

# MONITORING OF ENVIRONMENTAL PARAMETERS

(INTERIM REPORT FOR RAINY SEASON -2020)

*FOR*

***KINTADA QUARTZ MINE***

**of**

**M/s. Rashtriya Ispat Nigam Limited.**

**(GOVERNMENT OF INDIA ENTERPRISE)**

**VISAKHAPATNAM STEEL PLANT**

**Kintada (V), K.Kotapadu (M), Visakhapatnam (Dist)**

**Andhra Pradesh.**

**Prepared By**

**M/s. SV ENVIRO LABS & CONSULTANTS**

**(MOEF Recognized, NABL & NABET Accredited And  
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**Enviro House, B1, Block-B, Autonagar, Visakhapatnam -12**



## **TABLE OF CONTENTS**

**CONTENTS**

| <b>Sl.No.</b> | <b>Description</b>         | <b>Pg.No</b> |
|---------------|----------------------------|--------------|
| <b>1.0</b>    | <b>Introduction</b>        | <b>5</b>     |
| <b>1.1.</b>   | <b>Location of Project</b> | <b>5</b>     |
| <b>2.0</b>    | <b>Scope of Work</b>       | <b>7</b>     |
| <b>3.0</b>    | <b>Methodology</b>         | <b>9</b>     |
| <b>4.0</b>    | <b>Water Quality</b>       | <b>11</b>    |

**LIST OF ANNEXURES**

| <b>Annexure. No.</b> | <b>Description</b>   | <b>Pg.No</b> |
|----------------------|----------------------|--------------|
| <b>Annexure – 1</b>  | <b>Water Quality</b> | <b>15</b>    |

**CHAPTER – 1**

**INTRODUCTION**

## 1.0 INTRODUCTION

Rashtriya Ispat Nigam Limited, the corporate entity of Visakhapatnam Steel Plant is a Navratna PSE under the Ministry of Steel. Visakhapatnam Steel Plant fondly called Vizag steel. It is the first shore based Integrated Steel Plant in the country and is known for its quality products delighting the customers. It is a market leader in long products and it caters to the needs of diverse industrial sectors. It is the first Steel plant to be certified ISO 9001:2008 (presently 2015), ISO 14001:2004 (presently 2015), OHSAS 18001:2007 and ISO/IEC 27001:2013 Standards. It is also the first PSE to be certified ISO 50001:2011 – Energy Management Systems and has acquired CMMI Level 3 Certification for S/W development.

The Infrastructure of Visakhapatnam Steel Plant comprises of Coke Ovens and Coal Chemical Plant, Sinter Plant, Blast furnace, Calcining and Refractory Material Plant, Steel Melt Shop and Continuous Casting, Light and Medium Merchant Mill, Medium Merchant and Structural Mill, Wire rod mill, Steel melt shop, Thermal power plant.

Rashtriya Ispat Nigam Limited, has captive mines namely Jaggayyapeta Limestone Mine, Madharam Dolomite Mine, Garbham Manganese Mine, Saripalli Sand Mine and Kintada Quartz Mine.

RINL has retained M/s. SV ENVIRO LABS & CONSULTANTS, to carry out the environmental monitoring studies at Kintada Quartz Mine.

This report presents the environmental monitoring data of Rainy Season – August '2020 at Kintada Quartz Mine.

## 1.1 LOCATION OF THE PROJECT

The Project site is located at Kintada Quartz mine of M/s. Rashtriya Ispat Nigam Limited located at Kintada Village, K.Kotapadu Mandal, Visakhapatnam District, Andhra Pradesh.

**CHAPTER – 2**

**SCOPE OF WORK**

## 2.0 SCOPE OF WORK

The scope of the studies include monitoring of the following environmental components

### 1. Water quality

The parameters covered under the scope for each of the above attributes are given below:

### SCOPE OF WORK

| S.No | Attribute            | Scope  |
|------|----------------------|--|
| 1.   | <b>Water quality</b> | Collection and analysis of river water/mine discharge water/well water and treated water as per <ul style="list-style-type: none"><li>• IS 10500 (Drinking water specifications)</li><li>• GSR 422 (E) –Inland surface water</li></ul> <b>Frequency</b> : Once in a season for all the four seasons at all locations |

