

एफ.सं. एस/9/2015-एसबीएम
भारत सरकार
पेयजल एवं स्वच्छता मंत्रालय

12वाँ तल, पर्यावरण भवन,
सीजीओ कॉम्प्लेक्स, लोधी रोड,
नई दिल्ली-110003, 19 जनवरी, 2015
दूरभाष: 011-24363747, फैक्स: 24361062
ईमेल: bala.g@nic.in

सेवा में

प्रधान सचिव/सचिव-सभी राज्य/संघ राज्य क्षेत्र-प्रभारी ग्रामीण स्वच्छता

विषय: एसएलडब्ल्यूएम के लिए तकनीकी विकल्प- डॉ. रघुनाथ माशेलकर कमेटी द्वारा अनुमादित नवीन तकनीक-एनईईआरआई द्वारा विकसित पाइटोरिड तकनीक-एनईईआरआई द्वारा बताई गई पाइटोरिड तकनीक के अनुमोदित लाइसेंसों की सूची के संबंध में।

महोदय/महोदया,

अधोहस्ताक्षरी को सूचित करने का निदेश हुआ है कि एसएलडब्ल्यूएम के लिए तकनीकीय विकल्पों के अतिरिक्त एनईईआरआई (नीरी) द्वारा विकसित पाइटोरिड तकनीक की जल एवं स्वच्छता के क्षेत्र में नवीन तकनीकों के लिए गठित डॉ. रघुनाथ माशेलकर कमेटी द्वारा सिफारिश की गई है। राज्यों से निवेदन है कि एसबीएम (जी) गाइडलाइंस के मापदंडों के अनुसार एसएलडब्ल्यूएम परियोजनाओं के लिए पाइटोरिड तकनीक को अपनाने का विकल्प दें। एनईईआरआई द्वारा अनुमादित पाइटोरिड तकनीकों के लाइसेंसों की सूची और पायटोरिड तकनीक पर नोट इसके साथ सन्दर्भ के लिए संलग्न है।

2. अधोहस्ताक्षरी को इस मंत्रालय के सन्दर्भ सं. डब्ल्यू-11044/1/2012-सीआरएसपी (वोल्.॥) / दिनांक 12/8/2014 (संलग्न) को भी प्रेषित करने का एवं यह कहने का निदेश हुआ है कि डॉ. आर.ए. माशेलकर कमेटी द्वारा डीआडीओ तकनीक के बायोजेस्टर शौचालय की भी सिफारिश की

गई है और अतः राज्यों से एसबीएम (जी) की गाइडलाइंस के अनुसार डीआरडीओ तकनीक के बायोजेस्टर शौचालयों को, जहाँ लागू हों, अपनाने का विकल्प देने का निवेदन किया जाता है।

भवदीय

(जी.बालासुब्रमण्यम)
उप सलाहकार (एसबीएम)

संलग्न:- उपरोक्त अनुसार

प्रतिलिपि:-

1. राज्य समन्वयक एसबीएम (जी), सभी राज्य/संघ राज्य क्षेत्र
2. डॉ. सतीश आर.वटे, निदेशक, एनईईआरआई, नेहरू मार्ग, नागपुर-44020, फोन नं. 0712-2249999
3. श्री लोकेन्द्र सिंह, निदेशक (तकनीकी), डीआरडीओ, डीआरडीओ भवन, नई दिल्ली, फोन नं. -011-23017752
4. संयुक्त सचिव (एसबीएम) / निदेशक (एसबीएम)
5. तक.निदे., एनआईसी को मंत्रालय की वेबसाइट पर डालने के लिए

Project Proposal

on

Natural System Based
PHYTORID Technology for Sewage Treatment
(Changing Sewage to irrigation water)

for Implementation in Rural Areas of India

Submitted to
Ministry of Drinking Water and Sanitation

By



CSIR-National Environmental Engineering Research Institute
Nehru Marg, Nagpur 440020

Phytorid Technology for Treatment of Sewage

CSIR-National Environmental Engineering Research Institute, Nagpur 440020

A huge quantity of sewage is generated in rural and urban areas. With limited installed capacity of treatment in centralised manner, a large portion of this sewage remains untreated and left as it is to water bodies. Currently there is a growing awareness of the impact of sewage contamination on rivers and lakes. In order to rejuvenate the rivers and lakes it is extremely necessary to stop the flow of untreated waste from river basin to the rivers. A large portion of the wastewater is domestic sewage.

