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**TECHNOLOGY MISSION ON DRINKING WATER IN VILLAGES  
AND RELATED WATER MANAGEMENT**

**Report on Regional Camp on Iron Removal at Mirzapur  
November 25-27, 1987**



**NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE**

**Nehru Marg, NAGPUR - 440020**

**JANUARY 1988**

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**REPORT**

**ON**

**Regional Camp on Iron Removal**

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## INTRODUCTION

National Environmental Engineering Research Institute (NEERI) under the Council of Scientific and Industrial Research has been identified to impart training and technology awareness under 'Technology Mission on Drinking Water in Villages and Related Water Management', so as to ensure the availability of an adequate quantity of drinking water of acceptable quality. The technologies entrusted to NEERI in recognition of its R and D experiences include iron removal, defluoridation, disinfection, surface water treatment and slow sand filtration. The training of the personnel and demonstration of these technologies have been considered as an essential part of technology awareness in masses.

Iron is an essential element in both plant and animal metabolism, and influenced by its concentration and forms of iron dissolved in natural water. Ferrous carbonate and ferrous sulphide are important iron minerals whose solubility is pH dependent. Under favourable conditions, common iron bearing minerals may be attacked by water, and enough iron thus may get dissolved, to be troublesome to the water users.

States of Orissa, Bihar, Assam, West Bengal, Madhya Pradesh, Meghalaya, Tripura, Maharashtra, Kerala and Tamilnadu have been found to have ground waters contaminated with varying concentrations of iron which requires

appropriate treatment for its removal. All waters whose iron concentration exceed 1 mg/L need suitable treatment for its removal.

Mirzapur district in UP state was identified for iron problem. The hand pump water from certain part of the district contains iron in excessive limit which needs appropriate treatment to make it potable. NEERI scientists visited Mirzapur and carried out water quality assessment of problem villages to identify high concentration of iron in hand pump water for installation of Iron Removal Plants for hand pump connection. In the follow up interaction with Engineer in Chief, U.P. Jal Nigam Lucknow,, it was proposed to hold a regional camp on Iron Removal at Mirzapur during 25-27 November, 1987, under the joint auspices of NEERI and U.P. Jal Nigam Mirzapur.

#### OBJECTIVES

Iron in drinking water is not desired since it causes aesthetic problems, metallic taste, colour and turbidity after storage. It reduces the carrying capacity of pipe and stains utensils and clothes. Iron Removal Technology is well established and understood. The policy of NEERI is that when its technologies are demonstrated, there should be a gathering of concerned water supply engineers for proper exchange of information at various levels. The major objectives of the training camp are :

- i) To appraise the procedures for sample collection.
- ii) To conduct spot tests to identify dissolved iron with the assistance of NEERI- Iron Determination Field Kit.
- iii) To familiarize the participants with the various designs available with NEERI on iron removal, and to arrive at an optimum system for iron removal for a particular situation.
- iv) To install Demonstration Iron Removal Plants and to make the participants study their performances.
- v) To create awareness among the local public and to ensure their participation during demonstration of Iron Removal Plants.

#### VENUE OF THE CAMP - MIRZAPUR :

Iron removal field camp has to be held at a place where the ground water contains iron causing problems to the public and the engineers. Mirzapur is suitable for the camp in view of its most of the areas of ground water with excessive quantities of dissolved iron.

#### PREPARATION FOR THE CAMP :

NEERI scientists attended WTM meeting at Mirzapur during November 1986, arranged by state Govt., U.P. Jal

Nigam. During this period, NEERI scientists visited Jagdishpur, Dadra and other places and studied water quality of 5-6 hand pumps and found iron concentration up to 5 ppm

Shri R.C. Dixit, Scientist, Delhi Zonal Laboratory has carried out Water Quality Assessment of 13 hand pumps during 25 - 29 August 1987 for parameters pH, conductivity, alkalinity, hardness, iron and manganese. The results are shown in Table 1.