**CHAPTER – 3**  
**METHODOLOGY**



### 3.0 METHODOLOGY

Methodologies adopted for sampling and analysis for each of the above parameters are detailed below

Methods of monitoring and analysis for various parameters

| S.No | Attributes   | Measurement Technique                     |
|------|--|---|
| 1.   | <b>Water Quality (Surface water, Mine discharge water, Well Water and Treated water)</b> | As per APHA 23 <sup>rd</sup> Edition'2017 |

**CHAPTER – 4**  
**WATER QUALITY**

**4.0 STUDY OF WATER QUALITY – AUGUST – 2020**

| <b>S.No</b> | <b>ATTRIBUTE</b> | <b>SCOPE</b>  | <b>STUDIES CARRIED OUT</b>   |
|-------------|------------------|---|--|
| 1.          | Water Quality    | Collection of Surface water, Mine discharge water, Well Water and Treated water | Mining area water, Dalivalasa and Kintada bore well water samples have been collected on 28-08-2020. |

**4.1 Water samples were collected at the following points.**

| <b>Station code</b> | <b>Location</b>            | <b>Environmental setting</b> |
|---------------------|----------------------------|------------------------------|
| W1                  | Mining Area                | Surface water                |
| W2                  | Kintada Bore Well Water    | Ground water                 |
| W3                  | Dalivalasa Bore Well Water | Ground water                 |

The methodology for sample collection and preservation techniques was followed as per the Standard Operating Procedures (SOP) mentioned in table hereunder:

### Standard Operating Procedures (SOP) For Water Sampling

| Parameter  | Sample Collection                                 | Sample Size | Storage/ Preservation   |
|--|---|-------------|---|
| pH   | Grab sampling<br>Plastic /glass container         | 50 ml       | Refrigeration,<br>can be stored for 7 days                            |
| Electrical<br>Conductivity                           | Grab sampling<br>Plastic /glass container         | 50 ml       | Refrigeration,<br>can be stored for 7 days                            |
| Total suspended solids                               | Grab sampling<br>Plastic /glass container         | 100 ml      | Refrigeration,<br>can be stored for 7 days                            |
| Total Dissolved<br>Solids                            | Grab sampling<br>Plastic /glass container         | 100 ml      | Refrigeration,<br>can be stored for 7 days                            |
| BOD  | Grab sampling<br>Plastic /glass container         | 500 ml      | Refrigeration, 48 hrs   |
| Hardness   | Grab sampling<br>Plastic /glass container         | 100 ml      | Add HNO <sub>3</sub> to pH<2,<br>refrigeration; 6 months              |
| Chlorides  | Grab sampling<br>Plastic /glass container         | 50 ml       | Not required; 28 days   |
| Sulphates  | Grab sampling<br>Plastic /glass container         | 100 ml      | Refrigeration; 28 days  |
| Nitrates   | Plastic containers                                | 100 ml      | Refrigeration; 48 hrs   |
| Fluorides  | Plastic containers only                           | 100 ml      | Not required; 28 days   |
| Alkalinity   | Plastic/ glass containers                         | 100 ml      | Refrigeration; 14 days  |
| Ammonia  | Plastic/ glass containers                         | 100 ml      | Add H <sub>2</sub> SO <sub>4</sub> to pH>2,<br>refrigeration, 28 days |
| Heavy Metals (Ar, Cd,<br>Mn, Cu, Fe, Zn, Pb<br>etc.) | Plastic/ Glass rinse with<br>1+1 HNO <sub>3</sub> | 500 ml      | Filter, add HNO <sub>3</sub> to<br>pH>2; Grab sample; 6<br>months     |

Source: Standard Methods for the Examination of Water and Wastewater, Published By APHA 23rd Edition, 2017

The analytical techniques used for water analysis is given in the table hereunder:

