BEFORE THE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH AT NEW DELHI

ORIGINAL APPLICATION NO. 691 OF 2022

IN THE MATTER OF:

RAMA SHANKER AWASTHI ….. APPLICANT(S)

VERSUS

STATE OF UTTAR PRADESH & ORS. …. RESPONDENT(S)

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FILED BY:

Bhishm

[SANJEEV KUMAR SINGH, BHISHM PRATAP SINGH & SHIGHRA KUMAR]
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NEW DELHI
Dated: 03.08.2024

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ORIGINAL APPLICATION NO. 691 OF 2022

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REPLY ON BEHALF OF THE RESPONDENT NO. 7/ BAJAJ ENERGY LIMITED.

MOST RESPECTFULLY SHOWETH:

A. BACKGROUND:

I. On 27.09.2022 this Hon'ble Tribunal was pleased to direct constitution of a Joint Committee of UPPCB and CPCB, to file its Report with respect to the Thermal Power Plant of Bajaj Hindusthan Sugar Limited (Respondent No.6) and Bajaj Energy Limited (Respondent No.7) at Lakhimpur Kheri, U.P.

II. On 04.01.2023, a report was filed by the said Joint Committee with regard to the Power Plant run by the answering Respondents at Lakhimpur Kheri.

III. On 20.01.2023, this Hon'ble Tribunal directed that Report with regard to all other 9 plants (in all 10) at different locations running in U.P. should also be included in the Report.

IV. On 10.02.2023, a detailed Joint Committee Report was filed with regard to all the 10 Units of the answering Respondent.

V. On 13.02.2023, this Hon'ble Tribunal considered the said Report dated 10.02.2023 and directed UPPCB to secure compliance within the stipulated time frame and left it open to the Applicant to point any violations to UPPCB. A gist of the Report; and recommendations, with regard to all the 10 units was recorded in the said Order.

VI. On 04.10.2023, in a Review Application filed by the Applicant, seeking review of the order dated 13.02.2023, this Hon'ble Tribunal was pleased to issue Notice and directed the Respondents to file their Reply.

VII. On 06.11.2023, answering Respondent, i.e. Respondent No.7 filed its detailed Reply showing compliance of all the recommendations of the JCR.

VIII. On 08.11.2023, UPPCB filed a Reply in the said Review Application. The said Reply was a detailed Reply which gave up to date status of - *each of the Unit; date of its inspection; recommendation in the JCR dated 10.02.2023; action taken by UPPCB; and the current status of Compliance by the answering Respondents*. ***[Please refer Page 888 to 1106]***

IX. On 21.12.2023, the aforesaid Review Application filed by the Applicant was allowed by this Hon'ble Tribunal and the Original Application was restored to its original number and this Hon'ble Tribunal further allowed the Applicant to file its response to the Report dated

10.02.2023. It also allowed the answering Respondents to file their responses to the same.

X. On 13.02.2024, the Applicant filed its Objections to the JCR dated 10.02.2023. ***[Please refer Page 1123 to 1137]***

XI. The answering Respondents No.7, Bajaj Energy Limited is accordingly filing the present response. Mr. Arun Garg (Assistant Vice President, Finance & Accounts) is the authorised representative of the answering Respondent company and has been duly authorized to represent the present case before this Hon'ble Tribunal vide Board resolution dated 29.12.2022. A true copy of the Board resolution dated 29.12.2022 issued by the answering Respondent authorising Mr. Arun Garg (Assistant Vice President, Finance & Accounts) to represent the present case before this Hon'ble Tribunal is being annexed herewith and marked as **ANNEXURE-R-1.**

SUBMISSIONS WITH REGARD TO THE RECOMMENDATIONS OF THE JOINT COMMITTEE REPORT DATED 10.02.2023

1. In view of the recommendations made by the Joint Committee in its report dated 10.02.2023 the answering respondent has duly complied with said directions and recommendations. The compliance status of the Recommendations made by the Joint Committee appointed by this Hon'ble Tribunal and the compliances done by the answering Respondent in accordance with the order dated 13.02.2023 of this Hon'ble Tribunal are as follows:

A. Recommendation #1 (Common for all the 5 Power Plants of M/s Bajaj Energy Limited):

I. The unit has to install spiral ladder for the monitoring of flue gas emission as per CPCB guideline.

COMPLIANCE STATUS: COMPLIED

1. In compliance with the direction given by the Joint Committee, spiral ladder has been installed in the stack of all the 5 Power Plants of M/s Bajaj Energy Limited.

2. The spiral ladder installation status updates and final completion status have already been submitted by the answering Respondent to the Member Secretary and Regional Offices of the UPPCB vide letters dated 21.08.2023, 25.09.2023 and 16.10.2023. True copies of the letters dated 21.08.2023, 25.09.2023 and 16.10.2023 sent by the answering Respondent to the Member Secretary, UPPCB, Lucknow showing the installation of spiral ladder in the stack of all the 5 power plants of the answering Respondent are being annexed herewith and marked as **ANNEXURE-R-2 (Colly).**

Recommendation #2 (Specific to M/s Bajaj Energy Pvt. Ltd., Village-Khambharkhera, Tehsil- Kheri, Distt.- Lakhimpur Kheri UP):

I. The unit has to develop dedicated storage shed for the storage of contaminated drums and wax as per Hazardous Waste (Management and Transboundary movement) Rules 2016.

II. UPPCB vide letter dated 10.02.2023 has imposed Environmental Compensation Rs.3,50,000/- (Rs. Three Lac Fifty Thousand only) against the unit in compliance of the recommendation of Joint Committee Report Dated 21.12.2022 and 22.12.2022.

COMPLIANCE STATUS: COMPLIED

1. That the answering Respondent/BEL Khamberkhera Unit is in strict compliance with the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended and the Management of Hazardous Waste is being done as per the applicable guidelines only. The Unit has a well-maintained Hazardous Waste storage shed/ separation dykes/garland drain and spill collection pit since beginning, to prevent any seepage/leakage outside Hazardous Waste Storage Area. The Unit is also having a valid TSDF membership of M/s Bharat Oil and Waste Management Limited, Kanpur. All the related compliance reports have been submitted to the Board well in time. In addition, this Hazardous Waste Storage facility has always been inspected by the UPPCB officials, especially while granting / renewing Hazardous Waste Authorization for the plant. During the inspection by the Joint committee, the Hazardous Waste Storage Facility at site had been shown to the team and it is registered too, but the committee had mentioned that there is no Hazardous Waste Storage Facility at site and noted it as a non-compliance in their report.

2. The reply to all the notices issued in this regard was also submitted suitably and timely to the Chief Environmental Officer, UPPCB, Lucknow by the answering Respondent/BEL vide letters dated 20.01.2023 & 07.02.2023. True copies of the letters dated 20.01.2023 & 07.02.2023 along with its enclosures sent by the answering Respondent/BEL to the Chief Environmental Officer, UPPCB, Lucknow are being annexed herewith and marked as **ANNEXURE-R-3 (Colly).**

3. However, considering the order and judgment dated 13.02.2023 of this Hon'ble Tribunal in the matter, the answering Respondent/BEL has deposited, under protest, an amount of Rs. 3.5 Lakh (Rs. Three Lakh Fifty Thousand only) as an Environmental Compensation imposed erroneously on the Khamberkhera Unit vide letter dated 03.03.2023 to the Member Secretary, UPPCB, Lucknow. True copies of the letter dated 03.03.2023 along with its enclosure sent by the answering Respondent/BEL to the Member Secretary, UPPCB, Lucknow showing the payment of the penalty imposed for Khambharkhera unit are being annexed herewith and marked as **ANNEXURE-R-4 (Colly).**

OBSERVATION MADE BY THIS HON'BLE TRIBUNAL VIDE ORDER DATED 13.02.2023:

A. No information has been provided as to how thermal power stations are laying closed as per common understanding, such plants are never closed completely. State PCB may checkup this aspect.

SUBMISSION ON BEHALF OF THE ANSWERING RESPONDENT:

I. It is humbly submitted that Bajaj Energy Power Plants operate as per the Schedule issued by the UP-State Load Dispatch Centre (UPSLDC). UPSLDC keeps on instructing BEL to operate / shutdown Power Plant as per the load demand of Uttar Pradesh. This was the reason that, during the inspection, the Power Plants of the answering Respondent/BEL were under reserved shutdown due to low power demand in the State of Uttar Pradesh. This information has also been submitted to the UPPCB vide letters dated 27.02.2023 & 03.03.2023. True copies of the letters dated 27.02.2023 and 03.03.2023 sent by the answering Respondent/BEL to the Chief Environmental Officer, UPPCB, Lucknow explaining the reason as to why the Thermal Power Plants were not operational when the Joint committee visited for inspection is being annexed herewith and marked as **ANNEXURE-R-5 (Colly).**

1. The allegation that the answering Respondent has extracted ground water for more than a year without prior permission from Ground Water Department is factually incorrect. It is categorically stated that the answering Respondent had obtained due permission from the Ground Water Department vide dated 04.02.2010 for extraction of Ground Water. Thereafter the said permission has been renewed from time to time. The answering Respondent is placing on record copies of the permissions granted to the answering Respondent by the concerned authorities in this regard. A bare perusal of these permissions would show and demonstrate

that the answering Respondent has never extracted ground water without prior permission, as is being sought to be alleged by the Applicant. In view of the fact that the concerned authority had duly permitted the answering Respondent to extract ground water, there is no occasion for the said authorities to take any action against the answering Respondent. The allegation as such is ex facie false. The Applicant is only attempting to mislead this Hon'ble Tribunal by raising false allegations against the answering Respondent.

2. It is stated that the answering Respondent initially obtained permission for extracting ground water through 2 borewells. The said permission was granted on 04.02.2010 and continued till 2021. W.e.f. 2021, the answering Respondent was granted permission to extract ground water through 3 borewells. Pertinently a perusal of the permission granted to the answering Respondent from time to time would show and demonstrate that the said permissions also specified the permitted quantities of ground water which could be extracted by the answering Respondent. The answering Respondent is placing on record various Audit Reports to show that at no point of time the rate of extraction of ground water has ever exceeded the permitted quantities. Furthermore, the Applicant has falsely alleged that the answering Respondent has neither undertaken any audit nor filed any audit report before the concerned authorities. Whereas the answering Respondent is filing copies of the Audit Reports filed with the concerned authorities from time to time. It is pertinent to note here that vide Notification dated 24.09.2020, issued by the Ministry of Jal Shakti, the answering

Respondent was initially obligated to carry out annual Audit. Thereafter, vide Notification dated 29.03.2023, issued by the Ministry of Jal Shakti, the answering respondent is obligated to carry out Audit every two years and the answering Respondent has duly complied with the same. The allegation as such is ex facie false. The Applicant is only attempting to mislead this Hon'ble Tribunal by raising false allegations against the answering Respondent.