A meeting was held with Engineer-in-Chief U.P. Jal Nigam Lucknow and NEERI scientists on 25th August, 1987 at Lucknow regarding Iron Removal Camp which was to be held at Mirzapur during November 1987. NEERI scientists visited Mirzapur to plan the camp particulars with U.P. Jal Nigam Mirzapur and to select the site for installation of Iron Removal Plants. During the visit, NEERI scientist agreed to install two Iron Removal Plants at village Dadra. One plant was decided to be installed at the hand pump located in the premises of Block Development Office (BDO) Campus and another plant on road side hand pump. Two Iron Removal Plants each of 0.3m<sup>3</sup>/h capacity were fabricated in NEERI workshop out of M.S. and galvanised sheet. All the camp training materials, demonstration plants, glassware and chemicals were sent by team for proper installation of the plants. The progress of the installation of the NEERI iron removal plants at Dadra village in Mirzapur was monitored by visiting NEERI scientists, in order that the installation could be over in time.

A NEERI team comprising of four scientists reached Mirzapur on November 21st, 1987. Iron Removal Plants and other materials were received on 23.11.87 at Mirzapur. After receiving the plants, they were taken to the site for installation. Other materials like stone chips, marble chips, hose pipe etc. required for installation purposes were collected from the market. U.P. Jal Nigam Mirzapur, raised the pump height by 2-3 feet and constructed the platform for installation of plants.

Participants: All the engineers from U.P. Jal Nigam Mirzapur including S.E. and his subordinate staff, participated in the camp.

Faculty : The faculty mainly comprised of scientists and an engineer from NEERI. Apart from classroom lectures and design exercises, the participants were taken to the villages of Marihan block for spot evaluation of the hand pump water quality at three locations.

#### CAMP PROGRAMME

— This included training, spot water quality evaluation, installation of Iron Removal Plant, plant evaluation and its demonstration.



## TRAINING

All the engineers of U. P. Jal Nigam working in Mirzapur district participated in the camp. The folders containing packages on defluoridation, iron removal, slow sand filtration, etc. were given to the participants. Dr. V.P. Thergaonkar gave an introductory talk on water quality assessment and interpretation of water quality test results. Mr. V.P. Deshpande gave the lecture on the design aspects of the Iron Removal Plants for small communities. A field design problem for Iron Removal Plants for capacities of 300 to 5000 population, was dealt with in detail. A talk on Iron Removal Technology developed by NEERI (Nagpur) was given by Mrs. M.V. Vaidya. The importance and the operation of the Iron Removal Plants was explained to the BDO staff in the local language. This has created awareness in the people. Water analysis was explained by Mr. A.M. Deshkar.

A video film consisting of important activities carried out by NEERI on iron removal, defluoridation, slow sand filtration, disinfection, water quality etc. was shown to the participants of Mirzapur.

## SPOT WATER QUALITY ASSESSMENT

NEERI faculty along with all the participants, visited villages in block Madihan and Rajgarh, which are having excessive iron problem in hand pump waters. Practical demonstration of sampling from hand pump and estimation of

parameters pH, free dissolved carbondioxide, dissolved iron etc.was given at the spot with help of Field Testing Kits. Results are shown in the Table 2.

#### INSTALLATION AND COMMISSION OF IRON REMOVAL PLANT

Iron Removal Plant was installed by NEERI scientists Mrs. M.V. Vaidya and A.M. Deshkar on hand pump located in Block Campus at Dadra. The U.P. Jal Nigam raised the height of hand pump by 2-3 feet for feeding the pump water to the plant under gravity. The plant was operated continuously for 12 hours by engaging two labourers for curing the aeration media, after commissioning the plant.

#### PERFORMANCE EVALUATION OF THE IRON REMOVAL PLANT

The plant was evaluated for its iron removal capacity. The plant was run continuously and hourly samples were collected from hand pump (raw water), after aeration in tray aerators, settling tank and delivery tap of the plant. The samples were analysed for pH, CO<sub>2</sub>, dissolved oxygen and iron concentration. The plant could not run beyond 3<sup>1</sup>/<sub>2</sub> hours as hand pump water was exhausted. In all samples from delivery tap of the plant the iron concentration was observed to be nil. The results of the plant evaluation studies are given in Table 2. This shows that the plant gave excellent performance with respect to removal of iron from hand pump water. The iron concentration in hand pump water varied between 10 & 7 mg/L.

### DEMONSTRATION OF IRON REMOVAL PLANT

The Iron Removal Plant was demonstrated by the faculty to the participants, ADM, BDO, Health Officer and nearby villagers for its working performance and estimation of water quality parameters. The participants took the samples of raw water and treated water and estimated the iron concentration. The participants were pleased to observe absence of iron in treated water from raw water initial concentration of 8 mg/L.

