

**EXPRESSION OF INTEREST (EoI)  
FOR**

Transfer of Software

**“RISK-PiNET2.0 for Water Distribution System  
Management”**



**October 2022**

**CSIR-National Environmental Engineering Research Institute (NEERI), Nehru  
Marg, Nagpur - 440 020 Maharashtra**

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## 1. Introduction

CSIR-NEERI has developed 'RISK-PiNET2.0: Software for Water Distribution System Management'. Software RISK-PiNET2.0 is Copyright of CSIR-NEERI with Registration No. SW-13985/2020. The software has wide application in the Water Distribution System Management. CSIR-NEERI intends to transfer its know-how to MSMEs/ Consultancy firms/ Government Organizations etc. with Engineering and Scientific knowledge, good financial background and adequate experience of water distribution systems. CSIR-NEERI has decided to issue a **non-exclusive license** for a period of **three years** for replicating this know-how countrywide.

## 2. About CSIR-NEERI

CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur is one of the premium institute of CSIR under the Ministry of Science and Technology, Govt of India. The institute is dedicated to research and innovations in environmental science and engineering, besides providing solutions to a range of problems posed by industry, government, and society. Over the years, the institute has developed excellence and expertise and global recognition in emerging areas of environmental science and engineering.

## 3. About Software RISK-PiNET

RISK-PiNET is a modular software with following modules:

- i. Pipe Condition Assessment (PCA): To assess the condition of each pipe in the water supply network for its vulnerability to fail and provide estimate of its Remaining Useful Life (RUL)
- ii. Contamination Risk Assessment (CRA): To identify the pipes with "High" risk of contaminant intrusion
- iii. Validation: To validate results of PCA and CRA using complaint data
- iv. Cost: To provide cost of replacement of "High" risk pipes
- v. Report: Auto report generation

More information about RISK-PiNET2.0 is given in the **Annexure-A**.

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## Features of RISK-PiNET2.0

- RISK-PiNET is a GIS-based, user-friendly software with enhanced reporting features for PCA, CRA and Cost module.
- It is developed for Window platform.
- Structure of the software is modular; all modules are independent of each other.

## Guaranteed Outputs

- Input Data Analysis
- Pipe Vulnerability to fail: High, Medium and Low with colour coding on map
- Contamination risk in each pipe: High, Medium and Low with colour coding
- GIS output with Open Street Map in the background
- Statistical summary of results
- Detail as well as concise report

## Benefits of the software

- With the use of RISK-PiNET2.0 software, Municipal Corporations/ network operator can identify the critical water pipes in poor condition and having contaminant intrusion, estimate cost of pipe replacement, design Operation and Maintenance (O&M) plan and proactively repair or replace the pipes before complete failure of the network. This will reduce the water loss and contamination events, in turn benefitting the ULBs/Municipal Corporations/Water Boards and society at large.
- The current practice to identify the pipe for repair /or replacement is by digging trial pits at number of places after the complaint of pipe break/burst or contaminated water supply is registered with Municipal Corporations / or Water Boards. This reactive approach to address the problem which is often slow, trial and error based and inconvenient to public can be improved by a-priori knowledge.
- Prior knowledge about the condition of the system using RISK-PiNET2.0 will enable the consultant/firm to plan for optimum pipe replacement with investment required, as against approximate 15 to 20% per year replacement in Replacement and Renewal (R&R) schemes.
- This proactive assessment and replacement strategy will benefit the ULBs in many ways- 1) improve the water supply network performance, 2) reduction in non-revenue

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water, 3) avoid complete failure of water supply network, 4) reduce contamination issues and 5) improve the service delivery and ensure supply of safe drinking water.

### **Pre-requisites for the Software**

The software requires GIS map of water pipe network with attributes - pipe diameter, length, material, installation year and bury depth for Pipe Condition Assessment (PCA). Similarly, GIS maps of Sewer and Open drains with attributes are required for Contamination risk assessment (CRA). Standard Schedule of Rates (SSR) is used in cost estimation.

### **4. Application of the Software**

The software is useful to understand the pipes which are vulnerable to fail and having risk of contaminant ingress due to open drains and sewers. It identifies the critical pipes for O&M and replacements with cost estimates. Thus it will help the consultants/agencies/organizations engaged in preparation of Detail Project Report (DPR) for water distribution system management.