True Copies of the Audit Reports filed by the answering Respondent with the concerned authorities for the period 2018 to 2020 are being annexed hereto as **ANNEXURE-R-6 (Colly).**

True copy of the Notification dated 24.09.2020 issued by Ministry of Jal Shakti is being annexed hereto as **ANNEXURE- R-7.**

True Copy of the Notification dated 29.03.2023 issued by Ministry of Jal Shakti is being annexed hereto as **ANNEXURE- R-8.**

RESPONSE TO THE OBJECTIONS DATED 13.02.2024 OF THE APPLICANT.

3. At the very outset the Respondent No. 7/ Bajaj Energy Limited (hereinafter referred to as the "answering respondent") submits that, save as would appear from the records or otherwise categorically and specifically admitted, each and every contention, allegations, statements and or assertions made by the Applicant in the so called objections dated 13.02.2024, are being specifically denied as false and incorrect.

4. That the Applicant has deliberately adopted a pick and chose strategy to misrepresent and knowingly misinterpret various portions of the Joint Committee Reports dated 04.01.2023 and 10.02.2023 and in doing so,

the Applicant has made false allegations against the answering Respondent.

5. The Applicant has vide its objections dated 13.02.2024 attempted to portray a false narrative by referring to bits and parts of the Joint Committee Reports dated 04.01.023 and 10.02.2023 that, the answering Respondent has operated its units;

FIRSTLY, without obtaining valid consents/renewal with regard to ground water extraction; and
SECONDLY, without obtaining valid consent/approval for handling of hazardous wastes.

SUBMISSIONS ON THE ALLEGATIONS THAT THE ANSWERING RESPONDENT HAS OPERATED ITS UNITS WITHOUT OBTAINING THE VALID CONSENTS/RENEWAL WITH REGARD TO GROUND WATER EXTRACTION:

6. It is submitted that at the time of setting up and establishing a new sugar unit alongwith Cogeneration plant, the answering Respondent had applied for Ground Water clearance to Central Ground Water Authority (CGWA) Ministry of Water Resources, New Delhi.

7. Pertinently, the units of the answering Respondent situated at Barkhera District- Pilibhit, Maqsoodpur District- Sahjahanpur, Khambharkhera District -Lakhimpur Kheri, Kundarkhi District-Gonda and Utraula District -Balrampur were falling in Safe area (Non-Notified area) and as per CGWA guidelines prevailing at that time and as mentioned in above CGWA letters Ground water withdrawal NOC was not required as per CGWA Ministry of Water Resources New Delhi.

8. On 04.10.2017 the Central Ground water Authority Ministry of Water Resources, River Development and Ganga Rejuvenation vide their Public Notice no 26-1/CGWA/2015 published that CGWA, in exercise of Power under section 5 of the Environment (Protection) Act , directed all such users who were exempted from requirement of NOC were now directed to apply for the NOC for ground water extraction by 31st December 2017.

   Copy of the Public Notice dated 04.10.2017 issued by CGWA is annexed hereto as **ANNEXURE R-9.**

9. On 29.06.2018 the Central Ground Water Authority Ministry of Water Resources, River Development and Ganga Rejuvenation vide their Public Notice no 26-1/CGWA/PN/2018 published that due to ongoing modifications in existing guidelines and to address the grievances of many ground water users in the country, it is considered necessary- and expedient to extend the due date for the submissions of online application through NOCAP up to 30.09.2018.

   Copy of the Public Notice dated 29.06.2018 issued by CGWA is annexed hereto as **ANNEXURE R-10.**

10. On 01.04.2020 the Ministry of Jal Shakti department of Water Resources, River development and Ganga Rejuvenation Central Ground Water Authority had issued public Notices regarding prevailing situations of lockdown in the entire country due to Covid-19 the date for submission of application for NOC for ground water abstraction by existing

industries, infrastructure and mining projects is hereby extended till 30th June 2020.

A copy of the Public Notice dated 01.04.2020 issued by Ministry of Jal Shakti, is annexed hereto as **ANNEXURE R-11.**

11. Although answering Respondent had accordingly applied for renewal of water drawl NOC on NOCAP portal of CGWA. However, subsequently, CGWA published a notice on its website that Government of Uttar Pradesh had started a new online portal for Ground water NOC and hence CGWA NOCAP portal had stopped processing of already existing applications, as well as accepting fresh and renewal applications for Projects in the state of Uttar Pradesh.

A copy of the Public Notice published by CGWA on its website, is annexed hereto as **ANNEXURE R-12.**

12. On 06.10.2020, Uttar Pradesh Ground water (Management and Regulation) act 2019 was amended whereby it was directed that *"Any existing commercial or Industrial or Infrastructure or bulk user, who has sunk a well for extracting or using ground water in notified area or non-notified area before the date of coming into force of the act , and has valid No Objection Certificates issued by either Central Ground water Authority or by Ground water Department , Uttar Pradesh for extracting or using ground water , shall make an application within period of one year from the date of coming into force of the rule."*

A copy of the Notification dated 06.10.2020 issued by Government of Uttar Pradesh, is annexed hereto as **ANNEXURE R-13.**

13. Accordingly, answering Respondent applied for and has been granted NOCs for ground water extraction till date. The details of NOCs issued by Ground Water Department Ministry of Jal Shakti Government of Uttar Pradesh is as follows-

SNo.	**Unit Name**	**Date of filing Application**	**Date of Issuance of NOC**	**Validity of NOC**	**Annexed as**
1	Barkhera Pilibhit	06.06.2021	23.06.2021	22.06.2026	**Annexure R-14 Colly**
2	Maqsoodpur Shahjahanpur	15.07.2021	21.08.2021	20.08.2026	**Annexure R-15 Colly**
3	Khambharkhera Lakhimpur Kheri	28.06.2021	25.07.2021	24.07.2026	**Annexure R-16 Colly**
4	Kundrkhi Gonda	04.06.2021	18.06.2021	17.06.2026	**Annexure R-17 Colly**
5	Itai Maida Utraula Balrampur	01.07.2021, 16.08.2021	18.10.2021, 06.09.2021	17.10.2026, 05.09.2026	**Annexure R-18 Colly**

14. It is submitted that the aforesaid facts and circumstances and the documents placed on record by the answering Respondent show and demonstrate that the answering Respondent has not violated any provisions of the environmental laws and has rather acted in a bonafide manner and has applied for and obtained the requisite NOCs/consents/approvals as per the prevailing guidelines and Rules prescribed by the concerned authorities. The allegation of the Applicant in this regard is therefore false and does not hold any merit.

15. In reply to the allegation that the answering Respondent has sunk in 3 borewells instead of two borewells without any NOC, it is submitted that the allegation is false and incorrect. The answering Respondent has not sunk 3 borewells instead of two as alleged or at all.

16. In reply to the allegation that there is no mention of location of the well in the majority of the NOC certificates issued by Ground Water Department, Uttar Pradesh and hence there is suspicion that answering Respondent has sunk well at various locations without informing the concerned departments, it is submitted that the suspicion of the Applicant is whimsical and unwarranted in as much as the answering respondent has not sunk well at various locations as alleged.

17. In reply to the allegation that there is no information qua renewal if EC granted by USEIAA after period of 5 years, it is submitted that as per the Environment Impact Assessment Notification 2006, as amended from time to time, the “Validity of Environmental Clearance” is meant the period from which a prior Environmental Clearance is granted by the regulatory authority, or may be presumed by the applicant to have been granted under sub-paragraph (iii) of paragraph 8 of the said Notification, till start of production operations by the project or activity; or completion of all construction. In the present case no further extension of Environment Clearance was required as the answering Respondent had completed commercial operation of the subject matter units before the expiry of the first Environmental Clearance granted to the answering Respondent as would be clear from the following table:

SNO	Unit	Date of grant of Environmental Clearance	Date of Commercial Operation
1	Barkhera	09.07.2010	24.03.2012
2	Maqsoodapur	09.07.2010	28.03.2012
3	Khamberkhera	09.07.2010	03.02.2012
4	Kundarkhi	09.07.2010	21.04.2012
5	Utraula	09.07.2010	24.04.2012

A copy of the Environment Impact Assessment Notification 2006 is annexed hereto as **ANNEXURE R-19.**

SUBMISSIONS ON THE ALLEGATIONS THAT THE ANSWERING RESPONDENT HAS OPERATED ITS UNITS WITHOUT OBTAINING THE VALID CONSENTS/RENEWAL WITH REGARD TO HANDLING OF HAZARDOUS WASTE:

18. It is submitted that the answering Respondent is regularly obtaining Authorisations under the provisions of Hazardous and Other Waste (Management and Transboundary Movement) Rules.

19. It is therefore submitted that the allegations made by the Applicant are ex facie false and the answering Respondent has duly applied for and has been also granted requisite approvals/NOCs from the concerned authorities qua handling of hazardous wastes.

20. In such circumstance the answering Respondent humbly prays for the dismissal of the present Application with exemplary costs and in the interest of justice, keeping in view the compliances and the steps undertaken by the answering Respondent to comply with the recommendation of the Joint Committee reports and the fact that there is

no violation as alleged by the Applicant in the above titled Application/objections.

BAJAJ ENERGY LTD.

RESPONDENT NO.7

FILED BY:

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NEW DELHI
Dated: 03.08.2024

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VERSUS

STATE OF UTTAR PRADESH & ORS. ....RESPONDENT(S)

AFFIDAVIT

I, Arun Garg, S/o Sh. M. K. Garg, aged about 46 years, having Regd. Office at: Khambarkhera, Shardanagar Road, Kheri, Lakhimpur, Uttar Pradesh-261506, presently at New Delhi, do hereby solemnly affirm and state as under:

1. That I am the (Assistant Vice President, Finance & Accounts) and the authorized representative of the Respondent No.7 M/s. Bajaj Energy Ltd. and I have been duly authorized to file the present affidavit.

2. That being the authorised representative of the Respondent No. 7 Company, I am well conversant with the facts and records of the case and therefore, competent to swear this affidavit.

3. I have read and understood the contents of the Reply on behalf of the Respondent No. 7/ Bajaj Energy Limited to the objections dated 13.02.2024 filed by the Applicant which has been drafted as per my instructions and state that the contents thereof are true as per the verification.

NOTARY Debajyoti Bhuria Advocate Regn No. 19716 Period: 24/02/2020 to 24/02/2025 Central Delhi GOVT. OF INDIA

DEPONENT

I identified the deponent who has signed in my presence

03 AUG 2024

VERIFICATION:

I, Arun Garg, the deponent above named, do hereby verify declare that the contents of paras 1 to 3 of the above affidavit are true to my personal knowledge and that I have not suppressed any material facts.

Verified at New Delhi on this ___ day of August 2024.

DEPONENT

CERTIFIED THAT THE DEPONENT S/Smt./Km. Arun S/o, W/o, D/o. M.K. Garg ... Identified by Shri/Smt. Sajeen Kumar Adv. ... has Solemnly affirmed before me at New Delhi on ... as Sl. No. 20 ... that the Contents of the affidavit which have been read & explained to him are true and correct to this knowledge.

