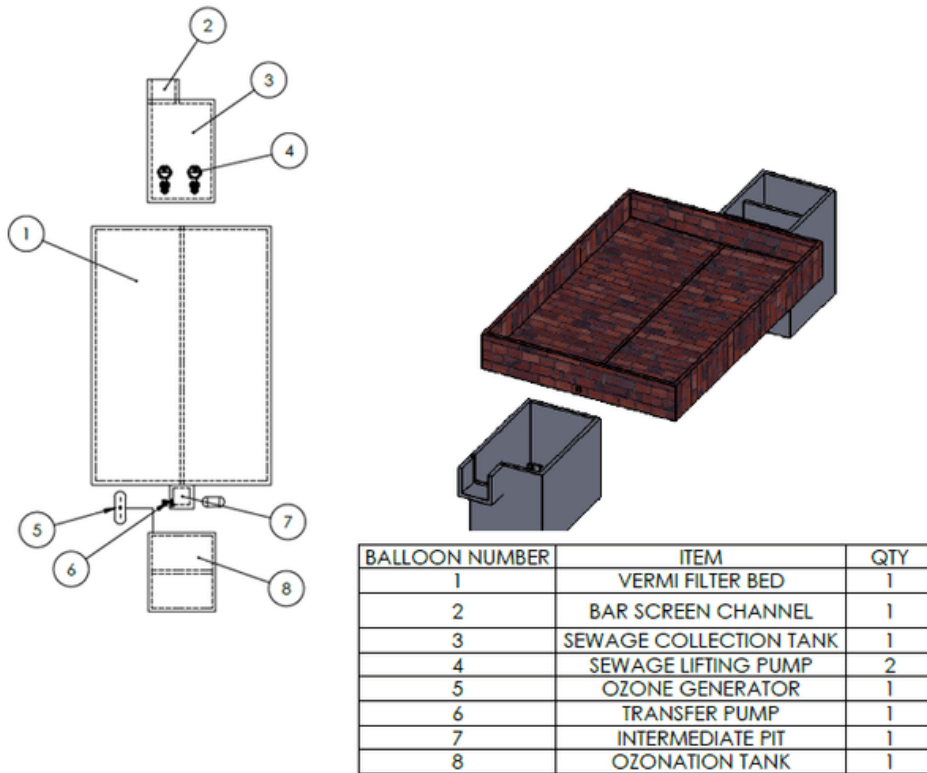
:: Process::

The stone media and sand provides good layer for physical filtration thereby supporting fine TSS (20 - 30%) removal. Further the other two stone batch provides breeding ground for attached growth system of micro-organism contributing in Organic matter removal (BOD/COD 10 – 15%)

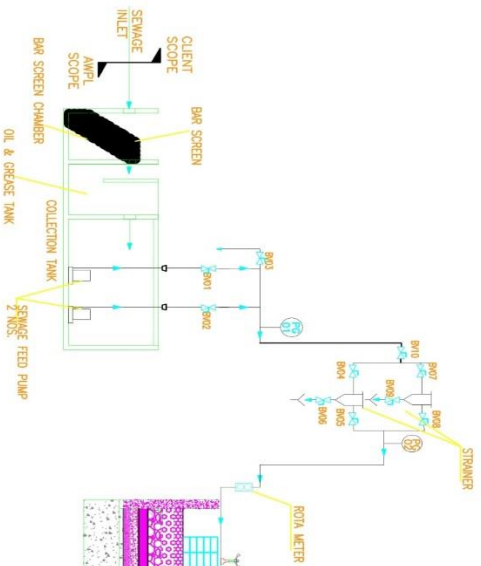
-Design and Engineering

Area required is 0.75 m2 per m3 or 1 KLD. 1KLD requires 15 nos. of crates. Each crate contains 10 kg organic wood and worms. 5 stacks can be arranged by keeping 3 crates in each stack. The crates are perforated for giving breathable environment to earthworms.

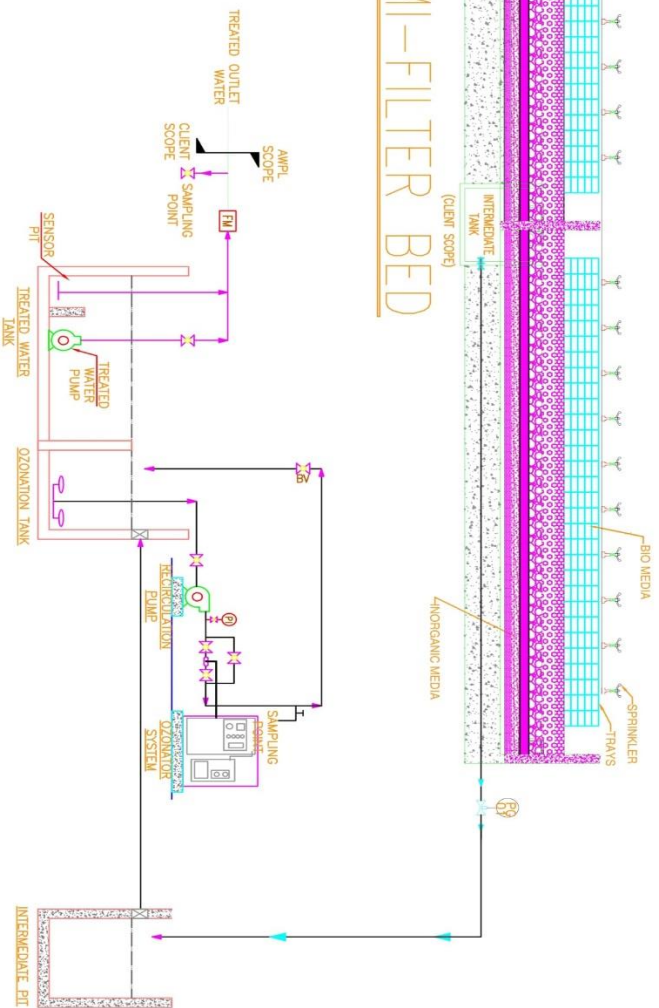
Figure 24: Site Layout of AWPL Vermi Filtration Plant



PIPING & INSTRUMENTATION DIAGRAM FOR VERMI FILTER GREEN STP



VERMI-FILTER BED





b. Operational Details

- AWPL Vermi-Filter System is High efficiency and multi-filter medium which include worms, specially developed microbes, organic & in-organic media.
- Raw sewage pumped from the collection tank is allowed to pass through the screen to remove/separate the macro particles present in the effluent.
- Raw sewage is distributed evenly over the surface of the filter medium, by sprinklers. As the wastewater slowly percolates down, naturally occurring microbes degrade the solids and organic matter, reduce coli from bacteria, and nitrify ammonium, producing clear and odorless water.
- Earthworm acts as media to host millions of micro-organisms, which help in rapid degradation of the organic matter present in the wastewater.
- Filtration through a natural gravity sand filter removes the final traces of suspended solids in the water.
- Advanced Oxidation supports the further break down of COD and BOD, Color and odor and more importantly coli form removal.

c. Operation and Maintenance

- The plant can be operated at very flexible temperature range i.e. -2 to 48 degree C.
- The plant has only 2 electro-mechanical components which runs on least electricity hence operation of plant is almost delete the need of operator.
- Even an unskilled person can operate the plant.
- The plant can be operated based on solar power as well.
- The electricity required for operation of plant is 50% less as compared to other technologies.
- No chemicals are used whatsoever; justifying it to be Organic.
- No sludge generation, therefore, No sludge handling costs.
- Minimal operation and maintenance cost, as the entire design is based on gravity.
- Hence least O&M Intervention in the form of organic media replacement every year. The replenished organic media acts as Fertilizer thereby giving manure and Return on Investment