### Analytical Techniques For Water Analysis

| S.No | Parameter                 | Method   |
|------|---------------------------|--|
| 1.   | pH                        | APHA, 4500-H+B, 23rd Ed., 2017                             |
| 2.   | Colour                    | APHA, 2120-C/2120-B, 23rd Ed., 2017                        |
| 3.   | Odour                     | APHA, 2150, 23rd Ed., 2017                                 |
| 4.   | Temperature               | APHA, 2550-A+B, 23rd Ed., 2017                             |
| 5.   | Oil & Grease              | APHA, 5520-D, 23rd Ed., 2017                               |
| 6.   | Total Suspended Solids    | APHA, 2540-D, 23rd Ed., 2017                               |
| 7.   | Total Dissolved Solids    | APHA, 2540-C, 23rd Ed., 2017                               |
| 8.   | Total Residual Chlorine   | APHA, 4500-Cl B, 23rd Ed., 2017                            |
| 9.   | Biochemical Oxygen Demand | APHA, 5210-B, 23rd Ed., 2017<br>4500-OC, 23rd Ed., 2017    |
| 10.  | Chemical Oxygen Demand    | APHA, 5220-B, 23rd Ed., 2017                               |
| 11.  | Free Ammonia              | IS 3025  |
| 12.  | Ammonical Nitrogen        | APHA, 4500-NH <sub>3</sub> B, 23rd Ed., 2017               |
| 13.  | Total Kjeldhal Nitrogen   | APHA, 4500-Norg B, 23rd Ed., 2017                          |
| 14.  | Zinc                      | APHA, 3111-B, 23rd Ed., 2017                               |
| 15.  | Lead                      | APHA, 3111-B, 23rd Ed., 2017                               |
| 16.  | Cadmium                   | APHA, 3111-B, 23rd Ed., 2017                               |
| 17.  | Mercury                   | APHA, 3112-B, 23rd Ed., 2017                               |
| 18.  | Arsenic                   | APHA, 3114-B, 23rd Ed., 2017                               |
| 19.  | Copper                    | APHA, 3111-B, 23rd Ed., 2017                               |
| 20.  | Nickel                    | APHA, 3111-B, 23rd Ed., 2017                               |
| 21.  | Cyanide                   | APHA, 4500-CNB, 23rd Ed., 2017                             |
| 22.  | Fluoride                  | APHA, 4500-FD, 23rd Ed., 2017 (SPANDS Methods)             |
| 23.  | Phosphates                | APHA, 4500-PD, 23rd Ed., 2017                              |
| 24.  | Sulphates                 | APHA, 4500-SO <sub>4</sub> <sup>2-</sup> E, 23rd Ed., 2017 |
| 25.  | Sulphide                  | APHA, 4500-S <sup>2-</sup> , 23rd Ed., 2017                |
| 26.  | Manganese                 | APHA, 3111-B, 23rd Ed., 2017                               |
| 27.  | Iron                      | APHA, 3111-B, 23rd Ed., 2017                               |
| 28.  | Phenolic Compounds        | APHA, 5530-B, 23rd Ed., 2017                               |

Analysis results of the water samples collected from the above locations are enclosed as **Annexure – I.**

**ANNEXURE – I**  
**(Water Analysis Reports)**



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Ref: SVELC/RIL-KQM/20-08/01

Date: 18-09-2020

NAME AND ADDRESS : M/s. KINTADA QUARTZ MINE,  
Visakhapatnam Steel Plant,  
Kintada Village,K.Kotapadu Mandal,  
Vizianagaram District ,A.P