03 AUG 2024

Notary Public

bajaj ENERGY

ANNEXURE-R-1

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF BAJAJ ENERGY LIMITED AT ITS MEETING HELD ON DECEMBER 29, 2022

"RESOLVED THAT the following Officers ("Authorized Officers") of the Company, viz:

Sl. No.	Name	Present Designation
1	Mr. Govind Maheshwari	Chief Financial Officer
2	Mr. Arun Garg	Assistant Vice President (Finance & Accounts)

be and are hereby severally authorised for and on behalf of the Company to exercise the following powers in respect of all or any of the matters related to the Company in Supreme Court of India, High Courts, and any other Courts/Tribunals/ Arbitration:-

a) To file petition, suits, application, replies on any issue related to the Company and represent the Company in such proceedings;

b) To institute, conduct, defend, refer to arbitration or other proceedings, claims and disputes in which the Company is or may be concerned or interested and to represent, appear and act in before the aforesaid Courts;

c) To sign and verify plaints, vakalatnamas, written statements, rejoinders, petitions, notices, claims, objections, appeals and application of all kinds to file them in any of the aforesaid Courts;

d) To appoint pleaders, attorneys, advocates, solicitors or other representatives for the purpose of aforesaid;

e) Generally to do and cause to be done all such incidental and other acts, deeds and things and execute and cause to be executed all such other documents, instruments, writings, papers, applications, etc. as may be required or necessary for complying with the law relating above acts as it applies; and

f) All such acts done by him will be binding on the Company and they be and are hereby ratified by the Company."

"RESOLVED FURTHER THAT a copy of the foregoing resolution certified to be true by any one of the Directors/Key Managerial Personnel be furnished to the concerned authorities and shall remain in force until the written notice/intimation for its revocation is given by the Company to such authorities."

\\Certified True Copy\\
For **Bajaj Energy Limited**

Alok Desai
Company Secretary
Membership No.: FCS 10518

BAJAJ ENERGY LTD.

bajaj ENERGY

ANNEXURE-R-2

(Colly)

Ref: - BEL/Dir/EHS/2023-24

Dated: 21.08.2023

To,

The Member Secretory
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others

Ref: Order issued by Hon'ble National Green Tribunal (NGT) in OA 691/2022 vide dated 13.02.2023

Dear Sir,

In compliance to the order issued by Hon'ble NGT against OA 691/2022 vide dated 13.02.2023 and undertaking submitted by BEL power plants on completing Chimney Spiral Ladder installation by 30.09.2023, we would like to inform you that **Spiral Ladder Installation work at Barkhera Power Plant located in District Pilibhit has been completed on 15.08.2023.** Work completion photograph is attached as **Annexure-1.**

Further, the status of ladder installation at Five Power Plant of Bajaj Energy at different locations are as under:

SN	BEL Power Plants	Work Completion Status		
		Civil Foundation	Ladder Fabrication	Installation
1	Barkhera (Pilibhit)	Completed	Completed	Completed
2	Maqsoodapur (Shahjahanpur)	Completed	Completed	After Fabrication
3	Kundarkhi (Gonda)	Completed	Under Progress	After fabrication
4	Khambarkhera (Lakhimpur)	Completed	Under progress	After Fabrication
5	Utraula (Balrampur)	Under progress	Under Progress	After fabrication

The installation work at aforementioned Power Plants will be completed as per the schedule. The photographs showing work completion status at referred 4 power plants are attached vide **Annexure – 2.**

Submitted for your kind information & record please.

Thanking you

Yours Faithfully

For Bajaj Energy Ltd.,

(Authorized signatory)

Encl: As Above

डाक प्राप्ति रसीद
प्राप्ति दिनांक 21.08.23
प्राप्तकर्ता के हस्ताक्षर
उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ

Bajaj Energy Ltd
ISO 9001, ISO 14001 & OHSAS 18001 Certified
Noida Office: Bajaj Bhawan, B-10, Sector-3, Jamnalal Bajaj Marg, Noida 201 301, Uttar Pradesh
Tel: +91 120 2444611 Fax: +91 120 2534285
Registered Office: Khambarkhera, Shardanagar Road, Lakhimpur Kheri - 261 504, Uttar Pradesh
Tel: +91 5872 220006 | Fax: +91 5872 220034 | CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

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Annexure-1



Spiral Lader Installation at Barkhera

Annexure -2



Maqsoodapur – Fabrication Work



Kundarkhi – Foundation Work



Khambarkhera – Fabrication Work



Utraula – Foundation Work

bajaj ENERGY

Ref: - BEL/Dir/EHS/2023-24/02

Dated: 25.09.2023

To,
The Member Secretory
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others
Ref: Order issued by Hon'ble National Green Tribunal (NGT) in OA 691/2022 vide dated 13.02.2023

Dear Sir,

In compliance to the order issued by Hon'ble NGT against OA 691/2022 vide dated 13.02.2023 and undertaking submitted by BEL power plants on completing Chimney Spiral Ladder installation by 30.09.2023, we would like to submit the updated status of **Spiral Ladder Installation work at our all 5 BEL Plants** which are as under. Work completion photographs are attached as **Annexure-1.**

SN	BEL Power Plants	Work Completion Status		
		Civil Foundation	Ladder Fabrication	Installation
1	Barkhera (Pilibhit)	Completed	Completed	Completed
2	Maqsoodapur (Shahjahanpur)	Completed	Completed	Completed
3	Kundarkhi (Gonda)	Completed	Completed	Completed
4	Utraula (Balrampur)	Completed	Completed	Completed
5	Khambarkhera (Lakhimpur)	Completed	Completed	**Under progress**

Submitted for your kind information & record please.

Thanking you

Yours Faithfully,
For Bajaj Energy Ltd.,

Amitosh

(Authorized signatory)

Encl: As Above

Copy to:
1. Chief Environmental Officer (Circle – 5), UPPCB, Lucknow
2. Chief Environmental Officer (Circle-6, UPPCB, Lucknow
3. Chief Environmental Officer (Circle – 7, UPPCB, Lucknow
4. Regional Officer (Bareilly), UPPCB, Uttar Pradesh
5. Regional Officer (Lucknow), UPPCB, Uttar Pradesh
6. Regional Officer (Ayodhya), UPPCB, Uttar Pradesh
7. Regional Officer (Basti), UPPCB, Uttar Pradesh

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Noida Office: Bajaj Bhawan, B-10, Sector-3, Jamnalal Bajaj Marg, Noida 201 301, Uttar Pradesh
Tel: +91 120 2444419 Fax: +91 120 2534265
Registered Office: Khambarkhera, Shardanagar Road, Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel: +91 5872 220006 | Fax: +91 5872 220034 | CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

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Annexure – 1

BEL Kundarkhi



BEL Barkhera



BEL Maqsoodapur



BEL Utraula



BEL Khambarkhera



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Ref: - BEL/Dir/EHS/2023-24/03 Dated: 16.10.2023

To,
The Member Secretory
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others
Ref: Order issued by Hon'ble National Green Tribunal (NGT) in OA 691/2022 vide dated 13.02.2023

Dear Sir,

In compliance to the order issued by Hon'ble NGT against OA 691/2022 vide dated 13.02.2023 and undertaking submitted by BEL power plants on completing Chimney Spiral Ladder installation by 30.09.2023, we would like to submit that the Spiral Ladder Installation work at our all 5 BEL Plants has been completed as per the schedule. Work completion photographs are attached as **Annexure-1.**

SN	BEL Power Plants	Work Completion Status		
		Civil Foundation	Ladder Fabrication	Installation
1	Barkhera (Pilibhit)	Completed	Completed	Completed
2	Maqsoodapur (Shahjahanpur)	Completed	Completed	Completed
3	Kundarkhi (Gonda)	Completed	Completed	Completed
4	Utraula (Balrampur)	Completed	Completed	Completed
5	Khambarkhera (Lakhimpur)	Completed	Completed	Completed

Submitted for your kind information & record please.

Thanking you

Yours Faithfully,
For Bajaj Energy Ltd.,

Amitosh

(Authorized signatory)

Encl: As Above

Copy to:
1. Chief Environmental Officer (Circle – 5), UPPCB, Lucknow
2. Chief Environmental Officer (Circle-6, UPPCB, Lucknow
3. Chief Environmental Officer (Circle – 7, UPPCB, Lucknow
4. Regional Officer (Bareilly), UPPCB, Uttar Pradesh
5. Regional Officer (Lucknow), UPPCB, Uttar Pradesh
6. Regional Officer (Ayodhya), UPPCB, Uttar Pradesh
7. Regional Officer (Basti), UPPCB, Uttar Pradesh

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Annexure – 1

BEL Kundarkhi



BEL Barkhera



BEL Maqsoodapur



BEL Utraula



BEL Khambarkhera



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ANNEXURE-R-3

(Colly)

Ref. No. BEL/KKH/NGT/02-2023 January 20, 2023

To,

The Chief Environmental Officer
Circle-5,
Uttar Pradesh Pollution Control Board,
TC-12 V, Vibhuti Khand,
Gomti Nagar, Lucknow

Sub: Regarding compliance of Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others

Dear Sir,

With reference to the Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we would like to inform you that we have already constructed Hazardous Waste Storage shade as per the guidelines mentioned in Hazardous Waste Management and Transboundary Rules 2016 and the hazardous waste is being disposed as per the guidelines mentioned in the Rule through TSDF.

Membership Certificate alongwith some photographs are attached herewith as annexure 1 & 2 for your information.

Thanking you,

Yours faithfully,
For Bajaj Energy Ltd.
Unit: Khamberkhera, Lakhimpur Kheri (UP)

for Rajwant

(Authorized Signatory)

End.: As above

Copy to:

1. The Member Secretary, UPPCB, Lucknow
2. The Regional Director (Central Region), CPCB, Lucknow
3. The Regional Officer, UPPCB, Lucknow

Annexure – 1

Bharat Oil & Waste Management Ltd.

Petroleum Refining, Hazardous Waste Management & Incineration
Refiners & Manufacturers of Industrial Lubricating Oils

MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

BOWML/K/3785/20

Gata No. 672,706Cha Vill. Kumbhi,Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

BOWML/K/3785/20

One may verify 'active' membership by calling
Bharat Oil & Waste Management Ltd. at
011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

For **Bharat Oil & Waste Management Ltd.**

Pragati Rohtagi
Sales Cordinator
sales@bharatoil.com
Digitally Signed By Pragati Rohtagi
Date: 2022-12-22 09:52:09
IP: 49.36.182.174
ID: 6nWeBEbKFTRdUURIA==
Click here to E-verify

Authorized Signatory

For **Bharat Oil & Waste Management Ltd.**

Surinder K Kukreja
GM (Admin & Fin.)
sales@bharatoil.com
Digitally Signed By Surinder K Kukreja
Date: 2022-12-22 09:50:39
IP: 49.36.182.174
ID: UGxlPmP JQdlwYUaVlwTvqpG==
Click here to E-verify

Authorized Signatory

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065. India
Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41000710, 26210205 Telefax : 26216466
Email : sales@bharatoil.com www.bharatoil.com

Facilities :
- E - 18, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Makimpur Roorkee-Lakshar Road Roorkee - 247664 (UK)
- SIDCUL - Haridwar (UK)

Annexure – 2


HAZARDOUS
WASTE
STORAGE
AREA
E-WASTE
USED
BATTERY
USED
OIL


HAZARDOUS
WASTE
STORAGE
AREA
E-WASTE
USED
BATTERY
USED
OIL

bajaj ENERGY

Ref: BEL/Show Cause/2023 **Date:** 07.02.2023

To,
The Chief Environmental Officer (Circle 5),
Uttar Pradesh Pollution Control Board,
TC-12V Vibhuti Khand, Gomti Nagar,
Lucknow- 226010

Subject: Regarding show cause notice dated 25.01.2023 issued to Bajaj Energy Ltd., Khambharkhera, Lakhimpur Kheri U.P. Unit.