In order to make the method feasible selection of technology for sewage treatment should be on criteria such as plant which works without electricity, require minimum maintenance and most importantly, the technology should be self-sustainable. In order to use the technology in rural areas these criteria become more important due to lack of skilled manpower and challenges on electrical supply. This necessitates use of natural methods, which are highly efficient and structured. Using this concept, natural wetland functioning has been used to design a technology wherein wetlands plants and combined working of their root system have been integrated to get a designer ecosystem. National Environmental Engineering Research Institute (NEERI) has developed a novel technology based on natural method of treatment of sewage using constructed wetlands. The technology is named as PHYTORID and is well patented nationally and internationally.

What is PHYTORID system

Engineered wetland system can be used for treatment of wastewater and particularly for treatment of sewage. This is a stand-alone technology and is very effective alternative to conventional activated sludge treatment plants. PHYTORID is a subsurface flow constructed wetland system (SSFCW) with successful demonstration in the field for more than 6 years of continuous operation as a stand alone sewage treatment system.

The porous media also supports the root structure of emergent vegetation. The design of the Phytorid system assumes that the water level in the cells will remain below the top of the filter media. The vegetation to be utilized for the said Phytorid system is very important. Various species of aquatic plants have been utilized to attain maximum efficiency in the treatment of domestic wastes. These include species like Phragmites australis, Phalaris arundinacea, Glyceria maxima, Typha spp., Scirpus spp., other common grasses etc.

Advantages of PHYTORID System

The PHYTORID systems have distinct advantages over conventional treatment plants. The technology is recommended for decentralized plants with varying capacities of 5000 L/day to 8-10 MLD. The best feature of the PHYTORID technology is that there are no mechanical or electrical machineries such as aerators involved. This gives an advantage for sustainable operation of PHYTORID.

Several advantages of PHYTORID are as follows;

- **No mechanical or electrical machineries** such as aerators/pumps are involved therefore very low maintenance (about 10% of Activated Sludge treatment plant or even less as compared to Membrane technology).
- **Space saving** technology as compared to other no-electricity (passive) systems such as Wastewater Stabilization Ponds (WSP). One day residence time for Phytorid as compared to 10-18 days for WSP
- **Scalable** from individual household to community to village/township level
- Decentralized system thereby saving cost on sewage pipelines and avoids loss by leakages
- Treated water quality meets discharge and irrigation standards specified by CPCB. If ozonation (based on solar power) is added then it meets all reuse standards.
- Aesthetic improvements as Phytorid resembles garden (Photo shown below)
- Due to subsurface flow design, no mosquitoes and odor nuisance as compared to some other surface flow technologies
- Systems are able to tolerate fluctuations in flow
- They facilitate water reuse and recycling

- They provide habitat for many wetland organisms
- This is also more desirable in areas with high water table to avoid any contamination of ground water through soak pit
- It can be applied preservation of natural watercourses such as lakes, rivers and marine ecosystem
- It can be easily integrated into the natural topography



Photograph of a PHYTORID based sewage treatment system emphasising aesthetic view of the plant

PHYTORID working in the field

There are about more than 35 PHYTORID systems with varying capacities from 2000 L/day to 1 MLD are working in the field successfully for treatment of sewage. The first ever plant was installed at Mumbai University, Kalina campus in 2006.

The PHYTORID technology owing to its several advantage on technological features and economical basis has a large potential for decentralised treatment of sewage in urban and rural areas of the country with concomitant advantage of water resource conservation.

Table 1: Select list of Phytorid Systems installed.

Sr. No.	Place	Capacity (m ³ /day)
1.	Primer Auto Ltd, Pune	150
2.	Siemens Ltd Kalwa	500
3.	Bharat Forge, Baramati	100
4.	MJP, Nabi Lake Lonar, Maharashtra	500
5.	Mahindra Vehicle Manufactures, Chakan	750
6.	Swapnalok Builders, Pune (under construction)	250
7.	Clover, Vascon Builder, Pune (under construction)	550
8.	Municipal Council, Chandur Railway	100
9.	Municipal Council, Dhamangao	100
10.	Municipal Council, Daryapur	100
11.	Dr. Panjab Rao Deshmukh Krishi Vidyapeeth, Nagpur	100