### ACKNOWLEDGEMENT

NEERI would like to acknowledge the Block Development Officer (BDO); ADM; Village Mukhiya and Mr. Singh, a local Patrakar who had shown keen interest in the iron removal plant and encouragement towards the technology. NEERI would also like to acknowledge the U.P. Jal Nigam staff for extending cooperation during the camp period.

TABLE I

PHYSICO-CHEMICAL CHARACTERISTICS OF WATER FROM  
HANDPUMPS MARK II : MIRZAPUR, U.P.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Village	Mirzapur	Mirzapur	Rajapur	Pachokhara	Dadra	Bhulikhas	Hansipur	Madungary	Bhulikhas	Bhulikhas	Rajgarh	Dadra	Dadra Behind
									Near Masjid	Sr. Basic	Pri. Hel.	Main Road	Block Office
									Vidyalaya	Centre			
Block	Halia	Halia	Halia	Rajgarh	Rajgarh	Rajgarh	Seekar	Bhulikhas	Bhulikhas	Bhulikhas	Rajgarh	Dadra	Dadra
Tehsil	Mirzapur	Mirzapur	Mirzapur	Chunar	Chunar	Chunar	Chunar	Mirzapur	Mirzapur	Mirzapur	Mirzapur	Mirzapur	Mirzapur
Source	H.P. Mark II	Kacheba	H.P. Mark II	H.P. Mark II	H.P. Mark II	H.P. Mark II	H.P. Mark II	Handpump	Handpump	Handpump	Handpump	Handpump	Handpump
		Openwell											
Date of Collection	5/6/87	5/6/87	5/6/87	6/6/87	6/6/87	6/6/87	6/6/87	27/8/87	27/8/87	27/8/87	27/8/87	27/8/87	28/8/87
pH	6.4	6.8	6.8	6.7	6.3	6.6	7.2	6.2	7.0	6.2	6.6	6.2	6.4
Alkalinity as CaCO <sub>3</sub> mg/l	120	124	496	308	180	140	428	160	372	26	168	40	110
Total Hardness as CaCO <sub>3</sub> , mg/l	112	112	348	280	172	132	380	268	544	40	152	52	152
Calcium Hardness as CaCO <sub>3</sub> , mg/l	72	88	220	216	126	104	248	180	360	26	132	24	108
Conductivity us/cms	280	250	875	600	400	290	710	680	1200	135	350	135	525
Total Iron mg/l	13.6	0.2	0.48	2.48	9.2	6.0	3.0	0.80	0.84	2.2	2.32	2.80	3.20
Ferrous Iron mg/l	3.2	Traces	0.24	0.4	3.2	1.2	2.8	0.80	0.80	1.32	1.04	2.68	2.40
Total Manganese mg/l	Traces	Nil	Nil	Nil	Traces	Traces	Traces	Traces	Nil	Traces	Nil	Traces	Traces

TABLE 2

Spot Analysis of Raw Water Samples

Village	Block	pH	CO <sub>2</sub>	Fe
Kalwari Khurd	Marihan	6.2	40 mg/L	1.0-1.5 mg/L
Kalwari Mafi	Rajgarh	6.4	185 mg/L	3-4 "
Koflosa gheosaram	-	6.8	70 mg/L	2-3 "

**TABLE 3 Performance Evaluation of the Iron Removal Plant installed at Dadra  
(Based on the Iron Removal Technology Developed by NEERI)**

	I				II			III			IV		
	Raw Water (hand pump)				After Aeration from tray Aerators			Effluent from Settling chamber			Delivery tap of the plant (Treated water)		
Sampling hours	0	1	2	3	1	2	3	1	2	3	1	2	3
pH	6.8	6.8	6.7	6.8							7.3	7.3	7.2
CO <sub>2</sub> mg/L	64	64	65	63							4	5	5
DO mg/L	0.5	0.5	0.5	0.5	7.5	7.2	7.3	6.0	6.2	6.3	6	6.2	6.3
Fe mg/L	10	10	9	7.5							0	0	0