Ref: UPPCB *letter No.42/CEO CAMP/C-5/JAI-132/23 Dated: 25.01.2023.*

Dear Sir,
This has reference to above mentioned show cause notice received by us on 30.01.2023. In this regard we would like to submit that, we are in strict compliance with all the conditions mentioned in the Hazardous Waste Authorization issued by the Board vide no. 13700/UPPCB/Lucknow(UPPCBRO)/HWM/Lakhimpurkheri/2021 date 28.02.2021 valid till 02.03.2026. The compliance reports of the same is enclosed as **annexure-1**.
In Furtherance to above, our submissions are as under-

Reply to the Letter no. 2151/consent-588 C/2023 dated 04.01.2023: In this regards we humbly appraise you that the said letter has not been received at our unit till date, though we have already submitted the compliance status of all the directions issued by the Hon'ble NGT on 20.01.2022 through email. The screenshot of the same is enclosed as **annexure-2.**

We are a reputed corporate organization and very much sincere to comply with the directions/orders issued by the authorities. We are submitting the replies of all the received letters/direction/notices well within the stipulated time limits.

Regarding Environmental Compensation: In this matter, it is pertinent to mention that strict compliance with the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended is ensured. The storage and Handling of Hazardous Waste is being done as per the Schedule-8, 16, 17, 18 & 19 of Hazardous and other Wastes Management Rule., 2016. We have a well maintained hazardous waste storage shed/ separation dykes/garland drain and spill collection pit, since our power plant operation, to prevent any seepage/leakage outside Hazardous Waste Storage Area. The Photographs of the same are enclosed as **annexure-3. The** Hazardous Waste Storage facility has always been inspected by the UPPCB officials, especially while granting / renewing Hazardous Waste Authorization for the plant.

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office : Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel:+91 5872 220006 Fax: +91 5872 220034
CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

bajaj ENERGY

Additionally, the disposal of the waste is being done through authorized TSDF facility, the copy of the TSDF certificate is enclosed as **annexure-4.**

During the inspection by the Hon'ble NGT committee, this hazardous waste storage facility at site has been shown to the team and it is registered also but in the report somehow it is missed, it seems.

Based on above evidences, we would like to state that the unit has not violated any guidelines of Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016, and there is no any adverse/unsafe environmental conditions like leakage/seepage, soil/land contamination, Surface water, ground water contamination found, so there is no chance of any adverse environmental impact and also any health hazard to nearby inhabitants, flora & fauna. The ground water and soil analysis reports are enclosed as **annexure-5.**

In the light of above fact, we would like to request your good-self to kindly revoke the said Show Cause notice, as we are in strict compliance with the guidelines of Hazardous waste management and having a proper storage and disposal facilities since the power plant operation.

We once again assure you that, we are sincere to conserve our environment and conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing unit and will always remain so.

Thanking you,

Yours Faithfully,
For Bajaj Energy Ltd.,
Unit – Khmabharkhera

(Authorized Signatory)
Encl: As Above
CC To:

- The District Magistrate, Lakhimpur
- The Regional officer, UPPCB, Lucknow

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office : Khambarkhera, Shardanagar Road,
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bajaj ENERGY

Ref: BEL/KKH/HWM/EHS/23/73

February 07, 2023

To,
The Chief Environment Officer, Circle-5
Uttar Pradesh Pollution Control Board
Tc-12V, Vibhuti Khand, Gomti Nagar,
Lucknow-226010

Sub: Compliance Report of Authorization issued under the provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 reference No. **13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021** dated 28/01/2021 for M/s Bajaj Energy Ltd, Khambhar khera, Lakhimpur Kheri (UP).

Dear Sir,
The pointwise compliance report is as under-

Sl.	Conditions	Compliance Status
1	The authorised person shall comply with the provisions of the Environment (Protection Act, 1986, and the rules made there under.	Being Compiled.
2	The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the State Pollution Board.	Noted for Compliance.
3	The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.	Noted for Compliance.
4	Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorisation.	Noted for Compliance.
5	The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.	Emergency Response Procedure (ERP) is in place. Regular Mock drills are carried out.
6	The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and penalty.	Being Complied.

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel:+91 5872 220006 Fax +91 5872 220034
CIN: U40102UP2008PLC046764 | Web www.bajajenergy.com

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7	It is the duty of the authorised person to take prior permission of the State Pollution Control Board to close down the facility.	Noted for Compliance
8	The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.	Not Applicable
9	The record of consumption and fate of the imported hazardous and other wastes shall be maintained.	Not Applicable
10	The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilisation of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorisation.	Not Applicable
11	The importer or exporter shall bear the cost of Import or export and mitigation of damages if any	Not Applicable
12	An application for the renewal of an authorisation shall be made as laid down under these Rules.	Note for Compliance.
13	Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Changes or Central Pollution Control Board from time to time.	Note for Compliance.
14	Annual return shall be filed by June 30th for the period ensuring 31st March of the year.	Annual Return is always filled well within time. Annual Return for FY 2021-22 (Form-4) is attached as **Annexure-1**
15	The Unit will file the renewal application at least 2 months prior to the expiry of this Order.	Noted for Compliance.
Specific Conditions		
Sl.	**Conditions**	**Compliance Status**
1	Board has issued earlier HWM Authorization vide letter no-4477/UPPCB/Lucknow(UPPCBRO)/ HWM/LAKHIMPUR KHERI/2018 Dated 28.09.2018is herby revoked.	Noted.
2	The authorization shall be valid for a period of Five Years from the date of issue, if not suspended or cancelled earlier.	Noted.
3	The wastes must be safely collected in leak proof containers and shall be duly marked in a manner suitable for handling, storage and transport and the packaging shall be easily visible and be able to withstand physical conditions and climatic factors. All hazardous waste containers / bags shall be provided with a general label. The storage area should	Being Complied. We have made storage area as per guidelines the picture of same is attached as **Annexure-2.**

	be at an isolated spot in the premises and must be fenced, covered and duly marked.	
4	The authorized person/agency shall ensure that no adverse impact on the air, soil and water including groundwater takes place due to activities for which authorization has been requested. Comprehensive safety measures must be followed in handling of wastes and the staff must be properly trained.	Being Complied.
5	It is brought to your notice that as per the order dated 14-11-2003 passed by the Hon'ble Supreme Court in W.P. (c) No. 657 of 1995, no industry covered under Hazardous and other Wastes (Management and Tran boundary Movement) Rules, 2016 shall be allowed to operate without valid authorization. It is also provided in the same orders that industries which are not complying with the conditions of authorization shall not be allowed to operate. Hence in case you fail to apply for authorization, before its expiry or fail to comply with conditions of the earlier authorization issued to you, closure order shall be issued against your industry without any further notice.	Noted for Compliance.
6	The applicant must file returns on prescribed Form- 4 along with a compliance report of this letter and should also maintain records on Form 3 and present it to Board's inspecting officials.	Form-4 is attached with this compliance report as **Annexure-1.**
7	In case of occurrence of an accident, complete details on form must be sent to U.P. Pollution Control Board at the earliest along with details of mitigative and remedial measures taken.	Noted for Compliance
8	The authorized person/agency shall not receive, collect, or store any hazardous waste from any unauthorized occupier or generator of hazardous wastes. In case any hazardous wastes is sold to any other reprocessing unit it must be ensured that such unit is fully complying with environmental requirements and has a valid authorization of the Board.	Noted for Compliance
9	In no case any hazardous wastes shall be disposed off on land, in any drain or stream. All spillages of hazardous chemicals, used containers, of hazardous chemicals such as flammable corrosive, explosive and toxic nature must be safely collected and stored. Non-compatible wastes must be suitably and safely handled.	Noted for Compliance.

10	It is within the powers and functions of the U.P. Pollution Control Board to modify / revoke the terms and conditions of the authorization/Registration issued under the Rule - 7 of Hazardous and Other Wastes (Management and Tran boundary Movement) Rules, 2016.	Noted.
11	You are directed to display on-line data/display board outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises. Necessary compliance should be sent within 15 days of receipt of this letter.	Display Board is installed at Main Gate of Factory, picture is attached as **Annexure-3**
12	It is the mandatory duty of the authorized person/agency to comply with the guidelines for transportation of hazardous waste in accordance with rule 18 of Hazardous and Other Waste (Management and Tran boundary Movement) Rules, 2016.	Being Complied.
13	It should be ensured that hazardous wastes shall be properly collected and packed in HDPE bags and then temporarily stored in a lined RCC tank/pit with suitable shed..	Being Complied. We have made storage area as per guidelines the picture of same is attached as **Annexure-2.**
14	An ETP sludge test report of a laboratory approved under E.P. Act shall be submitted along with compliance of this letter of this office.	ETP Sludge Test Report is attached as **Annexure-4.**
15	Used oil shall be sold only to recyclers registered with U.P. Pollution Control Board. The record shall be maintained.	Being Complied. All the used Oil is only sold to registered recyclers to UPPCB.
16	The occupier, transporter and operator of a facility shall be liable for damages caused to the environment resulting due to improper handling and disposal of hazardous waste listed in schedule 1, 2, and 3 and shall be liable to pay a fine as levied by the State Pollution Control Board under the rules.	Noted.
17	Details of raw material (which is Hazardous waste) and product along with quantity shall be sent within a month.	Coal is only Raw Material used for electricity generation.
18	You shall become the member of any common TSDF for S.L.F. which has been authorized by UPPCB and send the stored hazardous wastes for final disposal to the TSDF and report back to U.P.P.C.B. with the required manifesto (document of proof) within one/three month of this letter.	We are member of Bharat Oil & Waste TSDF facility Kanpur and all manifesto are regularly sent. Membership Certificate with Bharat Oil & Waste TSDF facility Kanpur is attached as **Annexure-5.**

19	The unit shall ensure that H.W. is regularly sent to Authorized common TSDF and shall not store for more than 90 days in accordance with under rule 8 of HOWM Rules, 2016.	Being Complied. All the waste is disposed well within 90 days' time.
20	Emission from the Common/Captive incinerator stack shall meet the prescribed standards under Environmental Protection Act. 1986.	Not Applicable.
21	Copies of Hazardous Waste Manifest in Form-10 shall be sent regularly to UPPCB for each category of waste sent to TSDF/Incinerator. revocation, with additional conditions mentioned in the closure revocation order.	Being Complied.
22	This authorization/Registration is valid till the industry is having valid consent as per the provisions of Air(Prevention and Control of Pollution) Act 1981 and Water (Prevention and Control of Pollution) Act, 1974.	Noted for Compliance.
23	Industry shall comply the provisions of EP Act, 1986, Water (Prevention and Control of Pollution) Act, 1974 as amended, Air (Prevention and Control of Pollution) Act, 1981 as amended and E-waste (Management and Handling) Rules, 2016.	Being Complied.
24	The industry shall ensure renewal of agreement from TSDF before expiry date.	Being Complied.
25	The authorized actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorization.	Not Applicable.