For optimum performance, software can be implemented in Command areas (CAs)/ District Meter Areas (DMA) of approximately 1000 pipes per simulation. City-wide implementation can be replicated in similar manner for Number of CAs /DMAs.

### **5. Technology Transfer Package**

The Transfer of Technology (ToT) package contains the following:

- A CD/DVD with software executable file, supporting files, user manual and demo data (source code will not be provided)
- Hands-on Training for one or two days about working of different modules of the software, input-output and report generation with sample data set.
- Support for installation, configuration, demonstration and software trouble shooting for a period of 3 years. Any additional feature or development required will be provided on charged basis.
- In case GIS data not available, CSIR-NEERI will help to convert CAD files to GIS database on chargeable basis.

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## 6. License Fee and Royalty

- The license fee of the software is 10 Lakhs rupees (Ten lakhs rupees) + GST (as applicable).
- The validity of the software license is for the period of 3 years.
- After the validity period of the software, Licensee need to renew the license of the software with new rates, terms and conditions.
- 10% of the license fee as royalty every year will be charged towards software maintenance and troubleshooting.

## 7. Who can apply?

- a. The firms/ Private Agencies/Consultants working in the area of Designing of Water Distribution system (WDS), laying pipe network, O&M of WDS network, DPR preparation, water supply project design, development etc. with 10 years of dedicated experience in this area.
- b. The Govt organizations like ULBs, Municipalities, Municipal Councils, Mission project Directorates, Water Boards, Nagar parishads, Nagar Panchayat, Water supply department of state government, state government undertakings, Maharashtra Jeevan Pradhikaran, Pradesh Jal Nigam etc
- c. The firm should have adequate experience of using designing software's like ArcGIS, QGIS, AutoCAD, WaterGem etc.

## 8. How to Apply?

- The EOI shall be submitted in one bid system
- The interested firm should submit **Technical Bid (Envelope)** in the format enclosed in **Annexure-I**
- The firms shall submit their EOI addressing to Director, CSIR-NEERI, Nehru Marg, Nagpur- 440 020. Address for submission of EOI is given below:

To  
Scientist & Head  
Business Development & Project Monitoring and Planning Division (BDPMPD),  
CSIR-NEERI, Nehru Marg, Nagpur 440020  
Email: [pmpddivision@neeri.res.in](mailto:pmpddivision@neeri.res.in); [a\\_sharma@neeri.res.in](mailto:a_sharma@neeri.res.in)

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- All the documents submitted by the selected firms should be signed and numbered.
- Bids that are incomplete in any respect or those that are not consistent with the requirements as specified in this document or those that do not adhere to formats, wherever specified may be considered non-responsive and may be liable for rejection and no further correspondences shall be entertained with such bidders.
- Canvassing in any form would disqualify the bidder.

## 9. Availability of EOI documents:

Bidders should download the complete set of Eoi documents which is available in our website [https://www.neeri.res.in/file\\_homes/25015521\\_EOI\\_RISK-PiNET\\_03102022.pdf](https://www.neeri.res.in/file_homes/25015521_EOI_RISK-PiNET_03102022.pdf) . Bidders are requested to visit the website regularly for corrigendum towards any modification/ addition/ bid due date extension etc. for this Eoi, since the same shall not be published in newspapers.

## 10. Qualification Criteria:

- The organization must be a reputed firm/company/MSME in area of water supply projects design, development and O&M of Water Distribution System (WDS).
- The firm should have carried out work for Designing of WDS using software like AutoCAD, WaterGem etc.
- The firm should have experience in laying pipe network and O&M of WDS network in addition to preparation of DPR for the same.

**The details about points (i) to (iii) should be provided for past 3 years in Technical Bid (Annexure I), Annexure 1.1, Point No. 14 and Annexure 1.3 of EOI by enclosing copies of work orders, completion certificates etc.**

- Implementation plan for the RISK-PiNET software and list of potential clients should also be provided in **Technical Bid (Annexure I), Business Plan (Annexure 1.4)** of EOI.
- The firms must agree to pay the software license fee and royalty to CSIR-NEERI as defined in section 5 of EOI.