SAMPLE PARTICULARS : SURFACE WATER

SOURCE OF COLLECTION : MINING AREA

DATE OF COLLECTION : 28-08-2020

## TEST REPORT

| S.No | Parameter  | Unit      | Result    | Standards as per GSR 422 (E) |
|------|--|-----------|-----------|------------------------------|
| 1    | Colour   | Hazen     | < 1.0     | 5                            |
| 2    | Odour  | Agreeable | Agreeable | Agreeable                    |
| 3    | Turbidity  | NTU       | 7.95      | 5 - 25                       |
| 4    | pH   | -         | 8.98      | 5.5 to 9.0                   |
| 5    | Total Dissolved Solids                                 | mg/l      | 58        | 500 – 2000                   |
| 6    | Total suspended solids                                 | mg/l      | <1.0      | 100                          |
| 7    | Fluorides as F   | mg/l      | 0.04      | 2.0                          |
| 8    | Nitrates as NO <sub>3</sub> <sup>-</sup>               | mg/l      | BDL       | 10                           |
| 9    | Iron as Fe   | mg/l      | 0.03      | 3.0                          |
| 10   | Total Residual Chlorine                                | mg/l      | <0.1      | 1.0                          |
| 11   | Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH | mg/l      | <0.0005   | 1.0                          |
| 12   | Copper as Cu   | mg/l      | < 0.01    | 3.0                          |
| 13   | Manganese as Mn  | mg/l      | 3.7       | 2.0                          |
| 14   | Zinc as Zn   | mg/l      | 0.030     | 5.0                          |
| 15   | Sulphide as S  | mg/l      | 0.046     | 2.0                          |
| 16   | Cadmium as Cd  | mg/l      | <0.01     | 2.0                          |
| 17   | Lead as Pb   | mg/l      | <0.01     | 0.1                          |
| 18   | Mercury as Hg  | mg/l      | <0.001    | 0.01                         |
| 19   | Nickel as Ni   | mg/l      | <0.01     | 3.0                          |
| 20   | Total Arsenic as As                                    | mg/l      | <0.01     | 0.2                          |
| 21   | Total Chromium as Cr                                   | mg/l      | <0.01     | 2.0                          |
| 22   | Hexavalent chromium as Cr <sup>+6</sup>                | mg/l      | < 0.05    | 0.1                          |
| 23   | Vanadium as V  | mg/l      | <0.01     | 0.2                          |
| 24   | Ammonical nitrogen as N                                | mg/l      | BDL       | 50                           |
| 25   | Free ammonia as NH <sub>3</sub>                        | mg/l      | < 0.1     | 5                            |
| 26   | Chemical oxygen demand -COD                            | mg/l      | <10.0     | 250                          |
| 27   | Biochemical oxygen demand -BOD                         | mg/l      | <3.0      | 30                           |
| 28   | Oil & Grease   | mg/l      | <1.0      | 10                           |
| 29   | Selenium as Se   | mg/l      | <0.01     | 0.05                         |

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.005 µg/l

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Ref: SVELC/RIL-KQM/20-08/02

Date: 18-09-2020

**NAME AND ADDRESS** : M/s. KINTADA QUARTZ MINE,  
Visakhapatnam Steel Plant,  
Kintada Village,K.Kotapadu Mandal,  
Vizianagaram District ,A.P.