We once again assure you that, we are sincere to our environment and very much conscious to our social responsibilities for the protection of environment and committed towards creating a clean and safe environment in and around our manufacturing facility.

Thanking You

Yours Sincerely

For Bajaj Energy Ltd.

Unit: Khambharkhera

Authorized Signatory

CC. Regional Officer, Uttar Pradesh Pollution Control Board, Lucknow

Annexure-1

bajaj ENERGY

Ref: BEL /KKH/EHS/2022/27

Dated: 15.06.2022

To,

The Member Secretary
U.P. Pollution Control Board,
Picup Bhawan, 3rd Floor, B-Block
Vibhuti Khand, Gomti Nagar,
LUCKNOW – 226 010

Sub: **Annual return of hazardous waste generation of our Bajaj Energy Limited Unit-Khambharkhera.**

Dear Sir,

Please find here with form (Form-4) duly filled in triplicate annual return of hazardous waste generation for the period 2021-22. Against issuance of authorization for the disposal of hazardous waste reference number; **13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021 dt. 28.02.2021**. Along with above please also find herewith Annual return of E waste Form-3 & Form VIII for annual return of Bulk Consumer of Batteries.

Thanking you,

Your's Faithfully,

For Bajaj Energy Limited.

(Authorised Signatory)

Encl.: As above

C.C.; Regional Officer UP Pollution Control Board 4th Floor, B-Block Vibhuti Khand, Gomti Nagar Lucknow-226010.

Bajaj Energy Limited

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FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March]

1. Name and address of facility:	**Bajaj Energy Ltd,** Unit-Khambharkhera, District-Lakhimpur Khiri.
2. Authorisation No. and Date of issue:	**13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021, Dated- 28.02.2021**
3. Name of the authorised person and full address with telephone, fax number and e-mail:	**Dharmindar Singh,** Bajaj Energy Ltd, Unit-Khambharkhera, District-Lakhimpur Khiri. (U.P.) Pin: 261506. Tel: 05872220034 Fax: 05872220034
4. Production during the year (product wise), wherever applicable	

Part A. To be filled by hazardous waste generators

1. Total quantity of waste generated category wise	Sch.-1, Cat.-5.1 (Used or spent oil)- **4515 Litter** Sch-I, Cat-3.3 (Sludge and filters contaminated with oil)- **20KG** Sch-I, Cat-33.1 (Empty barrels/containers wastes) including oil soked Cotton waste- **10KG** Sch-I, Cat-35.2 (Spent ion exchange resin)- **150Kg** Sch-I, Cat-35.3 (ETP Sludge)- **20Kg**
2. Quantity dispatched (i) to disposal facility (ii) to recycler or co-processors or pre-processor (iii) others	Sch.-1, Cat.-5.1 (Used or spent oil)- **4515 Litter** Sch-I, Cat-3.3 (Sludge and filters contaminated with oil)- **20KG** Sch-I, Cat-33.1 (Empty barrels/containers wastes) including oil soked Cotton waste- **10KG** Sch-I, Cat-35.2 (Spent ion exchange resin)- **150Kg** Sch-I, Cat-35.3 (ETP Sludge)- **20Kg**
3. Quantity utilised in-house, if any –	**NA**
4. Quantity in storage at the end of the year	**NIL**

Part B. To be filled by Treatment, storage and disposal facility operators

1. Total quantity received -	**NA**
2. Quantity in stock at the beginning of the year –	**NA**
3. Quantity treated	**NA**
4. Quantity disposed in landfills as such and after treatment	**NA**
5. Quantity incinerated (if applicable) –	**NA**
6. Quantity processed other than specified above –	**NA**
7. Quantity in storage at the end of the year –	**NA**

Part C. To be filled by recyclers or co-processors or other users

1. Quantity of waste received during the year (i) domestic sources (ii) imported (if applicable)	**NA**
2. Quantity in stock at the beginning of the year –	**NA**
3. Quantity recycled or co-processed or used	**NA**
4. Quantity of products dispatched (wherever applicable)	**NA**
5. Quantity of waste generated –	**NA**
6. Quantity of waste disposed –	**NA**
7. Quantity re-exported (wherever applicable)-	**NA**
8. Quantity in storage at the end of the year –	**NA**

Date-15.06.2022
Place – Lakhimpur Kheri

Signature of the Occupier or Operator of the disposal facility

DUPLICATE FOR SUPPLIER

TAX INVOICE UNDER GST

(Under Section 31 of "The Central Goods & Services Tax Act' 2017')

bajaj ENERGY

Bajaj Energy Limited
Unit :- Shardanagar Road, Khamba Khera, Shrinagar,
Lakhimpur Kheri, Uttar Pradesh - 261506
GSTIN : 09AADCB4098C1ZH
PAN No : AADCB4098C

Invoice No / Date	: 3000501118 /14.08.2021
Ref Invoice / Date	:
Currency	: INR
Place of Supply	: Baghat
State of Supply / State Code	: Uttar Pradesh / 09
Whether Tax Payable under Reverse Charge	: No

Details of Receiver /recepient (Billed To)

Name : Indo Industries
Address : Abera, Baghat - 250609

State / U.T. : Uttar Pradesh - 09
GSTIN Unique ID : 09ABHPA9275F1ZJ
PAN No : ABHPA9275F

Details of Consignee (Shipped To)

Name : Indo Industries
Address : Abera, Baghat - 250609

State / U.T. : Uttar Pradesh - 09
GSTIN Unique ID : 09ABHPA9275F1ZJ
PAN No. : ABHPA9275F

S.No	Description of Goods Services	HSN / SAC Code	UOM	Quantity	Rate per unit	Exempted Value (Rs.)	Taxable Value (Rs.)	Total Value (Rs.)
1	OIL B GRADE USED OIL	271000	L	1515.000	28.00	0.00	42420.00	42420.00
Total				1515.000	Total Taxable Value			42420.00

Remarks (If Any)	CGST @ 9 %	3817.80
	SGST @ 9 %	3817.80
	Total GST	7635.60
	TCS @ 1 %	501.00
	Rounding Off	0.40

Total value (in words) Rs Fifty Thousand Five Hundred Fifty Seven Only — Total value (in figure) 50557.00

Ack No. / Ack Date	142110580649164 / 2021-08-14 17:11:00		
E-Way Bill No	471194595764		
Mode Of Transport	BY ROAD		
Transporter Name	NEW HIGHWAY TRANSPORT CO		
LR/GR No	705/14.08.2021	Vehicle No.	UP13AT-8818

Checked by:

for Bajaj Energy Limited

Authorised Signatory

Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and that there is no flow of any additional consideration involved directly or indirectly against this transaction.

Note

1. Interest will be charged at applicable rate if the payment is not made within the stipulated time
2. Goods must be carefully examined in respect of quality and weight before taking delivery
3. Our risk & responsibility ceases soon after handing over the goods to the carrier.
4. All disputes are subject to Gautam Buddha Nagar (U.P.) jurisdiction only

DUPLICATE FOR SUPPLIER

TAX INVOICE UNDER GST

(Under Section 31 of "The Central Goods & Services Tax Act' 2017")

Bajaj Energy Limited
Unit :- Shardanagar Road, Khambarkhera, Shrinagar,
Lakhimpur Kheri, Uttar Pradesh - 261506
GSTIN : 09AADCB4998C1ZH
PAN No. : AADCB4998C

Invoice No./ Date : 3005501119 /14.08.2021
Ref Invoice / Date :
Currency : INR
Place of Supply : Bagphat
State of Supply / State Code : Uttar Pradesh / 09
Whether Tax Payable under Reverse Charge : No

Details of Receiver /recepient (Billed To)

Name :Indo Industries
Address :Ahera, Bagphat - 250609

State / U.T. :Uttar Pradesh - 09
GSTIN Unique ID :09ABHPA9275F1ZJ
PAN No :ABHPA9275F

Details of Consignee (Shipped To)

Name :Indo Industries
Address :Ahera, Bagphat - 250609

State / U.T. :Uttar Pradesh - 09
GSTIN Unique ID :09ABHPA9275F1ZJ
PAN No. :ABHPA9275F

S.No	Description of Goods Serivces	HSN / SAC Code	UOM	Quantity	Rate per unit	Exempted Value (Rs.)	Taxable Value (Rs.)	Total Value (Rs.)
1	OIL B GRADE USED OIL	271000	L	3000.000	28.00	0.00	84000.00	84000.00
Total				3000.000	Total Taxable Value			84000.00

Remarks (If Any)	CGST @ 9 %	7560.00
	SGST @ 9 %	7560.00
	Total GST	15120.00
	TCS @ 1 %	991.00

Total value (in words):Rs.One Lakhs One Hundred Eleven Only — Total value (in figure) 100111.00

Ack No. / Ack Date	142110580649173 / 2021-08-14 17.11.00
E-Way Bill No.	481194598034
Mode Of Transport	BY ROAD
Transporter Name	NEW HIGHWAY TRANSPORT CO
LR/GR No.	705/14.08.2021 — Vehicle No. UP13AT-8818

Checked by:

for Bajaj Energy Limited
Authorised Signatory

* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and that there is no flow of any additional consideration involved directly or indirectly against this transaction

Note

1. Interest will be charged at applicable rate,if the payment is not made within the stipulated time.
2. Goods must be carefully examined in respect of quality and weight before taking delivery.
3. Our risk & responsibility ceases soon after handling over the goods to the carrier.
4. All disputes are subject to Gautam Buddha Nagar (U.P.) jurisdiction only

FORM - 10

[See Rule 19 (1)]

MANIFEST FOR HAZARDOUS AND OTHER WASTE

1.	Sender's Name & Mailing Address (including Phone No. and E-mail) :	Bajaj Energy Ltd. Sarda Nagar Road, Village- Khamharia Khera, Lakhimpur Kheri 262501 (U.P)
2.	Sender's Authorisation No. :	13700/UPPCB/Lucknow/HWN/Lakhimpur Kheri/2021
3.	Manifest Document No. :	3005501118/3005501119
4.	Transporter's Name & Address (Including Phone No. & E-mail) :	New Highway Transport Company Highway Road, Lakhimpur Kheri U.P (262701) 8299932696, tallentsian823@gmail.com
5.	Type of Vehicle :	(Truck / Tanker / Special Vehicle)
6.	Transporter's Registration No. :	09BJRPK7705H1ZA
7.	Vehicle Registration No. :	UP13 AT 8818
8.	Receiver's Name and Mailing Address (Including Phone No. and & E-mail) :	M/S Indo Industries Vill-Ahirya, Chamrawal Road Bagapat (U.P)
9.	Receiver's Authorisation No. :	H06946/C-3/Extn-164/HO/2017
10.	Waste Description :	Used Oil / Waste Oil
11.	Total Quantity / No. of Containers :	15.15+3000 .....m³ or MT ..... 21 ..... Nos.
12.	Physical Form :	(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13.	Special Handling Instructions and Additional Information :	Do not throw from truck. In case of leakage/ spillage use washing soap at point of leakage to stop slip hazard
14.	SENDER'S CERTIFICATE : I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised, packed, marked and labeled and are in all respects in proper conditions for transport by road according to applicable national government regulations.	
	Name & Stamp : Signature :	Month: 14 / Day: 08 / Year: 2021
15.	Transporter Acknowledgment of Receipt of Wastes :	
	Name & Stamp : Signature :	Month: 14 / Day: 08 / Year: 2021
16.	Receiver's Certification for Receipt of Hazardous and Other Waste :	
	Name & Stamp : For INDO INDUSTRIES Signature :	Month / Day / Year