Performance of PHYTORID**Table 2: Typical Performance of PHYTORID system on inlet and outlet parameters**

Parameter	Inlet (Sewage)	Outlet (treated Water) after Phytorid bed	Outlet after Solar based Ozonation step	Standards as per Environment Protection Rules, 1986	
				Disposal to Inland Surface Water	Disposal on Land for irrigation
BOD (mg/L)	80 to 300	<30	<10	30	100
COD (mg/L)	200 to 600	< 100	<50	250	Not Specified
Total Suspended Solids (ppm)	100 to 500	< 100	<30	100	200
Ammonia as NH ₃ (ppm)	5 to 20	< 5.0	<5.0	5.0	Not Specified
Phosphate	10 to 50	< 5.0	< 5.0	5.0	Not Specified
pH	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5-9.0	5.5-9.0
Colour	Black/dark	Colourless	Colourless	Colourless	Colourless
Fecal Coli Farm (MNP/100ml)	10 ⁶ to 10 ⁷	<500	Nil	<500	<500

Space Requirement

As seen from the above photographs phytorid can be integrated into the landscape and therefore no dedicated space is required. However, the total area required for Phytorid treatment plant for a capacity of 100 m³/day is approximately 150 m². The area does not include amenities, approach and other needs for maintenance, which could be an additional 10-20%. Based on the land availability and shape of the land, design can also be changed. If one or two pumps are used then tanks can be built in multiple levels and space can be saved.