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## 11. Process for Selection of Firm

- a) Technically qualified firms as per above section 9, points (i) to (v) will be called for discussion and presentation before Technology Transfer Committee of CSIR-NEERI before final acceptance as per CSIR-NEERI's approved procedure. The firms will be shortlisted based on the presentation, discussion and documents supporting experience of firm in water sector.
- b) All shortlisted firms will be offered Transfer of Knowhow on Non-exclusive basis.
- c) The transfer of knowhow shall be executed through Licensing Agreement with standard terms and conditions.

## 12. Other Conditions

- i. CSIR-NEERI reserves the right to withdraw/cancel this EoI or this request for EOI without assigning/notifying any reason and/or invite afresh with or without amendments, without liability or any obligation for such request for EOI. Information provided at this stage is indicative and CSIR-NEERI reserves the right to amend/add further details at final stage of selection.
- ii. The decision of the Director, CSIR-NEERI, Nagpur shall be final and shall be binding.
- iii. CSIR-NEERI shall not be responsible for any expenditure incurred by the applicants in connection with the preparation and delivery of their applications or any other expenses incurred as regards the subject EoI.
- iv. Telefax/ E-mail/ CD shall not be accepted if not accompanied with a formal signed document. CSIR-NEERI takes no responsibility for any delay/ loss during posting for non-receipt of document sent by Post/ Courier within the due date.
- v. Mere submission of the proposal/ application does not entitle automatic qualification.
- vi. Proposals found suitable shall be shortlisted for detailed discussion/ presentation by the Technology Transfer Committee (TTC) before final acceptance as per CSIR-NEERI's approved procedure.
- vii. Any clarification against this EoI can be sought from the designated official(s) only

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in writing or through e-mail, which shall be clarified by the designated official only through e-mail. CSIR-NEERI may at its discretion extend this deadline for the submission of EOI.

- viii. To assist in the examination, evaluation and comparison of EOI, CSIR-NEERI at its discretion can ask the bidder for the clarification or submission of additional information/documents. However, post submission of clarification at the initiative of the bidder shall not be entertained. Authority reserves the right to visit the facilities of the bidders if required.
- ix. At any time before the submission of the bids against the EOI, the CSIR-NEERI may carry out amendments(s) to this EOI document and/ or the schedule. The amendment shall be made available on the website [www.neeri.res.in](http://www.neeri.res.in) and will be binding on them.
- x. The Authority reserves the right to accept or reject any application without assigning any reason thereof.

### 13. Contact Person for technical enquiries

Dr (Mrs) Aabha Sargaonkar  
Senior Principal Scientist  
CTM Division  
CSIR-National Environmental  
Engineering Research Institute  
Nehru Marg, Nagpur-20  
Tel: +91-0712249990  
Email: [ap\\_sargaonkar@neeri.res.in](mailto:ap_sargaonkar@neeri.res.in)

Er Asheesh Sharma  
Principal Scientist  
CTM Division  
CSIR-National Environmental  
Engineering Research Institute  
Nehru Marg, Nagpur-20  
Tel: +91-0712249990  
Email: [a\\_sharma@neeri.res.in](mailto:a_sharma@neeri.res.in)

### 14. Details of bids

“One BID SYSTEM” shall be followed for this EOI. Bidder should take due care to submit tender before due date submission through hard copies. Bid evaluation criteria shall be the basis for evaluation of EOIs received. Bids not confirming to tender conditions are liable to be rejected. Supporting documents required, if any, in conformity of facts mentioned in the bid may be sought subsequently at the discretion of the Competent Authority.

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## 15. Submission of EOI

The EOI proposal should be submitted with all supporting documents as required in section 9. The Technical information may specify details and strength of the applicant as specified in **Annexure –I**. The last date for submission of Eoi is **Dec 20, 2022 till 5:00 PM**

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# Annexure A



RISK-PiNET2.0 is a GIS based Pipe Condition Assessment and Contamination Risk Assessment Software for Water Distribution System. The software aimed to provide Water Utilities and Boards

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with tools needed for sustainable management planning of distribution network. It is a modular software with following modules:

- Pipe Condition Assessment (PCA): To assess the condition of each pipe in the water supply network for its vulnerability to fail and provide estimate of its Remaining Useful Life (RUL)
- Contamination Risk Assessment (CRA): To identify the pipes with “High” risk of contaminant intrusion
- Validation: To validate results of PCA and CRA using complaint data
- Cost: To provide cost of replacement of “High” risk pipes