Authorized Signatory

TAX INVOICE

Printed on 30-Dec-2021 05:09
(1st ORIGINAL FOR BUYER)

Bharat Oil & Waste Management Ltd. Gata No 672 Vill Kumbhi, Akbarpur Road, NH - 2 Kanpur Dehat,UTTAR PRADESH - 209101 STATE CODE :09 GSTIN/UIN :09AADCB1158N2ZF PAN :AADCB1158N CIN :U11201DL2007PLC160944 E-Mail :sales@bharatoil.com	Invoice No K/SER/4670/21-22	Dated 30-Dec-2021
	Customer ID : 5668	Mode/Term of Payment
	Supplier's Ref :- 000030052122200083	Supplier's Ref Dated :- 28-Dec-2021
Buyer/ Recipient **Bajaj Energy Limited** **Unit :- Khamberkhera, Shardanagar Road, Lakhimpur,Kheri** **UTTAR PRADESH 261506, India** **GSTIN/UIN :09AADCB4998C1ZH** **PAN :AADCB4998C** **PLACE OF SUPPLY: UTTAR PRADESH - State Code: 09**	P.O. NO 0	P.O. DATE
	WTS Reference No 48727	WTS Dated 28-Dec-2021
	SEAL No :-	Vehicle No : UP31T-6562

Billing Address **Bajaj Energy Limited** **Unit :- Khamberkhera, Shardanagar Road, Lakhimpur,Kheri** **UTTAR PRADESH 261506, India** **STATE CODE :09** **GSTIN/UIN :09AADCB4998C1ZH** **PAN :AADCB4998C**	Form - 10: 54664	Eway bill : NA
	LR NO.	LR Dated :
	Reverse Charge Applicable : NO	Box/Cases :

SL No	Category	Description Of Goods	HSN/SAC	Quantity	Rate (₹)	Unit	Amount (₹)
		Hazardous Waste Disposal Services					
1	35.3	**Chemical sludge from waste water treatment/ETP/CETP Sludge**	999432	20	5.00	KG	100.00
2	33.1	**Empty barrels/containers/liners contaminated with hazardous chemicals / wastes**	999432	10	7.00	KG	70.00
3	35.2	**Spent ion exchange resin containing toxic metals / WTP Sludge**	999432	150	25.00	KG	3,750.00
4	3.3	**Sludge and Filters contaminated with oil**	999432	20	17.00	KG	340.00
		Escrow Fund	999432		5%		5.00
		Total Taxable Value					4,265.00
		SGST			9%		383.85
		CGST			9%		383.85
		Round Off					0.30
		Grand Total		200.0		KG	₹ 5,033.00

Amount Chargeable (in words) : INR Five Thousand Thirty Three Rupees Only

E. & O.E

HSN/SAC	Taxable Value	Central Tax		State Tax		Total Tax Amount
		Rate (₹)	Amount (₹)	Rate (₹)	Amount (₹)	
999432	4,265.00	9.00	383.85	9.00	383.85	767.70
Total	4,265.00		383.85		383.85	767.70

Tax Amount (in words): INR Seven Hundred And Sixty Eight Rupees Only

- Declaration:
- 1. We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.
- 2. Interest @ 24% per annum payable if the bills is not cleared/paid within 07 days of presentation of the documents.
- 3. Please pay only by RTGS/NEFT/DD/Cheque; IF DD/Cheque then Please mail to BOWML,Attn: Accounts, 11 LGF, Community Center, East Of Kailash, New Delhi 110065. Tel: 011-41000710/26216466/9717706048 sales@bharatoil.com
- 4. Bill/ Invoice is final, if no dispute notified in writing with in 7 days of Invoice.

- Company's Bank Details:
- Bank Name : Axis Bank Limited
- A/C NO. : 909020031262864
- Branch Add : Lajpat Nagar,New Delhi
- IFS Code : UTIB0000126
- for Bharat Oil & Waste Management Ltd.
-

Sonia Gandhi
Senior Accountant
sales@bharatoil.com

Digitally Signed By: Sonia Gandhi
Date: 2022-01-03 12:33:01
IP: 122.160.48.54
ID: SMZD2/hQUnP2QH/hyPyoSag==
Click here to Revoke

4670/21-22 BOWML

FORM 10 Copy for Operator of Facility

[See rule 19 (1)]

MANIFEST FOR HAZARDOUS AND OTHER WASTE S.No.: 54604

1 Occupier's Name & Mailing Address (including Phone No. and email)	BAJAJ ENERGY Ltd, Shanda Nagar Road, Vill - Khamlahai, Kalan Lakhimpur Kheri, U.P. - 261506
2 Sender's Authorization No.	3720/UPPCB/Lucknow/HWM/Lakhimpur Kheri/2021
3 Manifest Document No.	30057122200083
4 Transporter's Name & Address (including Phone No. and email)	Vijendra Singh 8115866100
5 Type of Vehicle	(Truck / Tanker / Special Vehicle)
6 Transporter's Registration	
7 Vehicle Registration No.	UP 31 - T - 6562
8 Receiver's Name & Mailing Address (including Phone No. and email) CIN-U11201DL2007PLC160944	(i) BHARAT OIL COMPANY (E-18, Site-IV, Sahibabad Indus Ghaziabad, UP-201010 Tel.: 01 e-mail:sales@bharatoil.com
(ii) BHARAT OIL & WASTE MANAGEMENT LTD. Mauza Mukimpur, Roorkee-Lakshar Road, Roorkee - 247664 UK, Tel. :08874207664 e-mail:sales@bharatoil.com	(iii) BHARAT OIL & WASTE MANAGEMENT LTD. Plot # 672, Sikandra Road, NH-2, Kumbhi Village, Tehsil Akbarpur, Kanpur Dehat, UP, Tel : 0512-2295298 e-mail:sales@bharatoll.com
9 Receiver's Authorization No.	(i) 1486/UPPCB/Ghaziabad(UPPCERO)/HWM/GHAZIABAD/2018 Valid upto: 03/05/2023
(ii) UEPPCB/HO/Con-B-84/2018/548 Valid upto: 31/03/2023	(iii) 1403/UPPCB/Kanpur Dehat(UPPCERO)/HWM/KANPUR DEHAT/2018 Valid upto: 30/04/2021
10 Waste Description	Used Resin, ETP Sludge, Empty Barrel, Oil Soaked Used Filter
11 Total Quantity No. of Containers	Used Resin - 150 kg, ETP Sludge - 20 kg or MT Empty Barrel 10 kg Nos. Total - 0.20 MT Oil Soaked Filter 25 kg 05 Bags
12 Physical Form	(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13 Special Handling Instructions & Additional Information	Do not throw Drums from truck. In case of leakage/ seapage, use Washing soap at point of leak to stop its leakage.
14 SENDER'S CERTIFICATE Typed Name & Stamp : Signature :	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised packed, marked, and labeled, and are in all respects in proper condition for transport by road Month 12 Day 12 Year 2021
15 Transporter Acknowledgement of Receipt of Waste Typed Name & Stamp : Signature :	Month 12 Day 12 Year 2021
16 Receiver's Certificate for Receipt of Hazardous and other Waste Typed Name & Stamp : Signature :	Month 12 Day 12 Year 2021

Annexure – 2


HAZARDOUS WASTE STORAGE AREA
USED FILTER & USED CLOTH
ETP SLUDGE
USED RESIN
USED OIL & WASTE OIL
USED BATTERY
USED CLOTH
USED OIL


HAZARDOUS WASTE STORAGE AREA
USED FILTER & USED CLOTH
ETP SLUDGE
USED RESIN
USED OIL & WASTE OIL
USED BATTERY
USED CLOTH
USED OIL

Annexure – 3



Annexure – 4

ASIA ENVIRO LAB
(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)
Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.
Lab - H1-037, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Alwar (Rajasthan)-301019
Ph. No. : 01493-294022, 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/30082022/S/01	Reporting Date : 05.09.2022

Issued to:	Sample I'd : AEL/BEL/300822/S/01
M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, LAKHIMPUR , (U.P) INDIA	**Date** : 30.08.2022 **Period of Testing**: 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Sample Description	Sludge Sample
Sampling Location	Sludge Sample from ETP Plant
Date of Sampling	27.08.2022
Purpose of Analysis	Monitoring

Remark: - ND-Not Detectable

TEST RESULTS

A. TEST ON 10% WATER LEACHATES

S. No.	TESTS	RESULTS	PROTOCOL
01.	pH	7.39	IS : 2720 (P-26, 1987)
02.	Copper (as Cu) (mg/l)	BDL	USDA Method
03.	Cadmium (as Cd) (mg/l)	BDL	USDA Method
04.	Chromium (as Cr) (mg/l)	BDL	USDA Method
05.	Zinc (as Zn) (mg/l)	BDL	USDA Method
06.	Nickel (as Ni)(mg/l)	BDL	USDA Method
07.	Lead (as Pb)(mg/l)	BDL	USDA Method
08.	Oil & Grease (mg/l)	1.64	USDA Method
09.	Cyanide (as CN) (mg/l)	BDL	USDA Method
10.	Bio-assay test, (% Survival of fish after 96 hours)	100	IS: 6582-1971

BDL: - Below Detection Limit
Detection limit: - 1.0 mg/l

B. CHARACTERIZATION STUDY

Reactivity:-

The sample was tested with respect to its reactivity with water. It does not evolve fumes, explosive gases, etc., on addition of water. Hence, the sample does not indicate reactive nature.

Ignitability:

On ignition, the sample does not catch fire and hence the sample is not self-combustible.

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
3. Any complaints about this report should be communicated within 7 days of issue of this report.
4. The report is Not to be reproduced wholly or in part and can Not be used as an evidence in the Court of law and should Not be used in any advertising Media without our special permission in writing.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Job Description : Environmental Testing, ETP/STP Manufacturing, ETP/STP Plant Operation Pollution NOC Etc.

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Alwar (Rajasthan)-301019

Ph. No. : 01493-294022, 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/30082022/S/02	Reporting Date : 05.09.2022

Corrosively:-

The pH of water leachate of the sample is found 7.41. The acceptable range is 2.0 to 12.5.