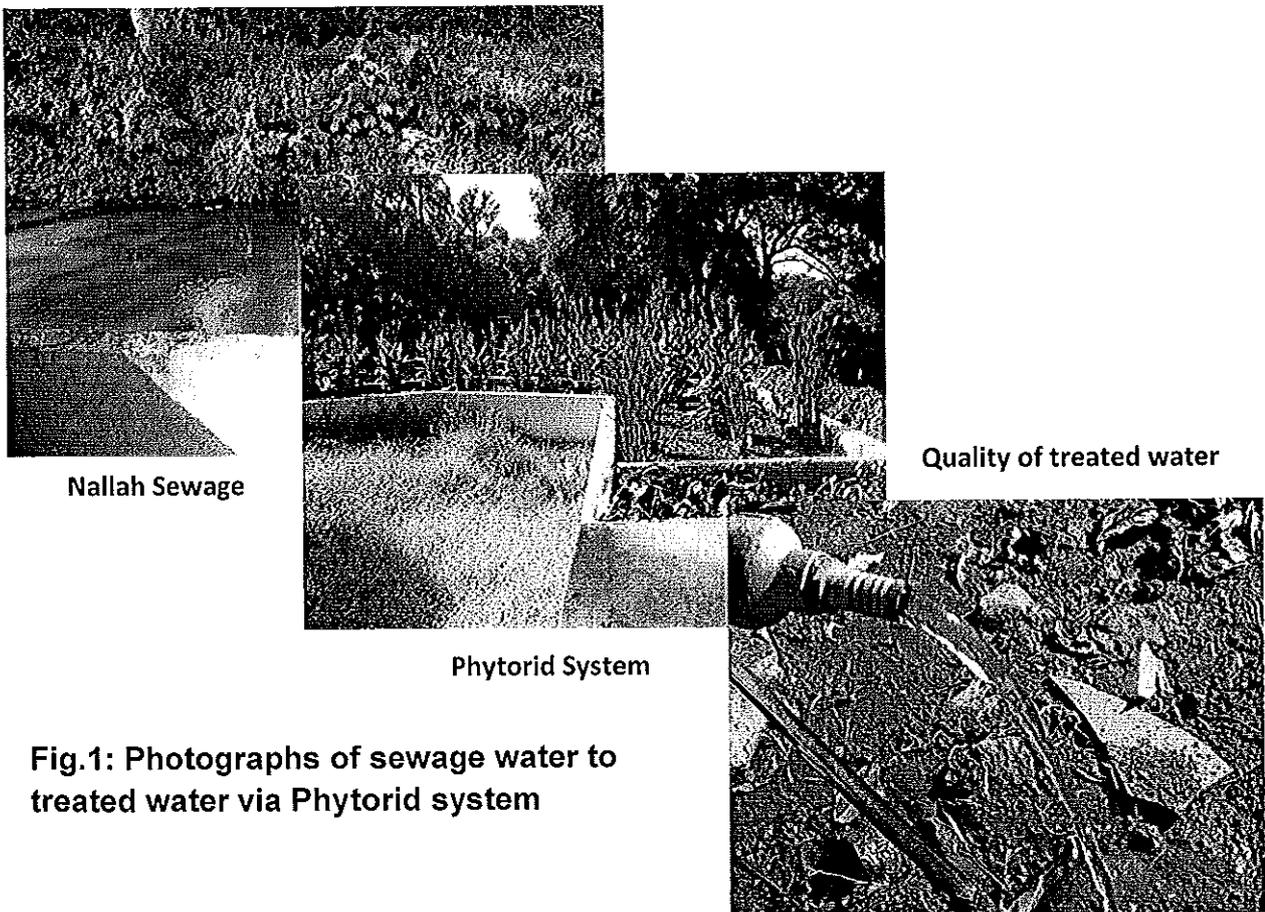


Fig.1: Photographs of sewage water to treated water via Phytorid system

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Operation & Maintenance Schedule for Phytorid plant

Although no elaborate maintenance is required as compared to mechanised plants following operation and maintenance is required.

Periods in Months	1	2	3	4	5	6	7	8	9	10	11	12
O & M item												
Replantation (partial if needed)			0									0
Water Quality analysis	0	0	0		0		0		0			0
Cleaning of Screening Chamber [this could be every week, in case load of floating matter is high]	0	0	0	0	0	0	0	0	0	0	0	0
Harvesting of overgrown plants and roots			0			0			0			0
Hydraulics/ water level Checks						0						0
Cleaning of Settling chamber												0
Gravel checks and reshuffle						0						0
Pump maintenance (if pump is installed)			0			0			0			0
Biomeida augmentation (10% of the first time addition)												0

Applications of PHYTORID

The PHYTORID technology is best applicable to following;

- Domestic municipal sewage treatment
- Nallah water treatment
- Improving the lake water quality
- Industrial waste water particularly textile, dairy, food etc.

Capacity dependent Cost of PHYTORID

Phytorid system is a cost effective option for treatment of sewage from domestic sources. The installation cost of the complete system depends on the capacity of the plant. A variation in the cost of installation, maintenance cost of sewage treatment and space required is shown in the following table;

Population (with LPCD of 70)	Capacities, m ³ /day	Civil costs# (for typical design)	Solar pumps* , pipes, etc	Bio-media Culture costs	Plantation costs	Annual Maintenance charges	NEERI's charges	Total Cost (Rs.)	Land Requirement (Sq.m)
500	25	1141334	50000	58800	11116	72000	50000	13,83,250	30
600	35	1335135	50000	70560	13339	100800	50000	16,19,834	42
700	40	1506895	50000	82320	15562	115200	50000	18,19,977	48
800	45	1700740	50000	94080	17786	129600	50000	20,42,206	54
900	50	1872250	50000	105840	20009	144000	50000	22,42,099	60
1000	55	2066050	50000	117600	22232	158400	50000	24,64,282	66
1200	65	2437993	50000	141120	26678	187200	50000	28,92,991	78
1400	75	2798758	50000	164640	31125	216000	50000	33,10,523	90
1600	90	3164069	50000	188160	35571	259200	50000	37,47,000	108
1800	100	3536056	50000	211680	40018	288000	50000	41,75,754	120
2000	112	3901367	50000	235200	44464	322560	50000	46,03,591	134