Other Technical-Commercial Evaluations

<p>Brief on the technology:</p>	<p>AWPL Vermi-Filter System is High efficiency and multi filter medium which include worms, specially developed microbes, organic & in-organic media. -Raw sewage pumped from the collection tank is allowed to pass through screen to remove/separate the macro particles present in the effluent. -Raw sewage is distributed evenly over the surface of filter medium, by sprinklers. As the waste water slowly percolates down, naturally occurring microbes degrade the solids and organic matter, reduce coli from bacteria, and nitrify ammonium, producing clear and odorless water. -Earthworm acts as media to host millions of micro-organisms, which help in rapid degradation of the organic matter present in the wastewater. - Further Filtration through different layer of pebbles and media supports in removal of traces of suspended solids in the water. - Ozone Disinfection is followed for e-coli, color and odor removal making it chemical free system • Innovative Green Process • Works on principle of Vermi-filtration • Eliminates Bacteria • No chemicals used • Odor free • 100% Recovery • Capacities from 2 KLD to 2MLD • NO SLUDGE generation • Very LOW POWER requirement (solar option available) • Can be operated by un-skilled person • Extremely low operating cost, • Low civil cost • Recovered water suitable for: Re-use in Toilets/ • Groundwater Recharging, / Horticulture.</p>
<p>Indicate the compliance to the relevant technical standard of the final technology output:</p>	<p>Treated water meets NGT, CPCB and SPCB norms. The same water can be re-used for irrigation, flushing and washing etc.</p>
<p>If not applicable, then specify reason/other standards followed :</p>	<p>N.A.</p>
<p>Whether the technology is patented:</p>	<p>NO</p>
<p>Nature of patent:</p>	<p>National</p>
<p>Whether any pre-treatment required for adopting the technology:</p>	<p>NO</p>
<p>Nature Of Effluent Disposal:</p>	<p>WATER</p>

Technology Selection Brief		
1.	Technology Name	AWPL VERMI-FILTER™
2.	Technology Category (Treatment / Augmentation / Networks / Monitoring/ Sensors)	Treatment
3.	Technical Details	
a.	<p>Technology Description</p> <p>Please provide a description of how your system works, the problem it addresses, key technology parameters, efficiency</p> <p>If the product has multiple sizes/capacities/ configurations available, please specify the range with appropriate units.</p>	<p>We have installed the country's first 100% Organic Sewage Treatment Plant that treats domestic sewage and converts it into clean water without the use of any chemicals and is NON-RO in nature in order to maintain the natural vitamins and minerals of water.</p> <p style="text-align: center;"><u>The Principal of Vermi STP</u></p> <p>The AWPL VERMI FILTER works on the principle of Vermi-filtration where specially bred worm species and a mix of bacteria act on the suspended and dissolved solids in the raw Sewage and biologically degrade in an environmentally safe manner. This is a continuous process; therefore the treated sewage keeps flowing through an inclined drain at the floor of the Vermi Filter into the treated sewage tank which can be used for further treatment or irrigation/horticulture etc.</p> <p style="text-align: center;"><u>Working Process of Absolute Water's Vermi-STP</u></p> <p><u>1st Level – AWPL VERMI-FILTRATION</u></p> <ul style="list-style-type: none"> • AWPL Vermi Filter System is High efficiency and multi-filter medium which include worms, specially developed microbes, organic & in-organic media. • Raw sewage pumped from the collection tank is allowed to pass through the screen to remove/separate the macro particles present in the effluent. • Raw sewage is distributed evenly over the surface of the filter medium, by sprinklers. As the wastewater slowly percolates down, naturally occurring microbes degrade the solids and organic matter, reduce coli from bacteria, and nitrify ammonium, producing clear and odourless water. • Earthworm acts as media to host millions of micro-organisms, which help in rapid degradation of the organic matter present in the wastewater.

		<p><u>2nd LEVEL-FILTRATION SYSTEM AND OXIDATION</u></p> <ul style="list-style-type: none"> • Filtration through a natural gravity sand filter removes the final traces of suspended solids in the water. • Advanced Oxidation supports the further break down of COD and BOD, Color and odour and more importantly coliform removal. <p><u>3rd LEVEL- MEMBRANE FILTRATION AS ADVANCED TREATMENT (WRS):</u> Specialized membrane filtration System for converting the treated water into potable water quality matching BIS Drinking water standards.</p> <p><u>The Problem we are addressing via our AWPL Vermi Filter</u></p> <p>31 billion litres per day of untreated sewage leaching into our ecosystem which leads to various waterborne diseases, agricultural contamination as well as environmental degradation.</p> <p>In most of the villages and small towns in India, sewage flows untreated, either into the ponds and rivers or percolates into the groundwater, Even in metropolitan towns, like Delhi, more than 70% of the sewage remains untreated and flows into the river Yamuna Water crisis being severe in several metropolitan cities and towns where we have come to a point of day zero.</p> <p>We address this major problem by providing 100% organic water recovery decentralized systems, which is simple, effective, affordable and moreover can be operated by unskilled labour.</p> <ul style="list-style-type: none"> ➤ As far as Our AWPL Vermi-Filtration STP size is concerned we have Installations range from 1KLD to 50 KLD for modular structures and much larger civil based units starting from 100 KLD to 2.0 MLD. ➤ Treated water meets CPCB and SPCB norms. The same water can be reused for irrigation, flushing and washing etc.
b.	What is the special feature that makes it different from other similar existing technologies?	<p>HOW ARE WE DIFFERENT</p> <ul style="list-style-type: none"> ➤ We do not use any Chemicals whatsoever, therefore it is justified as Organic. ➤ No sludge generation, therefore, no sludge handling costs. ➤ Minimal electricity is required for plant operation, as it needs just need power for feeding and for the advanced oxidation step. ➤ 100% of the treated water can be re-used safely making it as a high recovery rate for non-potable applications. ➤ Minimal operation and maintenance cost, as the entire design is based on gravity. ➤ Noise, since there is no aeration equipment required.

		<ul style="list-style-type: none"> ➤ The reject from the system has been tackled by generating a form of liquid soil conditioners which complies to all the stringent norms of CPCB. ➤ It has the shortest stabilization time overall the conventional technologies. ➤ Organic material & warms effectively working in the Temperature ranging from -2^o C to 50^o C. <p>In terms of comparison to similar products available in the market, our Vermi STP solves two of the biggest issues of conventional STPs :</p> <ul style="list-style-type: none"> • Sludge Management: Due to no sludge formation, it eliminates the problem of sludge dewatering, handling and disposal in addition it also saves time and energy consumed during de-sludging activities • Power requirement: has a very low requirement and can also be catered via solar panels. • Extremely low operating costs, as there are no major motors, pumps, dosing system etc. to be maintained • Organic media replacement is humus, bio compost (in every 8-10 month) which have fair economic value for sale. This is one of the most unique characteristics of our Vermi STP, thereby enabling it to be an economically viable and self-sustaining plant that gives financial advantages to the end-user in a circular manner as stated before.
c.	Licenses and Certifications if any	<p>- AWPL VERMI-FILTER™ is recommended and approved by Ministry of Jal Shakti</p> <p>-AWPL VERMI-FILTER Technology is accredited by SIDBI Innovation Centre, IIT KANPUR.</p>
d.	Current Deployment details	<p>We have installed and commissioned 16+ Vermi STP Plants across India and growing. Following are the list of Projects established-:</p> <ol style="list-style-type: none"> 1. DJB (Delhi Jal Board): Kashipur, New Delhi, 100 KLD drinking water plant, August 2015. 2. Silver Oaks, Ahmedabad, 25 KLD modular plant, 2017. 3. Saraswati Medical College, Hapur, U.P: 20 KLD modular plant, 2017. 4. Ecoware, Noida, Drinking water plant, 10 KLD modular unit 2017. 5. Guru Nanak Dev Engg College, Ludhiana, 500 KLD, 2017. 6. Chilkur Balaji Temple, Hyderabad, 60 KLD civil unit, 2018. 7. Surya International, Hotel, Allahabad 20 KLD, 2017. 8. Nuts and Spices, Chennai, 10 KLD, dairy water recovery, 2018. 9. Delhi Technological University, New Delhi 1 MLD, 2019. 10. Ladakh Sarai Hotel, Ladakh, 20 KLD, civil unit, 2019. 11. Bangalore Municipal Department, Whitefield, Smart Toilet System, 10 KLD, modular unit. 12. Gurujal, Pond Rejuvenation, 250 KLD expandable to 500 KLD, Kasan, Gurgaon Administration, Haryana Govt, 2019.