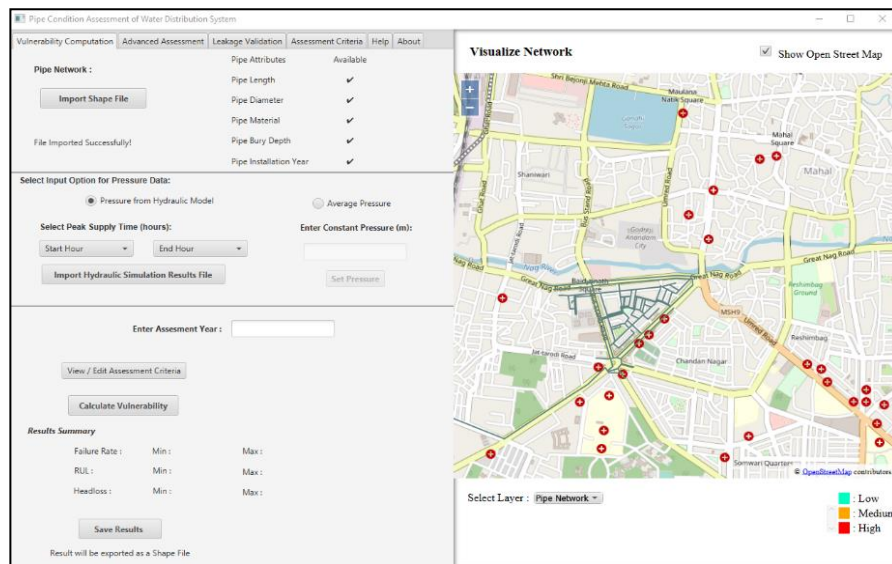


Fig 1. Pipe Condition Assessment (PCA)

## 1. Development Platform

PCA module is developed in Java while all other modules are developed in Python as a QGIS plugin. QGIS is open source GIS software which provide GIS capability to Process and Visualize software inputs and output on Map. The reports are generated using power BI application built-in the software.

## 2. Hardware Requirements

- Operating System: Windows 7 and above.
- RAM: 4 GB and above.
- HD Storage: QGIS occupies around 600 MB while RISK-PiNET 2.0 software package required 315 MB.

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### 3. GIS inputs required for the software

S.No.	Input Shapefile	Geometry Type	CRS
1	Water Pipes	Line String	UTM Zone
2	Water pipe nodes	Point	UTM Zone
3	Sewer Pipes	Line String	UTM Zone
4	Drains	Polygon	UTM Zone
5	Soil map	Polygon	UTM Zone
6	Plot layout	Polygon	UTM Zone
7	Road network	Line String	UTM Zone
8	Contamination complaints	Point	UTM Zone
9	Leakage complaints	Point	UTM Zone

Note: Projection system should be set to CRS within EPSG: 32642 to 32647.

### 4. Output of the software

- Pipes which are highly vulnerable to fail
- Remaining Useful Life (RUL) of each pipe in the network
- Pipes having high risk of contamination ingress
- Cost estimation for the replacement of high risk pipes
- Statistical summary of above results
- Detail as well as concise report

### 5. Application of RISK-PiNET2.0

The applicability of RISK-PiNET2.0 has been demonstrated through case study of risk assessment of water distribution system (WDS) with sample dataset. This sample dataset is provided with the software package. The sample dataset has total 167 number of pipes and 142 number of nodes. Network map is shown in Fig 1 and brief description of pipes is given in Table 1. RISK-PiNET2.0 software has been used to assess vulnerability, contamination ingress and risk (Fig 2-4) in WDS for the assessment year 2021.