List of Licenses of Phytorid Technology

Sr. No	Name of Licensee and address	Date of Technology Transfer	Contact details
1	Shri Pradeep T. Tayade General Techno services 203, Sneha Ashish Apartment, Morivali Village, B Cabin Road, Near Motiram Park <u>Ambarnath East - 421 501</u> (Dist. Thane)	March 9, 2009	Tel:- 0251-2520763 Mobile:- 9323828277 Email:- generaltech@rediffmail.com
2	Dr. Ajay Ojha Partner Technogreen Environmental Solutions 101, Hem Opal, Plot No.26, Ekta Society Wakdewadi Pune - 411 003	Feb. 12, 2010	Tel:- 020-65002135 Fax:- 020-25822426 Email:- technogreen@rediffmail.com technogreen@vsnl.net Web:- www.technogreen.net
3	Shri Satish B. Rehpade Go Green Solutions Pvt. Ltd. Samarth Nagar West Wardha Road, Ajni Squa Nagpur- 440 015	July 27, 2009	Tel:- 0712-2250021,2252597 Fax:- 0712-2252597 Mobile:- 9373108518 Email:- info@gogreensol.com
4	Mrs. Shubhada P. Pathak Proprietor Devi Agencies 19, Sahayog Nagar, Ulka Nagari, Garkheda Parisar <u>Aurangabad - 431 001</u>	Jan. 06, 2011	Tel:- 0240-2332787 0240-2348347 Fax:-0240-2332787 Email:- devi_agencies@yahoo.co.in devipsp_agd@bsnl.in
5	Mrs. Sarvada Joshi Proprietor M/s BIOUMA DS-1, Vasudev Nagar Muslimwada, Bicholim C/o M/s Pharmaids & Equipments, S/2 IInd Floor, Vasudev Archade <u>Bicholim, Goa - 403 504</u>	Feb. 21, 2011	Tel/Fax:- 0832-2363787 Mobile:- 9225905745(Ajit Joshi) Email:- accounts@pharmaids.co.in
6	Shri Sachhidanand Sahasrabuddhe Partner Crest Enviro Transformation India Pvt. Ltd. "Suchindram", 5 B,Shikshak Nagar Society, Opp. Vanaz Company, Paramahancenagar, Paud Road, Kothrud <u>Pune - 411 038</u>	Sept. 20, 2011	Mobile:- 9545979899 Email:- s_sachhidanand@hotmail.com

Handwritten signature
14/11

7	Shri P.K. Paranjape Quality Sales Agency 6, Ashirwad, Canal Road Ramdaspath Nagpur – 440 010	Nov. 9, 2011	Tel:- 0712-2545047(O) Mobile:- 09822710606 Email:- pkparanjape@rediffmail.com pkparanjape@hotmail.com
8	Shri P.V. Swaminathan(M.D)/ Sriram. N. Swamy (Jt. M.D) Centron Aqua Engineering Pvt. Ltd. 14, North Ambazari Road, Shivaji Nagar Nagpur – 411 010	Nov. 18, 2011	Tel/Fax:- 0712-2247250 Mobile:- 9850385990 (PVS) 9552827810 (SNS) Email:- centronaqua@yahoo.com
9	Shri Sarang Sadhu S. S. Marketing Co. 19, Hindustan Colony, Opp. Sai Mandir, Wardha Road Nagpur	December 20, 2011	Mobile : 093701599 / 09850386746 Email:- sadhhu.sarang@rediffmail.com
10	Shri Radhesham Mopalwar Member Secretary Maharashtra Jeevan Pradhikaran 4th floor, Express Towers Nariman Point Mumbai – 400 021	February 17, 2012	Email : ee.meetra@mjp.gov.in senrtc@yahoo.co.in senrtc@rediffmail.com Nasik: 02532462512 Fax: 02532464436
11	Rakendra Kumar Mishra 1 st floor, F-182, Gali no.3, Padavnagar, Mayur vihar-I, New Delhi-110091	July 24, 2012	rakendramishra@hydrocreativ es.com 9818003337
12	Mr. Mahendra Mulkalwar MM ENVIRO Projects Pvt. Ltd. First floor Akanksha Arcade, KDK College Road, Nandanvan, Nagpur – 440 009	July 25, 2012	Tel 0712- 2714960 Fax – 0712- 271968 mmenviro@gmail.com www.mmenviro.com
13	Mr. Alok Prasad Alaknanda Technologies K-3, Krishna Ganga, Din Dayal Road, Opp. Post Office, Vishnu Nagar,Dombivali (W), Thane – 421 202	August 13, 2012	info@alaknandatech.com, sales@alaknandatech.com www.alaknandatech.com 0251-3232842 0990461282
14	Mr. Manoj Patil Director S M Polymers 204, 2nd floor, mohan Mahal, Nr. Vanadan Theatre, LBS Marg Thane - 400 602	August 13, 2013	Tel : 02225394936 Fax: 02225368908 Mobile : 9223485635 / 9223485640 smpolymer@gmail.com www.chlorinatorindia.com
15	Dr. Rajesh Biniwale Partner Director M/s Ecologique Science Technik (India) Pvt. Ltd. Plot No. 39, Agne Layout Nagpur – 440 022	April 24, 2014	Mobile: 09822745768 director@estpl.co.in ecologique.india@gmail.com rajeshbinivale@gmail.com