ANNEXURE I

NEERI FACULTY

1. Dr. V.P. Thergaonkar
2. Mrs.M.V. Vaidya
3. Shri V.P. Deshpande
4. Shri A.M. Deshkar

## ANNEXURE II

### List of Participants

1. Ramsharan
2. Shyam Datt Mishra
3. R. K. Dubey
4. O. P. Pandey
5. B. P. Singh
6. G. C. Dubey
7. V. K. Verma
8. Kanhaya Ram
9. R. K. Khanna
10. A. K. Mathur
11. C. K. D. Kulshreshtha
12. S. K. Kansal
13. K. K. Govila
14. P. K. Shrivastava
15. J. B. Agarwal
16. M. Kalan
17. Y. K. Mishra
18. M. A. Khan



### ANNEXURE III

The Gram Pramukh of village Rajgarh and a lecturer of a local college were present during installation of iron removal plant at Dadra, with the request that NEERI scientists should visit the hand pump, located in Kisan Intermediate College, Rajgarh. They had problems of foul smell and bad taste with hand pump water. Accordingly, the water sample from the pump was collected and tested for iron concentration which was observed to be 4mg/L. The Pump's impeller movement was not proper and it used to take long time to deliver water and delivery of water was much less as compared to its usual discharge. This was informed to the concerned authority as its repair had become necessary. Kisan Intermediate College has one open well in the premises which used to become dry during summer and the only source remains is the hand pump water. The strength of the college is more than thousand students. The hand pump water contains high concentration of iron and requires treatment for potable use. Keeping all these points in view, and with the consent of U.P. Jal Nigam authority, NEERI scientists decided to instal another Iron Removal Plant at the hand pump located in the Kisan Intermediate College instead of Dadra near road side pump. The Iron Removal Plant was to instal at the existing height of hand pump, using the technique developed by UNICEF Project Unit of U.P. Jal Nigam for lifting the water. This plant could not be installed by NEERI scientists due to shortage of time, and the same will be done by U.P. Jal Nigam, Mirzapur.

ANNEXURE IV  
TECHNOLOGY MISSION ON  
DRINKING WATER IN VILLAGES  
AND RELATED WATER MANAGEMENT

REGIONAL TRAINING CAMP ON IRON REMOVAL  
AT MIRZAPUR  
NOV. 25-27, 1987

NEERI'S  
IRON REMOVAL PLANT  
(For Hand Pump Connections)

The hand pump water falls over a sprayer tray, from where it trickles over to an aerator tray. The aerator tray contains media of size 1-4 cm gravel/crushed stone to increase the surface area of air-water interphase. The aerated water from the tray flows through the pores over baffle plate to the sedimentation tank.

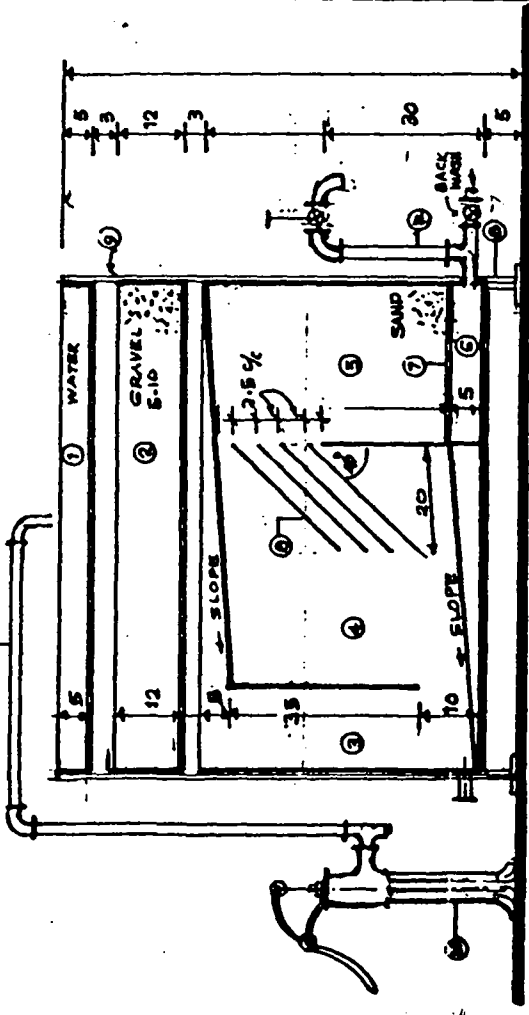
Ground water containing Iron in  $Fe^{++}$  form, oxidises to  $Fe^{+++}$  form by dissolved air. The Ferric iron is insoluble and comes out as precipitate. The precipitated iron settles in sedimentation tank. The sedimentation tank is provided with a plate settling device to enhance the settling. The settled water flows through plate settlers to filter bed.