		<p>13. Smart Forte Residential Apartment, (toilet flushing for 36 flats) 15 KLD modular unit, Bangalore.</p> <p>14. Delhi Development Authority, 50 KLD, Civil unit, 2020.</p> <p>15. Patiala Aviation Club 50 KLD STP at Patiala.</p>
e.	Is the technology developed in-house? Are any components of the unit imported? If yes, what percentage of the unit are imported.	Yes, the AWPL Vermi Filter technology is developed in-house and 100% made in India.
f.	Footprint (Please add requirement for at least three capacities of which one should be 10,000 L/day)	
a.	Area Requirement	<p>For 10 KLD Area requirement -: 5 Square meter</p> <p>For 100 KLD Area requirement -: 130 Square meter</p> <p>For 1000 KLD Area requirement -: 1300 Square meter</p>
b.	Power Requirement	<p>For 10 KLD Power requirement -: 1.2 kW/ Hr</p> <p>For 100 KLD Power requirement -: 2.5 kW/ Hr</p> <p>For 1000 KLD Power requirement -: 20 kW/ Hr</p>
c.	Water Requirement	NR
d.	Manpower Requirement (Skilled, semi-skilled, unskilled)	Unskilled
g.	Cost Information	
a.	<p>Capex (INR Lakhs)</p> <p>Please specify the complete project execution cost (including civil, electromechanical and others)</p>	<p>INR 9,90,000/- FOR 10 KLD</p> <p>INR 36,00,000/- FOR 100 KLD</p> <p>INR 1,80,00,000/- FOR 1 MLD</p>

	of three different capacities of which one should be 10,000 L/day	
b.	Opex (INR Lakhs) Please specify the annual O&M cost for three different capacities of which one should be 10,000 L/day). Cost should include power, consumables, manpower, maintenance	<u>INR 16,00,000/- FOR 1000 KLD</u> <u>INR 04,80,000/- FOR 100 KLD</u> <u>INR 02,40,000/- FOR 10 KLD</u>
h.	Does the technology produce any waste (solid and/or liquid)? Solid wastes could include sludge, salts, solid residues etc. Liquid waste could be wastewater or effluent. If yes, then please specify the type and quantity of waste generated per KL of water treated and how it will be disposed	No, our technology does not generate any solid waste instead our earthworm convert the organic media and organic matter present in the sewage into excellent Vermi- compost (in every 8-10 month) which have fair economic value for sale. This is one of the most unique characteristics of our AWPL Vermi STP, thereby enabling it to be an economically viable and self-sustaining plant that gives financial advantages to the end-user in a circular manner as stated before.
i.	Does the system require any replacement of critical components, such as filter media, electrodes, membranes etc.? If YES, please specify the type and frequency (No./year) of replacement in terms of quantity of water treated and average pollutant concentration (e.g. fluoride 5 mg/l)	The organic media (wood chips) has to be refilled once in a year, which is a simple job with nominal budget as the wood chips are naturally easily available in almost all the parts of our country. The replenished media is not a sludge. It is a pure bio-fertilizer that can be used directly to agricultural/horticultural applications without any dewatering equipment/principle.
j.	Details of servicing post Installation	NR
k.	Weblinks with photos and videos of the technology	Weblink – https://www.absolutewater.in <u>Social Media links</u> Facebook Page: https://www.facebook.com/absolute.water.in Twitter : https://twitter.com/absolutewaterin <u>YouTube links:</u> https://www.youtube.com/watch?v=5fKWWVp122w https://www.youtube.com/watch?v=FvV1zAh_qB0&t=339s (Planet healer)

		https://www.youtube.com/watch?v=zhkO_hchlpw&t=450s https://www.youtube.com/watch?v=eQDfg2_EOYk&t=79s
--	--	--

Assured Matrix:

Plant: 1 Plant Size: 1000 Kl/day

AFFORDABILITY:	
a. Capital Cost for different plant size:	
i. Capex of the System:	18000 / KL
ii. Land Requirement for setting up the treatment plant excluding storage, if any required:	1200 M2
iii. Construction materials cost:	18000000
b. Operational Cost (Cost involved in daily operation and periodical maintenance) of the technology:	
i. Electricity Requirement:	20 KWH
ii. No. Manpower required for both installation and O&M with cost:	
1. Skilled:	0
2. Semiskilled:	1
3. Unskilled:	1
iii. Sludge treatment cost:	0
SCALABILITY:	
a. Possibility of Retrofitting into existing system:	YES

b. Is additional construction of structure required (e.g. Platforms, control room etc.):	YES
c. Are the scalable (Capacity) models currently available? (e.g. 1KL,10KL,100KL):	YES
d. Production volume of treated water per day for different plant sizes:	1000
e. Technology Readiness Level(Scale 0-9):	9
f. Is the production capacity easily scalable (i.e. modular units that can be plugged together) to achieve higher volumes:	YES
SUSTAINABILITY:	
a. Is there requirement of addition of chemicals for pre-treatment to input water:	NO
b. Quantity of chemical added per KL:	
d. Sludge Management:	
i. Quantity of Sludge/reject generated from the process: (Kg/KL):	0
ii. Phase/Nature of generated sludge/reject: (Liquid/Gas)	Solid
iii. Can the sludge be completely managed on site?	YES
iv. Is the reject/sludge hazardous in nature?	NO
v. Any pre-treatment of sludge necessary prior to rejection?	NO
vi. Skill set required for management of sludge/reject?	
vii. Any other waste generated annually?	NO
e. Filter Media :	
i. Life of the filter media used. (Yrs):	1
ii. Frequency of replacement of media: (No's per year):	1

f. Is there a dry run projection ² ?	YES
g. Quarantine protocol required for bacterial interventions if any?	NO
UNIVERSALITY	
a. Whether the unit will operate in any terrain type and can be used during disasters?	YES
Specify terrain type and nature of disasters i.e. floods, earthquake, Tsunami etc.:	CAN BE OPERATED AT HILLY AND PLAIN TERRAINS. APART VEHICLE MOUNTED PLANT ARE AVAILABLE TO TACKLE DISASTERS WHERE SEWAGE WATER CAN BE TREATED TO DRINKING WATER STANDARDS
b. Inlet water requirements:	
i. Is the system resilient to abrupt changes in the inlet concentration?	YES
ii. Is pre-treatment of inlet Water required?	NO
c. Does the plant output meets the desired IS standards or other standards?	YES
e. Post-treatment required?	NO
f. No. of installation/No. of Units sold?(Provide with documentary evidence the details of the organizations and companies that have used the product and mention minimum number of plants installed)	1
RAPID:	
a. Production and Stocks:	
b.	
i. What is the production capacity per annum? (No. of units/Year).	4
ii. Number of Production facilities? (Provide Details of production facilities with capacities) (No. of units).	1

b. Installation and Commissioning:	
i. Time required for Installation and commissioning of 1 unit (Days).	270
ii. Is in-situ/prefabricated installation possible?	NO
c. Is remote monitoring of Unit possible?	YES
EXCELLENCE :	
a. State of Patent Application?	Applied
b. Is the product certified by other national/international agency (NSF/WQA/ISO/BIS etc.)?	YES
i. Kindly give details:	Jal Shakti Ministry / SIDBI INNOVATION CENTRE - IIT KANPUR
c. Replacement of parts required? (No./year)	1
d. Any other specific excellence criteria observed or claimed by the vendor. Outline service organizations (Locations, no. of people etc..) (No./year) (No./year)	1
e. Does the unit/device improve overall sewage quality apart from regular treatment process(No./year):	YES
DISTINCTIVE :	
1. Manufacturing of components for assembling of the plant:	Completely Indigenous
b. Any other distinctive feature of the product in terms of any of the above parameters?	GREEN & ECO-FRIENDLY TECHNOLOGY SCALABLE AND MOBILE PORTABLE UNITS SKID BASED SYSTEMS