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14/11

No W.11044/1/2012-CRSP (Vol. II)
Government of India
Ministry of Drinking Water and Sanitation
NBA Division

12th Floor, Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi – 110003
Date: 12.8.2014

To,
The Principal Secretary / Secretary,
In charge Rural Sanitation, All States/UTs
Subject: Regarding implementation of DRDO Bio-digester toilets

Sir/Madam,

I am directed to intimate that an MOU (Memorandum of Understanding) between Ministry of Drinking Water and Sanitation (MODW&S) and Defence Research & Development Organization (DRDO) for "Implementation of Bio-digesters/Bio-tank Toilets" was signed on 26.7.2012, for promoting the use of this technology in providing sanitation services in rural areas. Following decisions taken in this regard are brought to the notice of all States/UTs:

- i. States may be given the option for adopting the DRDO model of a complete toilet unit including the bio-digester tank and the super-structure, or only the bio-digester tank with a brick-mortar super-structure.
- ii. Nirmal Bharat Abhiyan (NBA) guidelines shall form the basis for the projects including the financial incentive that would be the same for the bio-digester toilets as provided for in the NBA guidelines. Additional cost over and above that fixed under NBA guidelines plus that allowed under MNREGS would be met by the State Governments.

The following are enclosed:

- (a) Note on Bio-digester Technology
- (b) Note on comparison between Bio-digester and conventional septic tank
- (c) List of TOT holders

Encl; As above

Yours faithfully,

(Christina Kujur)
Under Secretary (NBA)

Copy to :

- i. State Coordinator, NBA, All States/UTs
- ii. Shri Lokendra Singh, Director (Technical) DRDO, DRDO Bhavan, New Delhi
Phone; 011-23017752
- ✓ iii. Technical Director, NIC, MODW&S for placing in Ministry's web-site

List of the TOT holders for Stationery Bio-digester (Plain Areas)

SNo	Name and Address of Firms	Contact Details
1.	HindustanMetal Industries Sh RadheshBjawan, OppShujabadBhawan, NaiSarak, Gwalior-474001	CP:Mr Ashok K. Hayaran, GM Ph: 0751-2627140, 2627295 Fax: 0751-2327492 Email: hmlgwr@sancharnet.in
2.	Flotech Engineering and Trading Services 47, SunkadaKatte, Magadi Road, Bangalore	CP:Mr M.C. Shyamsukha, CE
3.	Alfa Therm Limited 6, Community Centre, Mayapuri, Phase-I, New Delhi – 110064	CP: MrHarjot Singh Chatha Tel. No: 011-28115222, 28116222 Mob: 9810060029 Fax No.: 011-28115396 Email.: alfatherm@vsnl.com; harjot@alfatherm.in
4.	S.B. Equipments 309 Durga Chambers, 1333 D.B. Gupta Road, Karol Bagh New Delhi – 110005	CP: Kamal Goyal Tel. No.: 011-28754365/ 8905 Mob: 9891088850 Fax:011-22485572 Email: gylkamal@rediffmail.com;sbequip ment@rediffmail.com
5.	Mohan Rail Components (P) Ltd., Opp. Rail Coach Factory, Hussainpur,Kapurthala– 144602	CP : Amandeep Singh (Dir- Operations) Tel. No.: 01822– 506763; Fax No.: 01822–227311 Mob.: 09876740403 Email: aman@mrcpl.com Web:http://mrcpl.com
6.	Thakar Equipment Company 66, Okhla Industrial Estate, (Phase- II), New Delhi –20	CP: Madhu S Thakar Tel. No. 011-26847280, 26820723 Mob: 9810078028 Fax No. 011-26827232. Email: admin@thakareqpt.com; msthakar@airtelmail.in Web: www.thakareqpt.com
7.	Omax Autos Limited Plot No.-26, (4 Bays), Institutional Area, Sector-32,F Gurgaon – 122001 (HR).	Ph. 0124-403250505 Fax No.: 0124-2580016/ 4032506
8.	Escorts Limited , 11, Scindia House, Connaught Circus, New Delhi -110001.	CP: Vinod Mishra Tel. No.: 011-2293235, 4193235, 2284623 Fax No.: 0129-2232148, 2283069 Mob.: 09818845516, 09650544611