Toxicity:-

The toxicity characteristic of the sample was studied by conducting bio-assay test on the water leachate of the sample. Test observation revealed that none of the fish died during the tests. Hence, water leachate of the sample is free from acute toxicity.

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test verification.
3. Any complaints about this report should be communicated within 7 days of issue of this report
4. The report is Not to be reproduced wholly or in part and can Not be used as an evidence in the Court of law and should Not be used in any advertising Media without our special permission in written.

Annexure – 5



MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

BOWML/K/3785/20

Gata No. 672,706Cha Vill. Kumbhi,Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

BOWML/K/3785/20

One may verify 'active' membership by calling

Bharat Oil & Waste Management Ltd. at

011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

For **Bharat Oil & Waste Management Ltd.**

Pragati Rohtagi
Sales Cordinator
sales@bharatoil.com

Digitally Signed By:Pragati Rohtagi
Date: 2022-12-22 08:52:54
IP: 49.36.182.174
ID: 6nVwkdEibIKFTRdIJUR/A==
Click here to E-verify

Authorized Signatory

For **Bharat Oil & Waste Management Ltd.**

Sunder K Kukreja
GM (Admin & Fin.)
sales@bharatoil.com

Digitally Signed By:Sunder K Kukreja
Date: 2022-12-22 09:00:38
IP: 49.36.182.174
ID: UGxfPmPJQGeYUuWIwTxqgQ==
Click here to E-verify

Authorized Signatory

Packers of 21ST CENTURY LUBRICANTS & GREASES

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065, India
Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41000710, 26210205 Telefax : 26216466
Email : sales@bharatoil.com www.bharatoil.com

Facilities :
- E - 18, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Mukimpur Roorkee-Lakshar Road Roorkee - 247664 (UK)
- SIDCUL - Haridwar (UK)

ANNEXURE-R-4

(Colly)

bajaj ENERGY

To,
The Member Secretary,
UP Pollution Control Board,
TC-12V, Vibhuti Khand, Gomti Nagar,
Lucknow - 226010

Subject: Under Protest Payment of Environmental Compensation of 3.5 Lakhs for BEL Khambhar Khera Unit.

Reference:
1. Hon'ble NGT's Case Reference no. OA No. 691/2022
2. Visit of Hon'ble NGT Committee to Khambhar Khera Unit on 21-22.12.2022.
3. Order of Hon'ble NGT on 20.01.2023 non-compliances noticed by the committee during their visit,
4. Khambhar Khera Unit Letter vide no. BEL/KKH/NGT/02-2023 dated 20.01.2023 submitting HW Compliance report.
5. Show Cause Notice from CEO, C-5, UPPCB, Lucknow vide No. 42/CEO/Camp/C-5/Jal-132/23 dated 25.01.2023 on non-compliance related to the Hazardous Waste Shed.
6. Khambhar Khera Unit Reply to the Show Cause Notice vide no. BEL/Show Cause/2023 dated 07.02.2023.
7. Letter from CEO, C-5, UPPCB Lucknow vide No. H88879/C-5/Sahamati Jal/132/2023 dated 10.02.2023 imposing Environmental Compensation of 3.5 Lakhs on Khambhar Khera Unit.

Respected Sir,

This has reference to Hon'ble NGT's Case Reference no. OA No. 691/2022 of Rama Shanker Awasthi (Applicant) V/s State of UP & Ors. (Respondent(s).

We are in receipt of a letter vide No. H88879/C-5/Sahamati Jal/132/2023 dated 10.02.2023, advising to submit an Environmental Compensation of Rs. 3.5 Lakh for 2x45MW Khambhar Khera, Lakhimpur Kheri Power Plant as the unit had to develop a dedicated storage shed for the storage of contaminated drums and bags as per the Hazardous Waste (Management and transboundary Movement), Rules 2016. Here we would like bring to your kind notice that:

1. BEL Khambhar Khera Unit is in strict compliance with the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended and the Management of Hazardous Waste is being done as per the applicable guidelines only. The Unit has a well maintained Hazardous Waste storage shed/ separation dykes/garland drain and spill collection pit since beginning, to prevent any seepage/leakage outside Hazardous Waste Storage Area. The Unit is also having a valid TSDF membership of M/s Bharat Oil and Waste Management Limited, Kanpur. All the related compliance reports are submitted to the Board well in time.

Received
04/03/2023

डाक प्राप्ति रसीद
प्राप्ति दिनांक..03/03/23...
प्राप्तकर्ता के हस्ताक्षर.....AC.....
उ०प्र० प्रदूषण नियंत्रण बोर्ड, लखनऊ

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office : Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel: +91 5872 220006 Fax: +91 5872 220034
CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

bajaj GROUP
THINK TOMORROW

bajaj ENERGY

2. In addition, this Hazardous Waste Storage facility has always been inspected by the UPPCB officials, especially while granting / renewing Hazardous Waste Authorization for the plant.
3. During the inspection by the Hon'ble NGT committee, the Hazardous Waste Storage Facility at site had been shown to the team and it is registered too, but to our dismay, the committee had mentioned that there is no Hazardous Waste Storage Facility at site and noted it as a non-compliance in their report.
4. Based on the committee recommendations, Hon'ble NGT vide its order dated 20.01.2023, asked UPPCB the reason for not taking action against the proponent either for Environmental Compensation (EC) or by initiating criminal proceedings.
5. On the date of the order itself, i.e. on 20.01.2023, Khambhar Khera Unit had submitted Hazardous Waste shed related compliance document, including membership certificate and shed photographs, to the office of Chief Environmental Engineer (Circle 5), Lucknow.
6. But again on 25.01.2023, s Show Cause Notice was issued (received on 30.01.2023) by UPPCB stating that there is no reply received on earlier notice dated 04.01.2023 and hence why not an EC of Rs. 1.0 Lakh + additional EC @ Rs. 5000/- per day till remedial action is taken by Khambhar Khera Unit to be imposed. The Fact is that the Unit had never received any notice dated 04.01.2023 referred above.
7. Khambhar Khera Unit had submitted detailed reply to this Show Cause Notice dated 25-01-2023, along with compliance documents, on 07.02.2023 and requested to revoke the EC and penalty as proposed by UPPCB.
8. Further, UPPCB vide letter dated 10.02.23 stated that the reply to the Show Cause Notice was not filed by Khambhar Khera Unit and hence an EC of Rs. 3.50 Lakh is imposed and to be deposited in UPPCB account.
9. The Hon'ble NGT has deposed the case on 13.02.2023 with considering the penalty imposed on KKH unit by UPPCB.
10. Therefore, in-spite of complying with the clauses of Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended and submitting timely responses / information, as required by the UPPCB, an Environmental Compensation of Rs. 3.5 Lakh has been imposed on Khambhar Khera Unit, which seems not justified.
11. However, **honouring the judgement of Hon'ble NGT in the matter, we have now deposited, under protest, an amount of Rs. 3.5 Lakh (Rs. Three Lakh Fifty Thousand only)** as an Environmental Compensation imposed erroneously on our Khambhar Khera Unit vide UTR no. SBIN223055027329 on 27.02.2023 in UPPCB account of Union Bank of India, Vibhuti Khand, Gomti Nagar, Lucknow A/c No 701502010002104 (IFSC Code – UBIN0570150).

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office : Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 262 906, Uttar Pradesh
Tel:+91 5872 220006 Fax: +91 5872 220034
CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

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The receipt of the same may kindly be acknowledged,

Thanking you,

For Bajaj Energy Ltd.
Unit: Khambhar Khera, Lakhimpur Kheri (UP)

(Authorized Signatory)

Encl.: As above
Copy to:

1. District Magistrate Lakhimpur Kheri
2. Chief Environmental Officer Circle-5 UP Pollution Control Board Lucknow
3. Regional Officer Lucknow – UP Pollution Control Board Lucknow

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Ref: BEL/Show Cause/2023

Date: 07.02.2023

To,
The Chief Environmental Officer (Circle 5),
Uttar Pradesh Pollution Control Board,
TC-12V Vibhuti Khand, Gomti Nagar,
Lucknow- 226010

Subject: Regarding show cause notice dated 25.01.2023 issued to Bajaj Energy Ltd., Khambharkhera, Lakhimpur Kheri U.P. Unit.

Ref: UPPCB *letter No.42/CEO CAMP/C-5/JAI-132/23 Dated: 25.01.2023.*

Dear Sir,
This has reference to above mentioned show cause notice received by us on 30.01.2023. In this regard we would like to submit that, we are in strict compliance with all the conditions mentioned in the Hazardous Waste Authorization issued by the Board vide no. 13700/UPPCB/Lucknow(UPPCBRO)/HWM/Lakhimpurkheri/2021 date 28.02.2021 valid till 02.03.2026. The compliance reports of the same is enclosed as **annexure-1**.
In Furtherance to above, our submissions are as under-

Reply to the Letter no. 2151/consent-588 C/2023 dated 04.01.2023: In this regards we humbly appraise you that the said letter has not been received at our unit till date, though we have already submitted the compliance status of all the directions issued by the Hon'ble NGT on 20.01.2022 through email. The screenshot of the same is enclosed as **annexure-2.**

We are a reputed corporate organization and very much sincere to comply with the directions/orders issued by the authorities. We are submitting the replies of all the received letters/direction/notices well within the stipulated time limits.

Regarding Environmental Compensation: In this matter, it is pertinent to mention that strict compliance with the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended is ensured. The storage and Handling of Hazardous Waste is being done as per the Schedule-8, 16, 17, 18 & 19 of Hazardous and other Wastes Management Rule., 2016. We have a well maintained hazardous waste storage shed/ separation dykes/garland drain and spill collector pit, since our power plant operation, to prevent any seepage/leakage outside Hazardous Waste Storage Area. The Photographs of the same are enclosed as **annexure-3. The** Hazardous Waste Storage facility has always been inspected by the UPPCB officials, especially while granting / renewing Hazardous Waste Authorization for the plant.

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office: Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel:+91 5872 220006, Fax: +91 5872 270034
CIN: U40102UP2008PLC046764 | Web: www.bajajenergy.com

डाक प्राप्ति रसीद
प्राप्ति दिनांक 9/2/2023
प्राप्तकर्ता के हस्ताक्षर
उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, लखनऊ

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Additionally, the disposal of the waste is being done through authorized TSDF facility, the copy of the TSDF certificate is enclosed as **annexure-4.**

During the inspection by the Hon'ble NGT committee, this hazardous waste storage facility at site has been shown to the team and it is registered also but in the report somehow it is missed, it seems.

Based on above evidences, we would like to state that the unit has not violated any guidelines of Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016, and there is no any adverse/unsafe environmental conditions like leakage/seepage, soil/land contamination, Surface water, ground water contamination found, so there is no chance of any adverse environmental impact and also any health hazard to nearby inhabitants, flora & fauna. The ground water and soil analysis reports are enclosed as **annexure-5.**

In the light of above fact, we would like to request your good-self to kindly revoke the said Show Cause notice, as we are in strict compliance with the guidelines of Hazardous waste management and having a proper storage and disposal facilities since the power plant operation.

We once again assure you that, we are sincere to conserve our environment and conscious of our social responsibilities and are committed towards creating a clear and safe environment in and around our manufacturing unit and will always remain so.