Plant: 2 Plant Size: 100 Kl/day

AFFORDABILITY:	
a. Capital Cost for different plant size:	
i. Capex of the System:	36000 / KL

ii. Land Requirement for setting up the treatment plant excluding storage, if any required:	100m ²
iii. Construction materials cost:	3600000
b. Operational Cost(Cost involved in daily operation and periodical maintenance) of the technology:	
i. Electricity Requirement:	2.5 KWH
ii. No. Manpower required for both installation and O&M with cost:	
1. Skilled:	0
2. Semiskilled:	1
3. Unskilled:	1
iii. Sludge treatment cost:	0
SCALABILITY:	
a. Possibility of Retrofitting into existing system:	YES
b. Is additional construction of structure required (e.g. Platforms, control room etc.):	YES
c. Are the scalable (Capacity) models currently available? (e.g. 1KL,10KL,100KL):	YES
d. Production volume of treated water per day for different plant sizes:	100
e. Technology Readiness Level (Scale 0-9):	9
f. Is the production capacity easily scalable (i.e. modular units that can be plugged together) to achieve higher volumes (Show proof):	YES
SUSTAINABILITY:	
a. Is there requirement of addition of chemicals for pre-treatment to input water:	NO
b. Quantity of chemical added per KL:	
d. Sludge Management:	

i. Quantity of Sludge/reject generated from the process: (Kg/KL):	0
ii. Phase/Nature of generated sludge/reject: (Liquid/Gas)	Solid
iii. Can the sludge be completely managed on site?	YES
iv. Is the reject/sludge hazardous in nature?	NO
v. Any pre-treatment of sludge necessary prior to rejection?	NO
vi. Skill set required for management of sludge/reject?	
vii. Any other waste generated annually?	NO
e. Filter Media :	
i. Life of the filter media used.(Yrs):	1
ii. Frequency of replacement of media: (No's per year):	1
f. Is there a dry run projection ² ?	YES
g. Quarantine protocol required for bacterial interventions if any?	NO
UNIVERSALITY:	
a. Whether the unit will operate in any terrain type and can be used during disasters?:	YES
Specify terrain type and nature of disasters i.e. floods, earthquake, Tsunami etc:	ALL KINDS OF HILLY AND PLAIN TERRAINS. VEHICLE MOUNTED UNITS AVAILABLE FOR SEWAGE TREATMENT TO CONVERT THEM TO DRINKING WATER STANDARDS
b. Inlet water requirements:	
i. Is the system resilient to abrupt changes in the inlet concentration?	YES
ii. Is pre-treatment of inlet Water required?	NO
c. Does the plant output meet the desired IS standards or other standards?	YES

e. Post-treatment required?	NO
f. No. of installation/No. of Units sold?(Provide with documentary evidence the details of the organizations and companies that have used the product and mention minimum number of plants installed)	4
RAPID:	
a. Production and Stocks:	
i. What is the production capacity per annum? (No. of units/Year).	25
ii. Number of Production facilities? (Provide Details of production facilities with capacities) (No. of units) .	1
b. Installation and Commissioning:	
i. Time required for Installation and commissioning of 1 unit (Days).	90
ii. Is in-situ/prefabricated installation possible?	NO
c. Is remote monitoring of Unit possible?	YES
EXCELLENCE :	
a. State of Patent Application?	Applied
b. Is the product certified by other national/international agency (NSF/WQA/ISO/BIS etc.)?	YES
i. Kindly give details:	Jal Shakti Ministry / SIDBI INNOVATION CENTRE - IIT KANPUR
c. Replacement of parts required? (No./year)	1
d. Any other specific excellence criteria observed or claimed by the vendor. Outline service organizations (Locations, no. of people etc..) (No./year) (No./year)	1

e. Does the unit/device improve overall sewage quality apart from regular treatment process(No./year):	YES
DISTINCTIVE :	
1. Manufacturing of components for assembling of the plant:	Completely Indigenous

Plant: 3 Plant Size: 10 Kl/day

AFFORDABILITY:	
a. Capital Cost for different plant size:	
i. Capex of the System:	99000 / KL
ii. Land Requirement for setting up the treatment plant excluding storage, if any required:	1
iii. Construction materials cost:	990000
b. Operational Cost(Cost involved in daily operation and periodical maintenance) of the technology:	
i. Electricity Requirement:	1.2 KWH
ii. No. Manpower required for both installation and O&M with cost:	
1. Skilled:	0
2. Semi-Skilled:	1
3. Unskilled:	1
iii. Sludge treatment cost:	0
c. Cost of treated Water (Life Cycle cost)¹:	83
SCALABILITY:	
a. Possibility of Retrofitting into existing system:	YES
b. Is additional construction of structure required (e.g. Platforms, control room etc.):	YES
c. Are the scalable (Capacity) models currently available? (e.g. 1KL,10KL,100KL):	YES

d. Production volume of treated water per day for different plant sizes:	10
e. Technology Readiness Level(Scale 0-9):	9
f. Is the production capacity easily scalable (i.e. modular units that can be plugged together) to achieve higher volumes (Show proof):	YES
SUSTAINABILITY:	
a. Is there requirement of addition of chemicals for pre-treatment to input water:	NO
b. Quantity of chemical added per KL:	
d. Sludge Management:	
i. Quantity of Sludge/reject generated from the process: (Kg/KL):	0
ii. Phase/Nature of generated sludge/reject: (Liquid/Gas)	Solid
iii. Can the sludge be completely managed on site?	YES
iv. Is the reject/sludge hazardous in nature?	NO
v. Any pre-treatment of sludge necessary prior to rejection?	NO
vi. Skill set required for management of sludge/reject?	
vii. Any other waste generated annually?	NO
e. Filter Media :	
i. Life of the filter media used.(Yrs):	1
ii. Frequency of replacement of media: (No's per year):	1
f. Is there a dry run projection?	YES
g. Quarantine protocol required for bacterial interventions if any?	NO
UNIVERSALITY:	

a. Whether the unit will operate in any terrain type and can be used during disasters? :	YES
Specify terrain type and nature of disasters i.e. floods, earthquake, Tsunami etc:	PLANT CAN BE INSTALLED IN HILLY AND PLAIN TERRAINS. VEHICLE MOUNTED UNITS AVAILABLE FOR CONVERTING SEWAGE WATER TO DRINKING WATER WHICH CAN BE USED IN DISASTERS
b. Inlet water requirements:	
i. Is the system resilient to abrupt changes in the inlet concentration?	YES
ii. Is pre-treatment of inlet Water required?	NO
c. Does the plant output meet the desired IS standards or other standards?	YES
e. Post-treatment required?	NO
f. No. of installation/No. of Units sold?(Provide with documentary evidence the details of the organizations and companies that have used the product and mention minimum number of plants installed)	4
RAPID:	
a. Production and Stocks:	
i. What is the production capacity per annum? (No. of units/Year).	100
ii. Number of Production facilities? (Provide Details of production facilities with capacities) (No. of units) .	1
b. Installation and Commissioning:	
i. Time required for Installation and commissioning of 1 unit (Days).	30
ii. Is in-situ/prefabricated installation possible?	NO

c. Is remote monitoring of Unit possible?	YES
EXCELLENCE :	
a. State of Patent Application?	Applied
b. Is the product certified by other national/international agency (NSF/WQA/ISO/BIS etc.)?	YES
i. Kindly give details:	Jal Shakti Ministry / SIDBI INNOVATION CENTRE - IIT KANPUR
c. Replacement of parts required? (No./year)	1
d. Any other specific excellence criteria observed or claimed by the vendor. Outline service organizations (Locations, no. of people etc..) (No./year) (No./year)	1

Case Study

A Case Study on AWPL Vermi Filter - Sewage Treatment Plant (STP), Kasan, Gurugram (Pond Rejuvenation Under Gurujal Water Management Initiative)

GURUJAL - An Initiative taken by Gurugram Administration
Project Executed by – Absolute Water Pvt. Ltd

The basic needs of human survival, i.e., water, food & shelter are no more easily accessed resources. The ever-increasing demand of human being cannot be meet successfully through present conventional resources. The Increasing population explosion raises the demand for food and fodder to continue life on earth. Due to domestic waste, sewage and industrialization, our environment (rivers, ponds and other natural resources) are polluting. In the Indian context, the situation is very drastically.

31 billion liters per day of untreated sewage leaching into our ecosystem Which Leads to various waterborne diseases, agricultural contamination as well as environmental degradation. In most of the villages and small towns in India, sewage flows untreated, either into the ponds and rivers or percolates into the groundwater. Even in metropolitan towns, like Delhi, more than 70% of the sewage remains untreated and flows into the river Yamuna Water crisis being severe in several metropolitan cities and towns where we have come to a point of day zero such as the same in South Africa.



The situations have only been handled by not throwing sewage directly to natural resources and reuse the treated water that ultimately reduces the overall demand of freshwater. However, India treats only 20% of its sewage and rest fall directly into rivers causing severe problems.



Gurugram has been facing a water crisis at an alarming rate. The rapid urbanization and constant pressure on the groundwater has led to it being a DARK ZONE. To address this issue the government has formulated an initiative named Guru-Jal.

It is an INTEGRATED WATER MANAGEMENT initiative under the District Administration of Gurugram, Govt. of Haryana in collaboration with, Hero, CII, TERI SAS etc, to understand the gravity and the root causes of the problem. It aims to address the issue using systems thinking approach with creative design solutions.