The filter bed contains sand media of size 1-2 mm diameter. The sand bed is supported by a supporting gravel of size 4-6 mm. The depth of gravel is about 5 cm. The gravels are placed over perforated sheet. The filtered water is taken out by the tap attached to it.

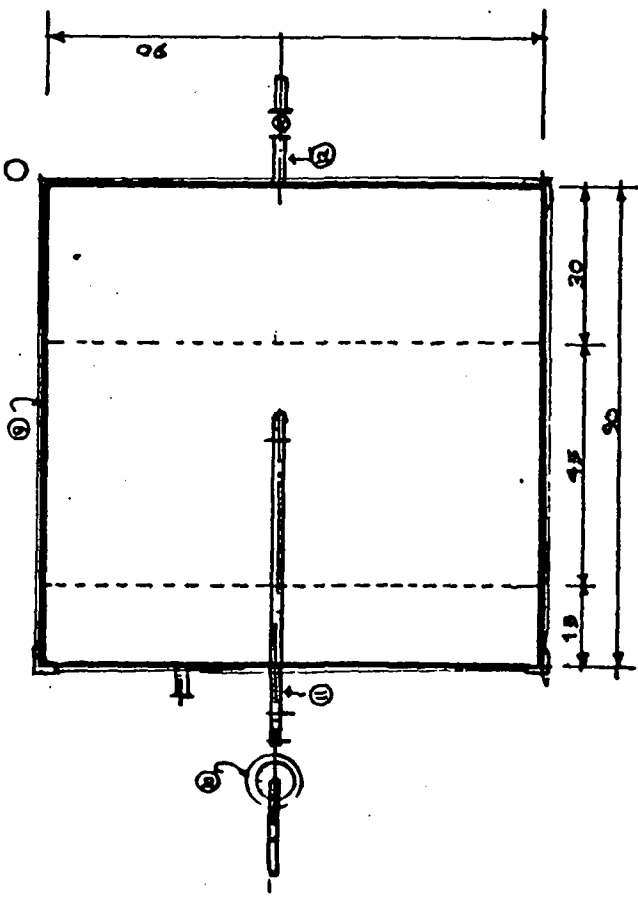
#### Maintenance & Cleaning of Filter

After installation of the plant about 300 L of water has to be pumped to get water from tap. The needy person has to pump the water and collect the iron-free water from the tap. The precipitated ferric iron settles in the settling tank as sludge and requires scour periodically according to the iron concentration in raw water and quantity of water pumped. The calculated periodicity is given in Table 3. The filter gets choked by carrying unsettled iron particles and requires to be cleaned periodically. The cleaning of filter and scouring of sludge can be coupled together. The sprayer tray, aerator tray and baffle sheet are removed. The hand pump is connected with the bottom of the filter. The sand bed is scoured manually by hand shaking.

The hand pump is operated with possible high speed to back wash the filter bed. This operation should be done in a sequence without any pause. The operation of the hand pump is continued till clean water accumulates over the sand bed. When filter gets cleaned, close the scouring valve and baffle sheet, aerator tray, and sprayer tray are replaced and the Unit will be ready for operation.



SECTIONAL ELEVATION



PLAN

- ① SPRAY TRAY: - G.I. SHEET, 18 GAUGE, 50X90X5, PERFORATED BOTTOM OF 3 φ HOLES AT 2 C/C.
- ② AERATION TRAY - do SIZE 90X90X12
- ③ COLLECTION CHAMBER: 90X15X35
- ④ SETTLING CHAMBER: 90X45X35
- ⑤ FILTER CHAMBER: 90X30X40
- ⑥ FILTER WATER CHAMBER: 90X30X5
- ⑦ PERFORATED PLATE: 90X20X3, 3 φ HOLES @ 2 φ
- ⑧ PLATE SETTLERS: 90X20X20-4 NOS INCLND AT 45° @ 2.5%
- ⑨ M.S. ∟ IRON FRAME WITH SUPPORT: 35X45X6
- ⑩ BORE WELL - HAND PUMP
- ⑪ RAW WATER INLET PIPE: 50 mm φ
- ⑫ TREATED WATER OUTLET PIPE TO STAND POST: 50 mm φ

NOTE: ALL DIMENSIONS ARE IN CMS.