SNo	Name and Address of Firms	Contact Details
9.	CBS Technologies Pvt. Ltd. 48-C, Pocket-C (HIG) SFS Flats, SFS Flats, MayurVihar, Phase-III, Delhi – 110096.	Shri Sanjay K. Agarwal, GMD Mob. 09350536534 Tel. No.: 011 – 23524833, 22613408 Fax No.: 011 – 22360733, 22613362 Mobile: 9350536534 Email: cbs.director1@gmail.com; cbstechnologment.com; cbsenergy@gmail.com Web: www.cbsenergy.com
10.	Rail Tech 5625, Qutab Road, New Delhi -110055	CP : Mr. Kunal Jain Mob: 9810499839 Ph: 011-23610733/23524833 Fax: 23610733 Email:kunal.jain@railtechindia.c om; railtech@railtechindia.com Web: www.railtechindia.com
11.	Pushpa Enterprises, A-5/24 Pasheim Vihar New Delhi – 110063.	CP: G.C. Gupta (Proprieter) Ph: 011-25286550 Mobile:9312173313,9811012792, 9811012793 Email:sanju5sanam@yahoo.co.in
12.	Samudra Shipyard (P) Ltd., PB No. 10 Chemical Industrial Estate, Arroor-688534(Kerala)	CP: Dr. SudhakaranJeevan, (Chairman & CEO) Phone: 4782874027, 2873927, 2875279 Fax:0478-2872942, 2873466
13.	Alfa System & Services, E-19-C, Sector 8,Noida- 201301 UP	CP: MrAdhirKhanna Phone: 0120-4574871-74 Mob:9810149545 Fax : 0120-4574873 Email: alfa@alfaairtech.com Web: www.alfaairtech.com
14.	Shree Ram Raja Wood Packers, 905-906, Silver, Estate, University Road, Gwalior-474009	CP: Mr Mahesh Agrawal , Proprieter Mob : 9301107052; 9229204910 Fax: 0751-4011811
15.	Go Green Solution Pvt., Ltd., 1, Samarth Nagar (w), Ajni Sq., Wardha Road, Nagpur – 15.	CP: Mr. SatishRehpade Tel. No: 0712-2250021 Fax: 0712-2252597 Mob.: 09975032331 E-Mail: info@gogreensol.com Web site: www.gogreensol.com

SNo	Name and Address of Firms	Contact Details
16.	Anjana Steel Industries Pvt., Ltd., Dhiringa More, NH-2 Delhi Road, Baidyabati, Distt.-Hoogly (WB)	CP:MrPawanDhanuka CEO Phone: 033-22264688/89/90 : 033-26324103 Fax: 033 4006 2785 Email: advd@adelectrosteel.net
17.	E-Pack Polymers, 2584 Rohatgi Mansion, 2nd Floor, Hamilton Road, Delhi-110006	CP: Col Harpreet Singh Sethi Ph: 011 23916882 Fax: 011 23953687 Mobile: 9818666038
18.	Super Flow Engg. Corp., Parking No.1, Transport Nagar, Gwalior	CP:Baljeet Singh Rana, Ph: 0751-4070318 Fax: 0751-4076318 Mob: 9827008027, 9229231711 Email: superflow97@gmail.com Web: www.sfecorporation.com
19.	MaanEnviro Technologies, Plot No.38-39 MangalmurtiNaulakha Sq. Nemawar Road, Indore	CP: Manish Goyal, CEO Ph: 0731-2405888 Mob:9425937636;9406622388 Email: info@maanenviro.com
20.	Banka Enterprises A-111, Express Apartment, Lakdi-Ka-Pool, Hyderabad – 500004.	CP:Mrs. Namita Banka Fax. No. : 040-66688028 Mobile: 09246880060
21.	Besco Limited (Foundry Division) 7 th Floor, Poonam, 5/2 Russel Street, Kolkata – 700071	CP: V S Pandey, AGM (Marketing) Ph: 033-23766421; 033- 22276784, 22263964 Mob: 9899125178 Email: besco_limited@hotmail.com Fax: 033-22261406
22.	Arkin Creations Pvt Ltd H-127, 1st Floor, Residency Greens, Greenwood City, South City-1, Gurgaon-122001	CP: ShManojJha, MD Ph:09650682111, Mob:09818432020 Email:arkincreations@gmail.com Web: www.arkin.org.in
23.	Real India LifetechPvt Ltd Vasanth Chambers, Pent House, 5-10-17, NatchMaidan Road, Basheerbagh, Hyderabad	CP: DrShesheer Kumar, Director Mob: 9704567315
24.	Vibh Composite Works Yamuna Nagar-135001 (Haryana)	CP: MrVivek Gupta, MD Mob: 9812021442
25.	SVK Tech Pvt Ltd B-121, Green Avenue, Sector-71, Noida-201303	CP: MrPrashant Kumar, Director Ph: 0120-2484101-105 Fax: 0120-2484107 Mob: 9811041529