**SAMPLE PARTICULARS** : GROUND WATER

**SOURCE OF COLLECTION** : BORE WELL WATER- KINTADA VILLAGE

**DATE OF COLLECTION** : 28-08-2020

## TEST REPORT

| S.No | Parameter  | Unit  | Result    | IS 10500:2012 Specifications |
|------|--|-------|-----------|------------------------------|
| 1.   | Colour   | Hazen | < 1.0     | 5.0                          |
| 2.   | Odour  | -     | Agreeable | Agreeable                    |
| 3.   | Temperature  | °C    | 26.2      | -                            |
| 4.   | Taste  | -     | Agreeable | Agreeable                    |
| 5.   | Turbidity  | NTU   | 1.74      | 1.0                          |
| 6.   | pH   | -     | 7.39      | 6.5 – 8.5                    |
| 7.   | Total Dissolved Solids                                 | mg/l  | 1021      | 500                          |
| 8.   | Total Alkalinity as CaCO <sub>3</sub>                  | mg/l  | 176       | 200                          |
| 9.   | Total Hardness as CaCO <sub>3</sub>                    | mg/l  | 552       | 200                          |
| 10.  | Calcium as Ca  | mg/l  | 168       | 75                           |
| 11.  | Magnesium as Mg  | mg/l  | 31.6      | 30                           |
| 12.  | Chlorides as Cl <sup>-</sup>                           | mg/l  | 338       | 250                          |
| 13.  | Fluorides as F   | mg/l  | 0.48      | 1.0                          |
| 14.  | Nitrates as NO <sub>3</sub> <sup>-</sup>               | mg/l  | 49.6      | 45                           |
| 15.  | Sulphates as SO <sub>4</sub> <sup>2-</sup>             | mg/l  | 110       | 200                          |
| 16.  | Iron as Fe   | mg/l  | 0.15      | 0.3                          |
| 17.  | Free Residual Chlorine                                 | mg/l  | < 0.1     | 0.2                          |
| 18.  | Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH | mg/l  | <0.0005   | 0.001                        |
| 19.  | Copper as Cu   | mg/l  | < 0.01    | 0.05                         |
| 20.  | Manganese as Mn  | mg/l  | < 0.01    | 0.1                          |
| 21.  | Zinc as Zn   | mg/l  | 0.046     | 5.0                          |
| 22.  | Aluminum as Al   | mg/l  | < 0.01    | 0.03                         |
| 23.  | Boron as B   | mg/l  | < 0.1     | 0.5                          |
| 24.  | Sulphide as H <sub>2</sub> S                           | mg/l  | 0.021     | 0.05                         |
| 25.  | Anionic Detergents (as MBAS)                           | mg/l  | < 0.01    | 0.2                          |
| 26.  | Barium as Ba   | mg/l  | < 0.1     | 0.7                          |
| 27.  | Chloramines (as Cl <sub>2</sub> )                      | mg/l  | <1.0      | 4.0                          |
| 28.  | Ammonia as total ammonia-N                             | mg/l  | < 0.01    | 0.5                          |
| 29.  | Mineral Oil  | mg/l  | < 0.01    | 0.5                          |
| 30.  | Selenium as Se   | mg/l  | < 0.005   | 0.01                         |
| 31.  | Silver as Ag   | mg/l  | < 0.01    | 0.1                          |
| 32.  | Cadmium as Cd  | mg/l  | <0.001    | 0.003                        |
| 33.  | Cyanide as CN  | mg/l  | <0.01     | 0.05                         |
| 34.  | Lead as Pb   | mg/l  | <0.01     | 0.01                         |
| 35.  | Mercury as Hg  | mg/l  | <0.001    | 0.001                        |
| 36.  | Molybdenum as Mo                                       | mg/l  | <0.01     | 0.07                         |
| 37.  | Nickel as Ni   | mg/l  | <0.01     | 0.02                         |



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|                       |   |           |              |                                 |
|-----------------------|---|-----------|--------------|---------------------------------|
| 38.                   | Total Arsenic as As                           | mg/l      | <0.01        | 0.01                            |
| 39.                   | Total Chromium as Cr                          | mg/l      | <0.01        | 0.05                            |
| 40.                   | Polychlorinated biphenyls                     | mg/l      | <0.0001      | 0.0005                          |
| 41.                   | Polynuclear aromatic Hydrocarbons as PAH      | mg/l      | <0.0001      | 0.0001                          |
| <b>MICROBIOLOGY:</b>  |   |           |              |                                 |
| 42.                   | <i>E. coliforms</i>                           | CFU/100mL | Not detected | Shall not be detected in 100 ml |
| 43.                   | <i>Total coliforms</i>                        | CFU/100mL | 11           | Shall not be detected in 100 ml |
| 44.                   | <i>Faecal coliforms</i>                       | CFU/100mL | Not detected | -                               |
| <b>PESTICIDES:</b>    |   |           |              |                                 |
| 45.                   | Alpha HCH                                     | µg/l      | BDL          | 0.01                            |
| 46.                   | Beta HCH                                      | µg/l      | BDL          | 0.04                            |
| 47.                   | Butachlor                                     | µg/l      | BDL          | 125                             |
| 48.                   | Chlorpyrifos                                  | µg/l      | BDL          | 30                              |
| 49.                   | Delta HCH                                     | µg/l      | BDL          | 0.04                            |
| 50.                   | 2,4- Dichlorophenoxyacetic Acid               | µg/l      | BDL          | 30                              |
| 51.                   | DDT (o,p and p,p-Isomers of DDT, DDE and DDD) | µg/l      | BDL          | 1.0                             |
| 52.                   | Endosulfan (alpha, beta and Sulphate)         | µg/l      | BDL          | 0.4                             |
| 53.                   | Ethion  | µg/l      | BDL          | 3.0                             |
| 54.                   | Gamma-HCH (Lindane)                           | µg/l      | BDL          | 2.0                             |
| 55.                   | Isoproturon                                   | µg/l      | BDL          | 9.0                             |
| 56.                   | Malathion                                     | µg/l      | BDL          | 190                             |
| 57.                   | Methyl Parathion                              | µg/l      | BDL          | 0.3                             |
| 58.                   | Alachlor                                      | µg/l      | BDL          | 20                              |
| 59.                   | Atrazine                                      | µg/l      | BDL          | 2.0                             |
| 60.                   | Aldrin/ Dieldrin                              | µg/l      | BDL          | 0.03                            |
| 61.                   | Monocrotophos                                 | µg/l      | BDL          | 1.0                             |
| 62.                   | Phorate                                       | µg/l      | BDL          | 2.0                             |
| <b>TRIHALOMETHANE</b> |   |           |              |                                 |
| 63.                   | Bromoform                                     | mg/l      | <0.05        | 0.1                             |
| 64.                   | Dibromochloromethane                          | mg/l      | <0.05        | 0.1                             |
| 65.                   | Bromodichloromethane                          | mg/l      | <0.05        | 0.06                            |
| 66.                   | chloroform                                    | mg/l      | <0.05        | 0.2                             |