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Material	No. pipes	Total length (km)
GI	2	0.03
DI	14	1.30
CI	151	15.95
	167	17.27

Table 1. Sample dataset

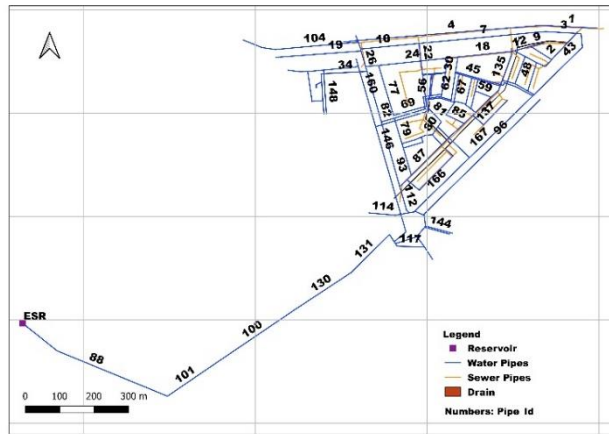


Figure 1 Input Data

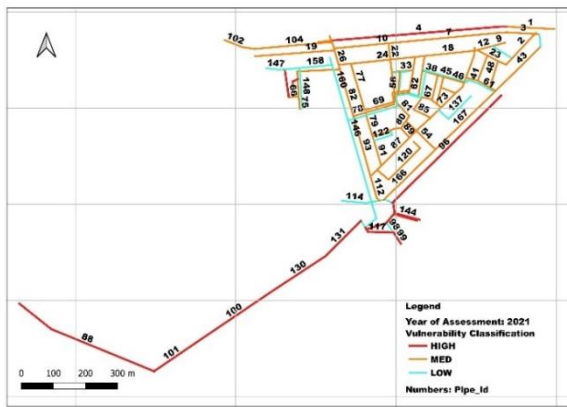


Figure 2 Pipes vulnerable to fail

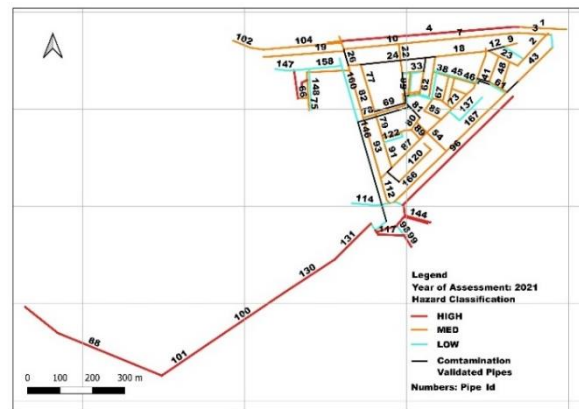


Fig 3. Pipes having contamination ingress

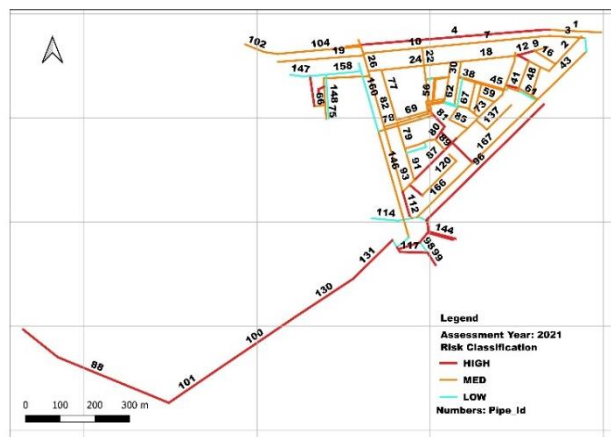


Fig 4. Pipes in risk of failure and contaminant ingress

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## Envelope A

# Technical Bid

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**COVERING LETTER**

(On Company/ Institute letterhead)

Date:

**To,****DIRECTOR**

CSIR-National Environmental Engineering Research Institute  
Nehru Marg, Nagpur-440 020  
Maharashtra, INDIA

**Subject : Submission of Expression of interest (EOI) for Transfer of “RISK-PiNET” :  
A Tool for Water Distribution System Management**

**Dear Sir,**

Having examined the Expression of Interest (Eoi) the undersigned, on behalf of our company intend to participate in EOI for Transfer of **RISK-PiNET2.0** Knowhow and submit the Qualification requirements proposal in response to the Expression of Interest (Eoi) for the said EOI. We attach here with the response, as required by the Eoi, which constitutes our proposal.