SNo	Name and Address of Firms	Contact Details
26.	BSA Corporation Limited, Gat No. 2329, A/1, S No279,281,287, Wagholi, Pune, Maharashtra-412207	CP: MrBalasahebKadam, MD Mob: 9890186671, 9011080601
27.	Century Pharmaceuticals Ltd 406, World Trade Center, Sayajiganj, Vadodara- 390005	CP: MrJanak Seth, MD Ph: 0265-2361581/ 2361978/2362509 Fax: 0265-2226023
28.	Srikar Organics India Ltd Plot No 24, Near Chandamama hospital, Raghavendra Nagar, Nacharam, Hyderabad	CP: DrLingaSrinivasaRao, Chairman & MD Ph: 08008801951, 08008001858
29.	Eram Scientific Solutions (P) Ltd TC 9/1615, SRHM Road, Sasthamangalam, Trivandrum- 695010	CP: Mr MS vinod, Exec. Director Ph: 0471-4062125 Mob: 9947122277
30.	SujayEnvirotech India Pvt Ltd C-840, Sumati Apartment, Near Shaniwarwada, ShaniwarPeth, Pune-30	CP: MrJayeshKantilalPhulphagar, MD Mob: 9011014444
31.	Mars Equipments Limited, India 28-A, VidhanSabhamarg, Burlington Xing, lucknow 226001(U.P), India	CP: Mr B N Tiwari, Director Ph: 0522-2418516 Fax: 0522-2418516 Mob: 9415510000
32.	Khandelwal Enterprises 18, Dhamani Market, Chaura Rasta, Jaipur-302113	CP: MR Deepak Khandelwal, Proprietor Mob: 9829013228 Email: khandelwalenterprises@rediffmail .com
33.	Waterlife India Private Limited Plot No 9, SAINIDHI, 2 nd Floor, Krishnapuri Colony, West Marredpally, Secunerabad- 500026	CP: MrSudeshMenon, MD Ph: 040-27709889, 67292193 Fax: 040-27709889
34.	Ultra Dimensions Pvt Ltd #14-1-42, Ground Floor, Pragati's Regent, Nowroji Road, Maharanipeta, Vishakhapatnam- 530002	CP:Mr LG trinadhaRao, Chairman & MD Ph: 0891-2505441, 2562490, 2529927 Fax: 0891-2714391
35.	MAK India Ltd 7/41-B, Avinashi Road, Coimbatore-641014	CP: MrManickamGounder, Chairman & MD Ph: 0422-4305000 Fax: 0422-4305060 Mob: 9994798884

SNo	Name and Address of Firms	Contact Details
36.	Bhilai Engineering Corporation Ltd Hathkoj Village, Industrial Area, Bhilai-490026, Distt- Durg, Chhattisgarh	CP: MrAvdhesh Kumar Mathur, Asst Manager (Marketing) Ph: 0788-4088100 Fax: 0788-2285499,2381140 E-mail: becinfo@bec-group.com Web: www.bec-group.com
37.	Frontier Sales Corporation Bamunimaidan Industrial Estate, 1 st Bye-Lane, Opp. BhogaliJalpan, Guwahati-781004	CP: Mr Sunil Kathotia, Proprietor Ph: 0361-2655499 Mob: 9435010287
38.	Wahi Sons Pvt Ltd D5 Pushpanjali Farms, Bijwasan New Delhi-110061	CP: MrGautam Jain Ph: 0124-4340400 Mob: 9899859933
39.	Grandeur Business Solutions Pvt Ltd., D-228, Sarvodaya Enclave, Near IIT, Opposite Mother's International School, New Delhi- 110017	Mob: 9871405752 9810137440