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.005 µg/l

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Ref: SVELC/RIL-KQM/20-08/03

Date: 18-09-2020

**NAME AND ADDRESS** : M/s. KINTADA QUARTZ MINE,  
Visakhapatnam Steel Plant,  
Kintada Village,K.Kotapadu Mandal,  
Vizianagaram District ,A.P.

**SAMPLE PARTICULARS** : GROUND WATER

**SOURCE OF COLLECTION** : BORE WELL-DALIVALASA VILLAGE

**DATE OF COLLECTION** : 28-08-2020

## TEST REPORT

| S.No | Parameter  | Unit  | Result    | IS 10500:2012 Specifications |
|------|--|-------|-----------|------------------------------|
| 1.   | Colour   | Hazen | < 1.0     | 5.0                          |
| 2.   | Odour  | -     | Agreeable | Agreeable                    |
| 3.   | Temperature  | °C    | 26.5      | -                            |
| 4.   | Taste  | -     | Agreeable | Agreeable                    |
| 5.   | Turbidity  | NTU   | 0.15      | 1.0                          |
| 6.   | pH   | -     | 7.35      | 6.5 – 8.5                    |
| 7.   | Total Dissolved Solids                                 | mg/l  | 1011      | 500                          |
| 8.   | Total Alkalinity as CaCO <sub>3</sub>                  | mg/l  | 172       | 200                          |
| 9.   | Total Hardness as CaCO <sub>3</sub>                    | mg/l  | 594       | 200                          |
| 10.  | Calcium as Ca  | mg/l  | 178       | 75                           |
| 11.  | Magnesium as Mg  | mg/l  | 36.0      | 30                           |
| 12.  | Chlorides as Cl <sup>-</sup>                           | mg/l  | 348       | 250                          |
| 13.  | Fluorides as F   | mg/l  | 0.50      | 1.0                          |
| 14.  | Nitrates as NO <sub>3</sub> <sup>-</sup>               | mg/l  | 50.4      | 45                           |
| 15.  | Sulphates as SO <sub>4</sub> <sup>2-</sup>             | mg/l  | 102       | 200                          |
| 16.  | Iron as Fe   | mg/l  | 2.24      | 0.3                          |
| 17.  | Free Residual Chlorine                                 | mg/l  | < 0.1     | 0.2                          |
| 18.  | Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH | mg/l  | <0.0005   | 0.001                        |
| 19.  | Copper as Cu   | mg/l  | < 0.01    | 0.05                         |
| 20.  | Manganese as Mn  | mg/l  | < 0.01    | 0.1                          |
| 21.  | Zinc as Zn   | mg/l  | 0.84      | 5.0                          |
| 22.  | Aluminum as Al   | mg/l  | < 0.01    | 0.03                         |
| 23.  | Boron as B   | mg/l  | < 0.1     | 0.5                          |
| 24.  | Sulphide as H <sub>2</sub> S                           | mg/l  | 0.051     | 0.05                         |
| 25.  | Anionic Detergents (as MBAS)                           | mg/l  | < 0.01    | 0.2                          |
| 26.  | Barium as Ba   | mg/l  | 1.16      | 0.7                          |
| 27.  | Chloramines (as Cl <sub>2</sub> )                      | mg/l  | <1.0      | 4.0                          |
| 28.  | Ammonia as total ammonia-N                             | mg/l  | < 0.01    | 0.5                          |
| 29.  | Mineral Oil  | mg/l  | < 0.01    | 0.5                          |
| 30.  | Selenium as Se   | mg/l  | < 0.005   | 0.01                         |
| 31.  | Silver as Ag   | mg/l  | < 0.01    | 0.1                          |
| 32.  | Cadmium as Cd  | mg/l  | <0.001    | 0.003                        |
| 33.  | Cyanide as CN  | mg/l  | <0.01     | 0.05                         |
| 34.  | Lead as Pb   | mg/l  | <0.01     | 0.01                         |
| 35.  | Mercury as Hg  | mg/l  | <0.001    | 0.001                        |
| 36.  | Molybdenum as Mo                                       | mg/l  | <0.01     | 0.07                         |