It invites everyone to be a part in prioritizing, protecting, and preserving our most valuable natural resource. Its urges each and every individual to GET WATER CONSCIOUS.



Gurujal had hosted a WASTEWATER TREATMENT EXPO in Gurugram on Friday, August 16, 2019. It was one step closer to revive the dying water ponds in Gurugram district. We (**Absolute Water Pvt. Ltd**) have participated in the Expo and being selected by the Panel of Jury having four members from the Field Experts Dr Fawzia Tarannum (Asst. Professor, TERI SAS), Mr Vijay Dasmana (Chief Ecologist and Consultant at I am gurgaon), Chetan Agarwal (Environmentalist, CEDAR), Vandana Menon (Design Architect, Previously worked at CSE) and three members from the Administrative Officials Mr Munish Sharma (Additional Commissioner, Municipal Corporation Gurugram), Mr Lalit Arora (SE, GMDA), Mr. Narinder Sarwan (District Development and Panchayat Officer) as an Innovative Technology to win a live project for the District Administration Gurugram under 'Support A Pond' intervention.

Details of Kasan Gram Panchayat and Kasan Pond

Kasan Pond (Kasan)



LOCATION: Near Sr. Sc. School, Kasan Village, Manesar Tehsil

AREA: 4.5 Acre

DEPTH: 9 feet

GP FREE LAND: 500 Acre

POPULATION: 10000+

HOUSEHOLDS: 1723

Sr. no.	Unique ID	Capacity	Tehsil Name	Village name	Latitude	Longitude	Area (acres)	Ownership
1	250-28.35651-76.892254	45000 CUM	Manesar	Kasan	28.35651	76.892254	4.5	Gram Panchayat

GPS IMAGE:



CURRENT STATUS:

Through the field visit, the following conclusion has been drawn:

1. Low Lying Waterlogged Area with Dirty Sewage water of the village, surrounded by the Gram Panchayat land.
2. Water contamination due to the constant discharge of the sewerage water from the village.
3. The Pond Water contains Water Hyacinth, Dirty Water and Solid and Plastic waste.
4. Absence of a Spillway at the location.
5. The pond is at depressed waterlogged Area, will be receiving the excess water of rainfall also May results in overflow.
6. The base of pond is filled with the silt which is not allowing the water to percolate into ground and thus increasing the volume of the pond.
7. Since the Water Body mostly contains the Sewage Waste, hence the **Most Important Contaminants** with their Sources and Environmental Significance are:

Important Waste Water Contaminants

Sl. No	Contaminant	Source	Environmental significance
1	Suspended solids	Domestic use, industrial wastes	Cause sludge deposits and anaerobic condition in aquatic environment
2	Biodegradable organic	Domestic use , industrial wastes	Cause biological degradation
3	Pathogens	Domestic water	Transmit communicable disease
4	nutrients	Domestic and industrial waste	Cause eutrophication
5	Refractory organics	Industrial waste	Cause taste and odour problems

Different Phases of Construction of 250KLD AWPL Vermi -Filter STP

Based on the data provided by the Gurujal team, Absolute Water proposed the AWPL Vermi -Filter STP of size 250KLD as per the current wastewater produced by the gram panchayat. Considering the future aspect of increased in the population of Gram panchayat this existing Vermi STP can be expanded up to 500KLD.



Selection of suitable site near the pond

Site clearance and laid down the foundation of Vermi -Filter STP bed





Details of proposed AWPL VERMI -FILTER STP

- **Inlet source of water** – Domestic sewage
- **Area required for Plant** – 500 sq.meter
- **Power consumption** – 5 Kw/Hr
- **Plant capacity** – 250 KLD per day.
- **Organic manure generation** – 24 ton per year.

Treated water usage

- Sale of treated wastewater for-:
 - Construction sites.
 - Maintenance of neighboring industrial units.
- Agriculture.
- Hydrating for Bio-Diversity Park of 250 acres.
- Pond to be converted into Tourist Lake activities



**(ABSOLUTE VERMI-FILTER™)
RECOMMENDATION & CERTIFICATIONS**



SIDBI INNOVATION AND INCUBATION CENTRE
INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Recommendation Letter

I, Prof. Sameer Khandekar son of Mr. Vidyadhar B. Khandekar, in my capacity as Coordinator of SIDBI Innovation & Incubation Centre, IIT Kanpur have examined the request of Ms. Smita Singhal, Mr. Nishant Singhal and Mr. Narinder Singh Directors of Absolute Water Pvt. Ltd. to validate the nature of business and after due examination, I recommend that the business being pursued by the applicant is innovative in nature and may therefore be considered as a business covered under the definition of Startup as per the notification no GSR 180(E) dated February 17, 2016(F. No. 5(91)/2015-BE.I)

The detailed reasons for the recommendation are provided in the annexure to this letter.

A handwritten signature in blue ink, appearing to read 'Sameer Khandekar', with a horizontal line underneath.

Prof. Sameer Khandekar
Coordinator, SIIC, IIT Kanpur
Associate Dean Innovation & Incubation

Date: 11.05.2017

Place: Kanpur

SIDBI Innovation & Incubation Centre IIT Kanpur

SIIC, IIT Kanpur is glad to recommend Absolute Water Pvt Ltd for “2017 Start-up recognition “

- **Company Name:** Absolute Water Pvt Ltd
- **Corporate Identity Number :** U29190DL2016PTC289934
- **Website Address :** www.absolutewater.in
- **Promoters Name :** Ms Smita Singhal, Mr. Nishant Singhal, Mr. Narinder Singh
- **Product :** Vermifilter Green STP
- **Detail of Innovation/Innovativeness:** A water recovery system which converts raw sewage into drinking water levels. Special membrane and ozonation methods are used to bring the water to quality achieved. First in the country to have 100% green STP based on vermifiltration. A fully sustainable water recovery system having no chemical usage, no sludge generation, low power.

Unique green technology that can be used in a decentralized way to treat the sewage in cluster and recover portable quality water which meets the WHO standards of drinking water.

- **Achievements:**
 1. Technology approved by NMCG .
 2. An approved technology for water recovery systems from the DJB.
- **Any Other Detail:** Completed 4 installations in 1 year:
 1. Delhi Jal Board, Keshopur, Delhi
 2. Guru Nanak Engineering college , Ludhiana, Punjab
 3. River Costa Hotel, Varanasi, UP
 4. Ecoware Factory, Noida

Thanking you
Sincerely

Sameer Khandekar
Associate Dean, Innovation and Incubation
SIDBI Innovation and Incubation Centre
Indian Institute of Technology Kanpur
Kanpur 208 016 India

Prof. Sameer Khandekar
Coordinator, SIIC, IIT Kanpur
Associate Dean Innovation and Incubation
Room No. F-7
SIDBI Innovation & Incubation Centre, IIT Kanpur
Phone: 0512-2597038
Email: samkhan@iitk.ac.in;



**(ABSOLUTE VERMI-FILTER™)
INSTALLATION AND PERFORMANCE PROOFS**

Engineering Cell
DELHI TECHNOLOGICAL UNIVERSITY
Shahbad Daulatpur, Main Bawana Road, Delhi-110042

F.No.DTU/Engg Cell/001959/2017/Civil/

5201

Dated: 20/3/18

To

M/s Absolute Water Pvt. Ltd.
M-55, 3rd Floor, M Block Market
Greater Kailash-2, New Delhi-110048

**Sub: C/o Sewerage Treatment Plant & Waste to Energy Plant at DTU, Bawana, Road, Delhi.
Sub Head – Designing, Supply, Erection & Installation, Commissioning & there to
operation & maintenance for 15 years of 1 M.L.D. STP based on Bio filter & 1 TPD Waste
to Energy Plant.**

Sir,

Your percentage rate tender for the work of C/o Sewerage Treatment Plant & Waste to Energy Plant at DTU, Bawana, Road, Delhi. Sub Head – Designing, Supply, Erection & Installation, Commissioning of STP and WTE Plant has been accepted on behalf of DTU per terms and condition as given below:

1.	Estimated Cost	Rs.2,40,00,000/- (Rupees Two crore forty lakhs only) plus GST
2.	Quoted/ accepted rates (Tendered Amount)	Rs.3,00,90,000/- (Rupees Three crore ninety thousand only) i.e. Rs.2,55,00,000/- plus GST
3.	Accepted percentage rate under clause-12	6.25% (Six decimal two five only) above the estimated cost
4.	Time allowed	09 (Nine) months

Schedule of work is enclosed.