IRON REMOVAL PLANT FOR HAND PUMP (CAP; 5 LIT/MIN)

NEERI'S IRON REMOVAL PLANT FOR  
HAND PUMP CONNECTION

DESIGN CRITERIA

Plant Capacity	300 L/hour
Hand Pump	INDIA Mark-II or equivalent
Flow Rate (ave.)	5 L/min
Sprayer Tray	90 x 90 x 5 cm <sup>3</sup>
Aerator Tray	90 x 90 x 12 cm <sup>3</sup> packed with 1 cm - 4 cm dia. gravel.
Sedimentation Tank	90 x 90 x 40 cm <sup>3</sup>
-- Detention time	40 minutes
-- Plate settler	4 Nos. plates 90 x 28 cm. area at 45° angle. distance in between: 2.5 cm
-- Baffle plate	To avoid mixing with incoming aerated water in settling tank.
Sand Filter	90 x 30 x 50 cm <sup>3</sup>
-- Sand bed	90 x 30 x 15 cm <sup>3</sup>
-- Effective size	1-2 mm
-- Depth	15 cm.
-- Filtration rate	2 cm/min.
-- Support gravel: size depth	4-6 mm 5 cm
-- Perforated plate	90 x 30 cm <sup>2</sup>
-- Sand to be cleaned by manual scouring.	

TABLE 4

Parameter	IRON CONTENT IN RAW WATER (mg/L)						
	2	4	6	8	10	15	20
g Fe/m <sup>3</sup> Raw Water	2	4	6	8	10	15	20
g/m <sup>3</sup> Fe(OH) <sub>3</sub> pprox.	4	8	12	16	20	30	40
Fe(OH) <sub>3</sub> in 5 m <sup>3</sup> /d in gms.	20	40	60	80	100	150	200
Fe(OH) <sub>3</sub> per week (35 m <sup>3</sup> /week)	140g	280g	420g	560g	700g	1050g	1400g
Percentage of sludge in 50 L scouring volume/week	0.28%	0.56%	0.74%	1.12%	1.40%	2.10%	2.80%
Scouring time in days keeping sludge concen- tration 5% and scouring volume 50 L for 5 m <sup>3</sup> /d treated water	125 d	63 d	42 d	31 d	25 d	17 d	13 d

# अब गांव वाले शुद्ध जल पा सकेंगे

(सखी नारायण सिंह)

राजगढ़ (मिर्जापुर)। देश के सर्वाधिक दूषित पेयजल व पेयजल-अभावग्रस्त १० जनपदों में मिर्जापुर जनपद को भी अधीक्षित कर यहां शुद्ध जल उपलब्ध कराने के लिये राष्ट्रीय पर्यावरण अभियांत्रिकी शोध संस्थान (नीरी) नागपुर ने भारत सरकार द्वारा संचालित योजना के तहत पानी में मिश्रित प्लोराइड, बत्तोराइड एवं आयरन को निकालने का आसान तरीका खोजने में अभूतपूर्व सफलता प्राप्त की है।

ज्ञातव्य है कि मिर्जापुर जनपद के सूखा प्रभावित क्षेत्रों में धरोतल के नीचे पाये जाने वाले जल में ८ से १२ मिली ग्राम प्रति लीटर

हैण्डपम्पों के लिए राष्ट्रीय पर्यावरण अभियांत्रिकी शोध संस्थान के वैज्ञानिकों द्वारा किया गया।

जन निगम के सम्मत अभीयन्ताओं को गत २५ से २७ नवम्बर तक कार्यशाला में प्रशिक्षण दिया गया।

## राष्ट्रीय पर्यावरण अभियांत्रिकी शोध संस्थान के वैज्ञानिक प्रयोग में सफल

डा. वी.पी. फेरगोन्कर महायक निदेशक 'नीरी' ने यहां बताया कि एक हैण्ड पम्प से लगभग २५० घर्षित लाभान्वित होते हैं जिन्हें शुद्ध एवं स्वास्थ्य बर्धक पानी देने के लिये मात्र दो से तीन हजार रुपये में यह संयंत्र