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|                       |   |           |              |                                 |
|-----------------------|---|-----------|--------------|---------------------------------|
| 37.                   | Nickel as Ni                                  | mg/l      | <0.01        | 0.02                            |
| 38.                   | Total Arsenic as As                           | mg/l      | <0.01        | 0.01                            |
| 39.                   | Total Chromium as Cr                          | mg/l      | <0.01        | 0.05                            |
| 40.                   | Polychlorinated biphenyls                     | mg/l      | <0.0001      | 0.0005                          |
| 41.                   | Polynuclear aromatic Hydrocarbons as PAH      | mg/l      | <0.0001      | 0.0001                          |
| <b>MICROBIOLOGY:</b>  |   |           |              |                                 |
| 42.                   | <i>E. coliforms</i>                           | CFU/100mL | Not detected | Shall not be detected in 100 ml |
| 43.                   | <i>Total coliforms</i>                        | CFU/100mL | 18           | Shall not be detected in 100 ml |
| 44.                   | <i>Faecal coliforms</i>                       | CFU/100mL | Not detected | -                               |
| <b>PESTICIDES:</b>    |   |           |              |                                 |
| 45.                   | Alpha HCH                                     | µg/l      | BDL          | 0.01                            |
| 46.                   | Beta HCH                                      | µg/l      | BDL          | 0.04                            |
| 47.                   | Butachlor                                     | µg/l      | BDL          | 125                             |
| 48.                   | Chlorpyrifos                                  | µg/l      | BDL          | 30                              |
| 49.                   | Delta HCH                                     | µg/l      | BDL          | 0.04                            |
| 50.                   | 2,4- Dichlorophenoxyacetic Acid               | µg/l      | BDL          | 30                              |
| 51.                   | DDT (o,p and p,p-Isomers of DDT, DDE and DDD) | µg/l      | BDL          | 1.0                             |
| 52.                   | Endosulfan (alpha, beta and Sulphate)         | µg/l      | BDL          | 0.4                             |
| 53.                   | Ethion  | µg/l      | BDL          | 3.0                             |
| 54.                   | Gamma-HCH (Lindane)                           | µg/l      | BDL          | 2.0                             |
| 55.                   | Isoproturon                                   | µg/l      | BDL          | 9.0                             |
| 56.                   | Malathion                                     | µg/l      | BDL          | 190                             |
| 57.                   | Methyl Parathion                              | µg/l      | BDL          | 0.3                             |
| 58.                   | Alachlor                                      | µg/l      | BDL          | 20                              |
| 59.                   | Atrazine                                      | µg/l      | BDL          | 2.0                             |
| 60.                   | Aldrin/ Dieldrin                              | µg/l      | BDL          | 0.03                            |
| 61.                   | Monocrotophos                                 | µg/l      | BDL          | 1.0                             |
| 62.                   | Phorate                                       | µg/l      | BDL          | 2.0                             |
| <b>TRIHALOMETHANE</b> |   |           |              |                                 |
| 63.                   | Bromoform                                     | mg/l      | <0.05        | 0.1                             |
| 64.                   | Dibromochloromethane                          | mg/l      | <0.05        | 0.1                             |
| 65.                   | Bromodichloromethane                          | mg/l      | <0.05        | 0.06                            |
| 66.                   | chloroform                                    | mg/l      | <0.05        | 0.2                             |

Note: All the above parameters are tested as per APHA methods, 23<sup>rd</sup> Edition, 2017

BDL- Below detectable limit, Detectable limit- <0.005 µg

CHECKED BY



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