1. Your letter no. nil dated 20/03/2018 vide which performance guarantee of Rs.12.75,000/- (Rupees Twelve lakhs seventy five thousand only) through Performance Bank Guarantee bearing no. 064018IGPER0061 dated 19/03/2018 issued by Dena Bank, Nehru Place, New Delhi-110019 for the above work has been received by this office. The Bank Guarantee is valid upto 23.03.2019. The work is awarded subject to verification of Performance Bank Guarantee from the Banker.
2. You are requested to submit a non-judicial stamp paper worth Rs. 100/- (Rs. One Hundred only) within fifteen days (if not submitted) from the date issue of this letter for signing an agreement failing which the acceptance of the work shall be withdrawn and the entire amount of Performance Guarantee/EMD shall be forfeited.
3. Please note that the time allowed for carrying out the work shall be reckoned from the 10th day after the date of issue of letter of acceptance i.e. 13.03.2018.
4. The execution of work of operation & maintenance for 15 years of 1 M.L.D. STP based on Bio filter & 1 TPD Waste to Energy Plant shall be dealt and communicated separately.
5. You are requested to contact the undersigned to start the work at once.

Encls: As above

Rajni
20/3/2018
Executive Engineer, DTU

F.No.DTU/Engg Cell/001959/2017/Civil/

5201

Dated: 20/3/18

Copy to:-

1. P.S to Hon'ble V.C for kind information to of Hon'ble Vice Chancellor.
2. PA to Pro-VC-I for kind information of Pro-VC-I
3. Registrar, DTU
4. Deputy Registrar (F&A), DTU.
5. Sr. A.O. (Engg.Cell), DTU.
6. J.E. (Civil), DTU.
7. Guard File

Rajni
Executive Engineer, DTU



CV

Project Office
DELHI TECHNOLOGICAL UNIVERSITY
Shahbad Daulatpur, Main Bawana Road, Delhi-110042

COMPLETION CERTIFICATE

Name of Work : C/o Sewerage Treatment Plant & Waste to Energy Plant at DTU, Bawana, Road, Delhi. (S.H. - Designing, Supply, Erection & Installation, Commissioning & there to operation & maintenance for 15 years of 1 M.L.D. STP based on Bio filter & 1 TPD Waste to Energy Plant)

Agency : M/s Absolute Water Pvt. Ltd.

Agreement No. : DTU/Engg,Cell/001959/2017/Civil

Date of Start (S) : 20.03.2018


Date of Start (A) : 20.03.2018

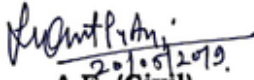
Date of Completion (S) : 19.12.2018

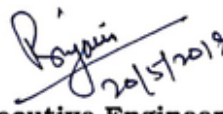
Date of Completion (A) : 20.05.2019

Certified that the work has been physically completed on dated **20.05.2019** and plant running successfully and no defects are apparent and the contractor has removed, from the premises on which the work was being executed all scaffolding surplus material and building rubbish and cleared all the dirt from all wood work, doors, windows, walls, floors or other parts of buildings, in upon all about which the work was to be executed or of which he had possession for the purpose of execution thereof.

This is however subjected to measurements being recorded and quality being checked by the competent authority.


Junior Engineer, Civil
20.05.2019


20.05.2019
A.E. (Civil)


20/5/2019
Executive Engineer, DTU
ER. BIMAL JAIN
Executive Engineer (Civil)
Delhi Technological University



WATER LABORATORY

DELHI POLLUTION CONTROL COMMITTEE
4TH FLOOR, ISBT BUILDING, KASHIMERE GATE, DELHI-110006
visit us at <http://dpccocmms.nic.in>

Result No- DPCC/Comm/W/2216/656

14/08/2019

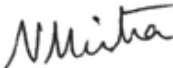
Date:13/08/2019

LAB REPORT

1. Name & Address of Unit : M/s.Delhi Technological University
Shahbad Daulatpur Bawana Road New Delhi
Delhi-110042
2. Sampling Location : STP Outlet
3. Date of sampling : 30/07/2019
4. Sample collected by : DPCC Lab
5. Control Measure (if any) : STP
6. Nature of sample : Grab
7. Nature of Industry : Shopping Malls, Housing / Commercial/ Office Complexes having
built up area 20,000 sqm and above
8. Parameter analyzed and result

S. No.	Parameters	STP Outlet	Prescribed Standard
1	pH	7.2	5.5-9.0
2	Total Suspended Solids (TSS)	8	30.0
3	Oil and Grease	0.8	10.0
4	Dissolved Phosphate (as P)	0.6	5.0
5	Chemical Oxygen Demand(COD)	24	250.0
6	Nitrate Nitrogen	1.1	10.0
7	Bio-Chemical Oxygen Demand(BOD)[3 days at 27°C]	7	20.0
8	Ammonical Nitrogen	2.1	50.0

*All parameters are in mg/l except pH


Dr Nandita Moitra
I/C Water Laboratory
Dr. NANDITA MOITRA
Scientist 'C'


Scientific Assistant



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

19, University Road, Delhi – 110007 (India)
An ISO - 9001, 14001 & OHSAS 18001 Certified Institute

Website : www.shriraminstitute.org
E-mail id : customercare@shriraminstitute.org

Comb
C

TEST CERTIFICATE

NO. : C1/0000247207

Issued To:

Client Code : A2364
ABSOLUTE WATER PVT. LTD.
M-58, MARKET GREATER KAILASH -II
NEW DELHI
DELHI-110048
Kind Attn:

Date 19/02/2021

Job No. 2102-1-411-1001

Booking No. RG2021/1/9632

Booking Date 08/02/2021

Customer Ref No. EMAIL

Customer Ref Date 05/08/2020

ULR NO. TC544421000002274F



Sample Description :

ONE SAMPLE OF WASTE WATER MARKED AS "STP INLET", LOCATION : DELHI TECHNOLOGICAL UNIVERSITY, WAS RECEIVED.

Note: The sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on the declaration by party.

S.No. Tests	Results	Protocol
1. pH	7.2	IS: 3025, Pt-11-1983, RA 2017
2. Total Nitrogen (as N), mg/l	17	IS: 3025 Pt-34-1988, RA 2019
3. Total Phosphorous (as P), mg/l	9.4	IS: 3025 Pt-2- 2019
4. Total Suspended Solids, mg/l	1316	IS: 3025 Pt-17-1984, RA 2017
5. Oil & Grease, mg/l	30	APHA 23rd Ed 5520
6. Biochemical Oxygen Demand, mg/l (for 5 days at 20°C)	380	APHA 23rd Ed 5210
7. Chemical Oxygen Demand, mg/l	720	APHA 23rd Ed 5220
8. MPN Fecal Coliform /100 ml	280000 Organisms	IS: 1622 -1981, RA 2019

D.O.R.: 08.02.2021

D.O.C.: 19.02.2021

[Handwritten Signature]
[Handwritten Signature]

AUTHORISED SIGNATORY
EMPLOYEE CODE : (0081)

GC-01(Rev-05)

Page 1 of 1

Scanned copies/photocopies or any other copies should be authenticated by reference to the original report.

Phone : 91-11-27000100, 27667267, 27667860

Fax : 91-11-27667207

SRI-C1 (Rev. 03)

See overleaf for terms & conditions



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

19, University Road, Delhi – 110007 (India)
An ISO - 9001, 14001 & OHSAS 18001 Certified Institute

Website : www.shriraminstitute.org
E-mail id : customercare@shriraminstitute.org

TEST CERTIFICATE

NO. : C1/0000247277

Issued To:

Client Code : A2364
ABSOLUTE WATER PVT. LTD.
M-58, MARKET GREATER KAILASH -II
NEW DELHI
DELHI-110048
Kind Attn:

Date 20/02/2021

Job No. 2102-1-411-1002

Booking No. RG2021/1/9632

Booking Date 08/02/2021

Customer Ref No. EMAIL

Customer Ref Date 05/08/2020

ULR NO. TC544421000002324F



Sample Description :

ONE SAMPLE OF WASTE WATER MARKED AS "STP OUTLET FINAL", LOCATION : DELHI TECHNOLOGICAL UNIVERSITY WAS RECEIVED.

Note: The sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on the declaration by party.