I/We confirm that the information contained in this response or any part thereof, including its exhibits and other documents is true, accurate, verifiable and complete. I/We fully understand and agree to comply that on verification, incorrect information, if found to have been furnished the bid/ order is liable for rejection at any stage of evaluation/ work execution. Our Firm/Company agrees for acceptance of all the terms and conditions set out in the EOI documents. It is hereby confirmed that following employee we are entitled to act on behalf of our company/ corporation/ firm/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

Our Authorised contacts for our company are:

Name:

Designation:

Address:

Phone No: &amp; Mobile No:

Fax:/ E Mail:

(Signature and Seal of Company)

(In the capacity of Director/CEO)

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## DETAILS OF THE COMPANY

	Item	Details (Attached True copy)
1.	Name of the party/legal entity With Year of establishment	
2.	Name of the Owner/ Founder contact details	
3.	Details of Directors	
4.	Details of Registration as an industry/legal entity (copy of certificate to be enclosed)	
5.	Address of works & Registered office premises	
6.	Certificate of Incorporation	
7.	PAN Number	
8.	GST Number	
9.	Udyog Aadhar	
10.	Details of office Premised/ branches/ industry etc.	
11.	Details of CEO/MD/GM	
12.	List of regular employees with qualifications, experience should be provided	
13.	Total Staff of Company	
14.	Details of work done in past 3 years. Copies of work orders, completion certificates etc.	

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## FINANCIAL DETAILS OF COMPANY

	FY 2019-20	FY 2020-21	FY 2021-22
Annual turnover			
Net Profit			
Net Worth			
Debt/Equity ratio			

**Note- Please submit Audited Annual Reports containing audited balance sheets and profit loss accounts statements for preceding 3 financial years**

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**EXPERIENCE CRITERIA&PROVEN TRACK RECORD****List top five projects ongoing/ completed, if any (Last 3 years) in Water sector**

Name of the Project	Sponsoring Agency	Amount sanctioned (Rs Lakhs)	Amount released (Rs Lakhs)	Duration (in years) From- To	Awards (If any)

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**BUSINNESS PLAN**

[Details Business Plan for implementation of knowhow with clients/Water Boards/  
Municipal Corporations/Operators, plan shall have details on the facts and figures]

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**AFFIDAVIT**  
(On 100 rupees' stamp paper)

I, \_\_\_\_\_ Son of \_\_\_\_\_  
 Aged about \_\_\_\_\_ years, resident of \_\_\_\_\_  
 and \_\_\_\_\_  
 \_\_\_\_\_ (Director/Partner/Proprietor) of \_\_\_\_\_  
 \_\_\_\_\_ having its Registered office at \_\_\_\_\_,  
 \_\_\_\_\_, do hereby solemnly affirm and  
 declare as under:

1. We are not debarred or black listed by any of the Government Authorities / Government Organization / Public Sector Undertakings / Private Organizations for carrying out any of the assignments, tasks, works, projects etc.
2. We have not defaulted in repayment of any of the undisputed dues raised / taken by us from financial institution / Non-Banking Financial Company (NBFC's) and banking companies.
3. No case of the fraud has been lodged against us by any of the stakeholders including Government departments, banks and financial institutions or any other Person / Organization.
4. We have complied with all regulatory and statutory requirements applicable to our organization till \_\_\_\_\_
5. We will abide by all the rules, regulations and directions given by CSIR-NEERI or any of the departments in relation to the projects for which such license is being allotted.

That the contents of this affidavit are true to the best of my knowledge and belief, and nothing in material has been concealed in.

I also acknowledge that CSIR-NEERI has right to cancel all the licenses granted in relation to which this affidavit is executed, if any of the information, explanation provided to CSIR-NEERI seems untrue.

Date: -

Place: -

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**UNDERTAKING WITH REGARD TO NON-LITIGATION**

(To be submitted on Company's Letter Head)

**To**

**DIRECTOR**

CSIR-National Environmental Engineering Research Institute  
Nehru Marg, Nagpur-440 020  
Maharashtra, INDIA

**Subject: Undertaking regarding Litigation**

Dear Sir,

It is hereby confirmed and declared that M/s -----, does not have any litigation / arbitration history with any Government department/ Public Sector Undertaking/ / or any other public authority with which any MoU was / has been executed / undertaken.

Yours faithfully,

(Signature of the Authorised signatory)

Name:  
Designation:  
Seal:  
Date:  
Place:

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