अधीक्षण अभियन्ता एवं अधिशासी अभियन्ताओं ने राजगढ़ आकर प्रदर्शन एवं संयंत्र द्वारा शोधित जल का परीक्षण किया तथा प्रशंसा करते हुए इस कार्यक्रम को जनपद में तुरन्त लागू करने का आश्वासन उपरि उक्त जन प्रतिनिधि को दिया।

क्षेत्र समिति राजगढ़ की बैठक में आये विधायक श्री यदुनाथ सिंह, महासचिव उ.प्र. लोकदल 'अ', इका नेता एवं क्षेत्रीय अध्यक्ष भिदनाथ सिंह, ब्लाक प्रमुख श्री गुलाब सिंह, सम्मत ग्राम प्रधानों तथा अपर जिलाधिकारी (विकास) श्री जे.पी. त्रिपाठी ने 'नीरी' के वैज्ञानिकों द्वारा लगाये गये संयंत्र का निरीक्षण किया और वैज्ञानिकों के प्रयास की सराहना की।

अपर जिलाधिकारी ने संयंत्र की उपयोगिता के बारे में जिलाधिकारी को अवगत कराने का आश्वासन दिया ताकि पूरे जनपद के लोगों को इस में लाभान्वित किया जा सके।

संयंत्र की शोधकर्त्री एम.वी. वैद्य तथा रसायन वैज्ञानिक श्री वी.पी. देशपाण्डे तथा श्री ए.एम. देशपाण्डे व महायक निदेशक डा. वी.पी. फेरगोन्कर ने बताया कि इस क्षेत्र में ही उपलब्ध चूना, पत्थर, मंगमरमर, बालू-पत्थर, कंकड़ आदि का उपयोग कर जन को शुद्ध करने का यह मचसे आसान एवं सस्ता तरीका है।

पत्रकारों ने बताया कि लोहे के दो रूप 'फेरम' एवं 'फेरिक' हैं। 'फेरम' अविन्य है तथा 'फेरिक' विन्य है। फेरिक पानी में मिलने पर फेरिक हाइड्राक्साइड बनता है जो विन्य है। फेरम में फेरिक में बदलने की क्रिया को आक्सीकरण कहते हैं। लोहे का यह स्वरूप हानिप्रद नहीं होता। इसी प्रक्रिया का उपयोग इस संयंत्र के माध्यम में किया गया है।

इस संयंत्र में जनपद में शुद्ध पेयजल की सम्पदा दूर करने में मदद मिलेगी।



दूषित पेयजल को शुद्ध करने वाले संयंत्र के पास खड़ी है वैज्ञानिक एवं संयंत्र की डिजाइनर श्रीमती एम.वी. वैद्य। संयंत्र के पीछे (चश्मा लगाये) 'नीरी' के सहायक निदेशक श्री वी.पी. फेरगोन्कर एवं कर्मी पर लोह मिश्रित जल की जांच करते वैज्ञानिक श्री ए.एम. देशपाण्डे। संयंत्र के नल से वैज्ञानिक श्री वी.पी. देशपाण्डे पानी लेते हुए।

छाया: गणेश प्रसाद सिंह।

लोहाश मिला है, जो स्वास्थ्य के लिए अत्यन्त हानिकारक है।

लोहाश मिश्रित दूषित पेयजल के अपसार्जन संयंत्र (शुद्धीकरण संयंत्र) का सफल प्रदर्शन गत २७ एवं २८ नवम्बर को विजयस खण्ड राजगढ़ मुख्यालय एवं स्थानीय विजयस खण्ड राजगढ़ मुख्यालय एवं स्थानीय विजयस खण्ड राजगढ़ मुख्यालय पर जन निगम के

आमानी में कही भी बनाया जा सकता है। इस संयंत्र की विशेषता यह है कि ना किस्ती रसायन के प्रयोग के बिना ही शुद्ध एवं मीठा जल उपलब्ध कराया जा सकता है।

यह संयंत्र देश में पहली बार मिर्जापुर जनपद के राजगढ़ क्षेत्र में किया जा रहा है। इस सम्बन्ध में जनपद के अन्तर्गत कार्यरत

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# जौनपुर समाचार