S.No. Test	Result	Protocol
1. pH	7.4	IS: 3025,Pt-11-1983,RA 2017
2. Total Nitrogen (as N), mg/l (TKN-N + NO ₃ -N)	8.3	IS: 3025,Pt-34-1988,RA 2019
3. Total Phosphorous (as P), mg/l	1.6	IS: 3025 Pt-2- 2019
4. Total Suspended Solids, mg/l	12	IS:3025 Pt-17-1984,RA 2017
5. Oil & Grease, mg/l (Detection Limit-0.5mg/l)	Not Detected	APHA 23rd Ed 5520
6. Biochemical Oxygen Demand, mg/l (for 5 days at 20°C)	7	APHA 23rd Ed 5210
7. Chemical Oxygen Demand, mg/l	36	APHA 23rd Ed 5220
8. MPN Fecal Coliform /100 ml	348 Organisms	IS: 1622 -1981, RA 2019

D.O.R.: 08.02.2021

D.O.C.: 20.02.2021

[Signature]
AUTHORISED SIGNATORY
EMPLOYEE CODE : (6081)

GC-01(Rev-05)

Page 1 of 1

Scanned copies/photocopies or any other copies should be authenticated by reference to the original report.

Phone : 91-11-27000100, 27667267, 27667860

Fax : 91-11-27667207

SRI-C1 (Rev. 03)

See overleaf for terms & conditions

Nankana Sahib Education Trust, Ludhiana

Guru Nanak Dev Engineering College, Ludhiana Campus
(An Autonomous College under UGC Act)

No. 483 dated 18-5-2016

Work Order

M/s Absolute Water Pvt. Ltd,
M-58, 2nd Floor,
Market Greater Kailash II,
New Delhi-110048.
Landline: +911129216344, Mobile: +919582252160.

Kind attention: Mr. Ankur Sawhney

Sub: Work order for the construction of 500 kLD STP in the GNDEC campus....

With reference to your offer/tender no. IAC/GNDEC/STP/2016/01 and 02 dated 01/3/2016; IAC/GNDEC/STP/500 kLD/2016/02 dated 24/2/2016 submitted in response to the tender notice published in newspapers dated 02 January, 2016; you are requested to start the construction of the 500 kLD STP in the college campus with following term and conditions.

S. No.	Description of work	Approved cost (In Rs)	Quoted CAPEX (In Rs)	Scheduled time (months)
1	Construction of 500 kLD STP using Biofilters with ozonation as tertiary treatment in the college campus as per the approved drawings, scope of the contract document and other specifications.	155/- lakh plus recurring cost of Rs 60,000/- per month during the operations.	159/- lakh	04

Term and Conditions:

1. **Payment:** Payment will be released as per the provisions of the contract document.
2. You have to sign and submit the contract document along with a letter of acceptance (LoA) and Memorandum of Agreement (MoA) before starting the construction work at the site. The conditions stipulated therein will be binding on you.
3. You have to submit, along with the documents given at Sr. no. 2 above, an earnest money for an amount equivalent to 5% of the approved contract cost in the form of DD favoring Director, Nankana Sahib Education Trust Ludhiana, payable at Ludhiana.
4. You have to complete the project within **04 months** from the date of issue of this work order.
5. Disputes: If any, shall be under the jurisdiction of District Courts of Ludhiana only.
6. Undersigned reserves the right to reject the whole order without assigning any reason.

If these term and conditions are acceptable to you, please start the said construction work at the earliest possible, but not later than **20 June, 2016**.


Director Trust Affair
Director Trust Affairs
Nankana Sahib Education Trust,
(G.N. Eugg. College) Ludhiana

ਨਨਕਾਣਾ ਸਾਹਿਬ ਐਜੂਕੇਸ਼ਨ ਟ੍ਰਸਟ, ਲੁਧਿਆਣਾ

NANKANA SAHIB EDUCATION TRUST

(GURU NANAK DEV ENGINEERING COLLEGE CAMPUS)

Gill Park, Gill Road, LUDHIANA-141006.


Telefax : 0161-2490479

No. 1145

Dated 15-6-2017

To whom it may concern

It is certified that M/s Absolute Water Pvt Ltd, New Delhi has completed 500 kLD STP work in the campus of Guru Nanak Dev Engineering College, Ludhiana as per the scope of the work order no. 483 dated 18/05/2016. The said work was completed by the firm on April 1, 2017.


Director Trust Affairs
Director Trust Affairs
Nankana Sahib Education Trust
(G.N. Engg. College) Ludhiana

DELHI DEVELOPMENT AUTHORITY
ROHINI MAINTENANCE DIVISION NO.-8
SECTOR 14, MADHUBAN CHOWK, DELHI - 85.

No. F 5(4)A/Cs/EE/RMD-8/DDA/2020-21 / 433

Dt. 16/7/2020

To

M/s Absolute Water Pvt. Ltd.
M-58, Second Floor,
M-Block Market,
Greater Kailash-II
New Delhi- 110048

Name of work:- C/o Multi storied DDA Zonal office building at Madhuban Chowk, Rohini.
Sub:- Construction of Green Bio-Filter Sewage treatment plant in Multi storied DDA
Zonal office building at Madhuban Chowk, Rohini.

Dear Sir(s),

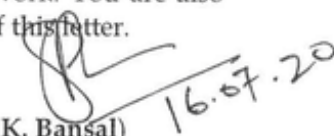
Your percentage rate tender for the above mentioned work has been accepted on behalf of DDA at your tendered rates, terms and conditions given below:-

1.	Estimated Cost	Rs.53,00,664/- (Rupees Fifty three lakhs six hundred sixty four only)
2.	Tendered Amount	Rs.52,47,657/- (Rupees Fifty two lakhs forty seven thousand six hundred fifty seven only)
3.	For the purpose:- Of clause 12:	1.00% (One percent only) below the estimated cost.
4.	Time Allowed	90 (Ninety) Days

You are, therefore, requested to attend the office of the undersigned to sign the formal agreement with a stamp paper (non judicial) worth Rs.50/- within seven days from the date of issue of this letter failing which the acceptance of work in your favour is likely to be withdrawn and the entire amount of Earnest Money deposited by you for this work shall be forfeited absolutely to the DDA.

It may be noted that if any mistake/error in the nomenclature unit rate of the item mentioned in the schedule attached with the tender occur inadvertently you will not be entitled for payment accordingly. The rate unit and nomenclature will be taken as per the provision of the relevant DSR 2018 in minus/plus enhancement for the purpose of payment.

You are also directed to contact the AE-III/RMD-8 at site and start the work at once. Please note that the time allowed for carrying out the work will be reckoned from the 10th day after the date of issue of this letter to commence the work. You are also requested to obtain the project code within five days from the issue of this letter.


(Er. S.K. Bansal) 16.07.20
Executive Engineer(Civil)
Rohini Maint. Divn. No.8



NETAJI SUBHAS UNIVERSITY OF TECHNOLOGY
A State University under Delhi Act 06 of 2018 Govt. of NCT
(FORMERLY NETAJI SUBHAS INSTITUTE OF TECHNOLOGY)
Azad Hind Fauj Marg, Sector-3, Dwarka, New Delhi-110078
Phone No.+91-11-25099055.

No. F. 201(4113)/MDC/E.Cell/2021-22/NSUT/ 1447

Dated: 23/02/2022

M/s Absolute Water Pvt. Ltd.,
M-58, Second Floor, M Block Market,
Greater Kailash-II, New Delhi-110048.
Email: enquiry@absolutewater.in

Name of Work: Designing, Supply, Installation, Testing and Commissioning of 550 KLD Sewage Treatment Plant Based on any Proven Technology (Except Wet Land) at NSUT and thereafter Operation and Comprehensive Maintenance for 12 years.

Dear Sir,

Your tender for the work mentioned above has been accepted on behalf of the Board of Management, NSUT, New Delhi at your tendered amount of Rs. 6,42,13,329/- (Rupees Six Crore Forty Two Lakh Thirteen Thousand Three Hundred Twenty Nine only) which is 3% below the estimated cost of Rs. 6,61,99,308/-.

1. You are requested to submit the performance guarantees in favour of Registrar, NSUT within 07 days of issue of this letter as per detail given below:

Sl. No.	Particulars	Amount (Rs.)	PG Validity Date
1.	SITC of STP (5% of Rs.2,05,30,050)	Rs. 10,26,503.00 (Rs. Ten Lakh Twenty Six Thousand Five Hundred Three only)	30 th June 2023
2.	Operation and comprehensive maintenance of STP for 12 years (5% of Rs. 4,36,83,279.00)	Rs. 21,84,164.00 (Rs. Twenty One Lakh Eighty Four Thousand One Hundred Sixty Four only)	30 th June 2035

The Performance Guarantee shall be in any of the prescribed form as provided in Clause-1 of the General Conditions of Contract for CPWD Works.

- On receipt of prescribed performance guarantee, necessary letter to commence the work shall be issued and site of work shall be handed over to you thereafter.
- Please note that the time allowed for carrying out the work as entered in the tender is **13 Years (SITC of STP: 09 Months Plus 03 Months of Trial Run and Operation & Maintenance of STP: 12 Years)** which will be reckoned after 10 days from the date of issue of this letter.
- The STP to be set up must confirm the technology and other parameters as offered by you in tender.

Yours faithfully,

(PRADEEP DESWAL)
EXECUTIVE ENGINEER (C)

Copy to:

- Income Tax Officer, 206-A, Circle 38 (I), CR Building, I.P. Estate, New Delhi-110002.
- Dy. Labour Commissioner, South West Distt., DTC Colony, Pratap Nagar, Hari Nagar, New Delhi-110064.
- Asstt. Commissioner (W.C.), Room No. 501, Bikrikar Bhawan, New Delhi-110002.
- DR (A/c), NSUT.
- AE (C), NSUT.
- DA, NSUT.
- JE (C)-I, NSUT.
- JE (E), NSUT.
- SSA (Plg.), NSUT.
- AR to VC, NSUT
- PS to Registrar, NSUT.
- Master File.

(PRADEEP DESWAL)
EXECUTIVE ENGINEER (C)

Office of Executive Engineer, Water Supply & Sanitation Division No. 1, Patiala
Phone No. 0175 - 2222617
E-Mail: eewss_gwpta@yahoo.com

To

M/s Absolute Water Private Limited,
M-58, 2nd Floor, M Block Market Greater Kailash II,
New Delhi -110048.
Mobile No.:- 97299-45144

Registered

No: - 4031

Dated: - 07/06/2021

Subject: Allotment of Construction of Main Pumping Station and Clinical Effluent Treatment Plant (350 KLD) based on any suitable sustainable and Proven Technology including O&M of MPS & CETP for 5 years after commissioning in Govt. Rajindra Hospital & Govt. Medical College Complex Patiala.

(Under Deposit Work)
Cost Rs. 1,67,88,091/-

Your tender dated 04.02.2020 have been approved vide Chief Engineer (South), Water Supply & Sanitation Department Punjab, Patiala Letter No. WSS(S-2) 1998 Dated 07.06.2021 and received vide Superintending Engineer, Water Supply & Sanitation Circle, Patiala Endst No. 6270 Dated 07.06.2021. The work is hereby allotted to you for and on behalf of Governor of Punjab at the following rates, terms and conditions subject to the observance of financial rules:-

Sr. No.	CSR Item No.	Description	Qty	Unit	Rate (In Rs.)	In words
1	2	3	4	5	6	7
1	/6.21+4.2(a)	Earth work in excavation in Foundations Trenches etc., for storage and sedimentation tanks, high level tanks, filter	240	Cum	120.00	INR One Hundred & Twenty Only
2	/10.6b(ii)	Cement Concrete 1:8:16 with 40 mm gauge stone aggregate using concrete mixing volumetric type	1	Cum	3127.00	INR Three Thousand One Hundred & Twenty Seven Only
3	/10.7b(ii)	Cement Concrete 1:6:12 with 40 mm gauge stone aggregate using concrete mixing volumetric type	1	Cum	3300.00	INR Three Thousand Three Hundred Only
4	/10.12(ii)	Cement Concrete 1:2:4 with stone ballast or shingle using concrete mixing volumetric type	4	Cum	4800.00	INR Four Thousand Eight Hundred Only
5	/10.17	Reinforced cement concrete M-30 mechanically batch mixed using batch type concrete mixer as per IS: 1791 and vibrated by needle vibrator but excluding steel reinforcement centering and shuttering in superstructure.	25	Cum	6400.00	INR Six Thousand Four Hundred Only
6	/11.6	First class burnt brick work laid in cement sand mortar 1:5 in first storey upto 4 metres above plinth level.	6	Cum	5500.00	INR Five Thousand Five Hundred Only

Office of Executive Engineer, Water Supply & Sanitation Division No. 1, Patiala
Phone No. 0175 - 222617
E-Mail: eewss_gwpta@yahoo.com

To

M/s Absolute Water Private Limited,
M-58, 2nd Floor, M Block Market Greater Kailash II.,
New Delhi-110048.

Registered

No: - 5104

Dated: - 10/07/2020

Subject: ALLOTMENT OF DESIGN, INSTALLATION, CONSTRUCTION AND COMMISSIONING OF PORTABLE PACKAGE TYPE SEWERAGE TREATMENT PLANT OF 50 KLD CAPACITY WITH SUITABLE TECHNOLOGY INCLUDING 12 MONTHS OPERATION AND MAINTENANCE COMPLETE IN ALL RESPECTS AT AERONAUTICAL COLLEGE IN AVIATION C Club, PATIALA.
(UNDER DEPOSTI WORK)
Cost Rs. 51,00,000/-

Your tender dated 04.02.2020 have been approved vide Chief Engineer (South), Water Supply & Sanitation Department Punjab, Patiala Letter No. WSS(S-2) 2543 Dated 26.06.2020 and revised approval after amendments in rates vide Chief Engineer (South), Water Supply & Sanitation Department Punjab, Patiala Letter No. WSS(S-2) 2669 Dated 03.07.2020 and received vide Superintending Engineer, Water Supply & Sanitation Circle, Patiala Endst No. 4764 Dated 03.07.2020. The work is hereby allotted to you for and on behalf of Governor of Punjab at the following rates, terms and conditions subject to the observance of financial rules:-

Sr. No.	CSR Item No.	Description	Qty	Unit	Rate (In Rs.)	In words
1	2	3	4	5	6	7
1	NS	PROVIDING, INSTALLATION AND CONSTRUCTION OF SEWERAGE TREATMENT PLANT OF 50 KLD CAPACITY WITH SUITABLE TECHNOLOGY COMPLETE IN ALL RESPECTS.	1	job	4610000.00	INR Forty Six Lakh Ten Thousand Only
2	NS	OPERATION AND MAINTENANCE AFTER COMPLETION OF WORK FOR 12 MONTHS INCLUDING CUNSUMABLE MATERIAL COMPLETE IN ALL RESPECTS.	1	job	490000.00	INR Four Lakh Ninety Thousand Only

Conditions:-

1. The work will be completed within 6 months from the date of issue of Acceptance letter as per NIT.
2. The above rates are inclusive of Excise Duty, G.S.T, Freight, Transit, Insurance, Charges Loading/ Unloading or any other Taxes etc. complete.
3. The Income Tax, GST, Sale Tax, Labour Cess or any other Admissible Tax as applicable shall be deducted from the bills.

EE Div.No.1 Patiala



Water Management initiative by



DISTRICT ADMINISTRATION
GURUGRAM

Address : Mini Secretariat, Hall No. 01
Raji Chowk, Gurugram
Haryana 122 001

+0124-2331003
gurujal.gurugram@gmail.com
www.gurujal.org

DO No. 139 Gurujal

Dated: 10/09/2019...

Subject – Request for providing Technical Assistance for the construction of 250 KLD Waste Water Treatment Plant (STP) as a pilot for pond rejuvenation under Jal Shakti Abhiyaan in Kasan village of Gurugram District.

This is in reference to the **Water Treatment Expo** that was held on 16th August, 2019 in John Hall, Civil Lines Gurugram under **Support A Pond** initiative of the Gurugram District Administration in lines with district's "GuruJal Society" and Hon'ble Prime Minister's "Jal Shakti Abhiyan" to conserve water in the district.

We would like to share with you that your technology was short-listed by our panel of esteemed experts and officers based on technology, costing and O&M as the criteria. **Absolute Water** had shown great interest in supporting the ponds and helping improve the groundwater levels by providing suitable technologies and supervision and work with Panchayati Raj Institution, Gurugram to address the challenges and meet our objective of rejuvenating water bodies in the district.

And based on your past work experience with Municipal Corporation Gurugram and multiple round of discussions with the committee, we have reached to the conclusion of working with you as our Technical Partners for the construction of 250 KLD Waste Water Treatment Pilot Plant in Kasan. We look forward to engaging with you on this project and making it a success.