Thanking you,

Yours Faithfully,
For Bajaj Energy Ltd.,
Unit – Khmabharkhera

(Authorized Signatory)
Encl: As Above
CC To:

- The District Magistrate, Lakhimpur
- The Regional officer, UPPCB, Lucknow

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office: Khambarkhera, Shardanagar Road,
Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel: +91 5872 220006 Fax: +91 5872 220034
CIN: U40102UP2008PLC046764 | Web: www.bajajenergy.com

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Ref: BEL/Show Cause/2023 **Date:** 07.02.2023

To,
The Chief Environmental Officer (Circle 5),
Uttar Pradesh Pollution Control Board,
TC-12V Vibhuti Khand, Gomti Nagar,
Lucknow- 226010

Subject: Regarding show cause notice dated 25.01.2023 issued to Bajaj Energy Ltd., Khambharkhera, Lakhimpur Kheri U.P. Unit.

Ref: UPPCB *letter No.42/CEO CAMP/C-5/JAI-132/23 Dated: 25.01.2023.*

Dear Sir,
This has reference to above mentioned show cause notice received by us on 30.01.2023. In this regard we would like to submit that, we are in strict compliance with all the conditions mentioned in the Hazardous Waste Authorization issued by the Board vide no. 13700/UPPCB/Lucknow(UPPCBRO)/HWM/Lakhimpurkheri/2021 date 28.02.2021 valid till 02.03.2026. The compliance reports of the same is enclosed as **annexure-1.**
In Furtherance to above, our submissions are as under-

Reply to the Letter no. 2151/consent-588 C/2023 dated 04.01.2023: In this regards we humbly appraise you that the said letter has not been received at our unit till date, though we have already submitted the compliance status of all the directions issued by the Hon'ble NGT on 20.01.2022 through email. The screenshot of the same is enclosed as **annexure-2.**

We are a reputed corporate organization and very much sincere to comply with the directions/orders issued by the authorities. We are submitting the replies of all the received letters/direction/notices well within the stipulated time limits.

Regarding Environmental Compensation: In this matter, it is pertinent to mention that strict compliance with the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 as amended is ensured. The storage and Handling of Hazardous Waste is being done as per the Schedule-8, 16, 17, 18 & 19 of Hazardous and other Wastes Management Rule., 2016. We have a well maintained hazardous waste storage shed/ separation dykes/garland drain and spill collection pit, since our power plant operation, to prevent any seepage/leakage outside Hazardous Waste Storage Area. The Photographs of the same are enclosed as **annexure-3. The** Hazardous Waste Storage facility has always been inspected by the UPPCB officials, especially while granting / renewing Hazardous Waste Authorization for the plant.

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We once again assure you that, we are sincere to conserve our environment and conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing unit and will always remain so.

Thanking you,

Yours Faithfully,
For Bajaj Energy Ltd.,
Unit – Khmabharkhera

(Authorized Signatory)
Encl: As Above
CC To:

- The District Magistrate, Lakhimpur
- The Regional officer, UPPCB, Lucknow

17/02/202

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Unit & Registered Office : Khambarkhera, Shardanagar Road,
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Ref: BEL/KKH/HWM/EHS/23/73

February 07, 2023

To,
The Chief Environment Officer, Circle-5
Uttar Pradesh Pollution Control Board
Tc-12V, Vibhuti Khand, Gomti Nagar,
Lucknow-226010

Sub: Compliance Report of Authorization issued under the provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 reference No. **13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021** dated 28/01/2021 for M/s Bajaj Energy Ltd, Khambhar khera, Lakhimpur Kheri (UP).

Dear Sir,
The pointwise compliance report is as under-

Sl.	Conditions	Compliance Status
1	The authorised person shall comply with the provisions of the Environment (Protection Act, 1986, and the rules made there under.	Being Complied.
2	The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the State Pollution Board.	Noted for Compliance.
3	The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.	Noted for Compliance.
4	Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorisation.	Noted for Compliance.
5	The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.	Emergency Response Procedure (ERP) is in place. Regular Mock drills are carried out.
6	The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and penalty.	Being Complied.

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CIN: U40102UP2006PLC046704 | Web: www.bajajenergy.com

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7	It is the duty of the authorised person to take prior permission of the State Pollution Control Board to close down the facility.	Noted for Compliance
8	The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.	Not Applicable
9	The record of consumption and fate of the imported hazardous and other wastes shall be maintained.	Not Applicable
10	The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilisation of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorisation.	Not Applicable
11	The importer or exporter shall bear the cost of Import or export and mitigation of damages if any	Not Applicable
12	An application for the renewal of an authorisation shall be made as laid down under these Rules.	Note for Compliance.
13	Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Changes or Central Pollution Control Board from time to time.	Note for Compliance.
14	Annual return shall be filed by June 30th for the period ensuring 31st March of the year.	Annual Return is always filed well within time. Annual Return for FY 2021-22 (Form-4) is attached as **Annexure-1**
15	The Unit will file the renewal application at least 2 months prior to the expiry of this Order.	Noted for Compliance.
Specific Conditions		
Sl.	**Conditions**	**Compliance Status**
1	Board has issued earlier HWM Authorization vide letter no-4477/UPPCB/Lucknow(UPPCBRO)/ HWM/LAKHIMPUR KHERI/2018 Dated 28.09.2018is herby revoked.	Noted.
2	The authorization shall be valid for a period of Five Years from the date of issue, if not suspended or cancelled earlier.	Noted.
3	The wastes must be safely collected in leak proof containers and shall be duly marked in a manner suitable for handling, storage and transport and the packaging shall be easily visible and be able to withstand physical conditions and climatic factors. All hazardous waste containers / bags shall be provided with a general label. The storage area should	Being Complied. We have made storage area as per guidelines the picture of same is attached as **Annexure-2.**

	be at an isolated spot in the premises and must be fenced, covered and duly marked.	
4	The authorized person/agency shall ensure that no adverse impact on the air, soil and water including groundwater takes place due to activities for which authorization has been requested. Comprehensive safety measures must be followed in handling of wastes and the staff must be properly trained.	Being Complied.
5	It is brought to your notice that as per the order dated 14-11-2003 passed by the Hon'ble Supreme Court in W.P. (c) No. 657 of 1995, no industry covered under Hazardous and other Wastes (Management and Tran boundary Movement) Rules, 2016 shall be allowed to operate without valid authorization. It is also provided in the same orders that industries which are not complying with the conditions of authorization shall not be allowed to operate. Hence in case you fail to apply for authorization, before its expiry or fail to comply with conditions of the earlier authorization issued to you, closure order shall be issued against your industry without any further notice.	Noted for Compliance.
6	The applicant must file returns on prescribed Form- 4 along with a compliance report of this letter and should also maintain records on Form 3 and present it to Board's inspecting officials.	Form-4 is attached with this compliance report as **Annexure-1.**
7	In case of occurrence of an accident, complete details on form must be sent to U.P. Pollution Control Board at the earliest along with details of mitigative and remedial measures taken.	Noted for Compliance
8	The authorized person/agency shall not receive, collect, or store any hazardous waste from any unauthorized occupier or generator of hazardous wastes. In case any hazardous wastes is sold to any other reprocessing unit it must be ensured that such unit is fully complying with environmental requirements and has a valid authorization of the Board.	Noted for Compliance
9	In no case any hazardous wastes shall be disposed off on land, in any drain or stream. All spillages of hazardous chemicals, used containers, of hazardous chemicals such as flammable corrosive, explosive and toxic nature must be safely collected and stored. Non-compatible wastes must be suitably and safely handled.	Noted for Compliance.

10	It is within the powers and functions of the U.P. Pollution Control Board to modify / revoke the terms and conditions of the authorization/Registration issued under the Rule – 7 of Hazardous and Other Wastes (Management and Tran boundary Movement) Rules, 2016.	Noted.
11	You are directed to display on-line data/display board outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant, including waste water and air emission and solid hazardous waste generated within the factory premises. Necessary compliance should be sent within 15 days of receipt of this letter.	Display Board is installed at Main Gate of Factory, picture is attached as **Annexure-3**
12	It is the mandatory duty of the authorized person/agency to comply with the guidelines for transportation of hazardous waste in accordance with rule 18 of Hazardous and Other Waste (Management and Tran boundary Movement) Rules, 2016.	Being Complied.
13	It should be ensured that hazardous wastes shall be properly collected and packed in HDPE bags and then temporarily stored in a lined RCC tank/pit with suitable shed,.	Being Complied. We have made storage area as per guidelines the picture of same is attached as **Annexure-2.**
14	An ETP sludge test report of a laboratory approved under E.P. Act shall be submitted along with compliance of this letter of this office.	ETP Sludge Test Report is attached as **Annexure-4.**
15	Used oil shall be sold only to recyclers registered with U.P. Pollution Control Board. The record shall be maintained.	Being Complied. All the used Oil is only sold to registered recyclers to UPPCB.
16	The occupier, transporter and operator of a facility shall be liable for damages caused to the environment resulting due to improper handling and disposal of hazardous waste listed in schedule 1, 2, and 3 and shall be liable to pay a fine as levied by the State Pollution Control Board under the rules.	Noted.
17	Details of raw material (which is Hazardous waste) and product along with quantity shall be sent within a month.	Coal is only Raw Material used for electricity generation.
18	You shall become the member of any common TSDF for S.L.F. which has been authorized by UPPCB and send the stored hazardous wastes for final disposal to the TSDF and report back to U.P.P.C.B. with the required manifesto (document of proof) within one/three month of this letter.	We are member of Bharat Oil & Waste TSDF facility Kanpur and all manifesto are regularly sent. Membership Certificate with Bharat Oil & Waste TSDF facility Kanpur is attached as **Annexure-5.**

19	The unit shall ensure that H.W. is regularly sent to Authorized common TSDF and shall not store for more than 90 days in accordance with under rule 8 of HOWM Rules, 2016.	Being Complied. All the waste is disposed well within 90 days' time.
20	Emission from the Common/Captive incinerator stack shall meet the prescribed standards under Environmental Protection Act. 1986.	Not Applicable.
21	Copies of Hazardous Waste Manifest in Form-10 shall be sent regularly to UPPCB for each category of waste sent to TSDF/Incinerator. revocation, with additional conditions mentioned in the closure revocation order.	Being Complied.
22	This authorization/Registration is valid till the industry is having valid consent as per the provisions of Air(Prevention and Control of Pollution) Act 1981 and Water (Prevention and Control of Pollution) Act, 1974.	Noted for Compliance.
23	Industry shall comply the provisions of EP Act, 1986, Water (Prevention and Control of Pollution) Act, 1974 as amended, Air (Prevention and Control of Pollution) Act, 1981 as amended and E-waste (Management and Handling) Rules, 2016.	Being Complied.
24	The industry shall ensure renewal of agreement from TSDF before expiry date.	Being Complied.
25	The authorized actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorization.	Not Applicable.

We once again assure you that, we are sincere to our environment and very much conscious to our social responsibilities for the protection of environment and committed towards creating a clean and safe environment in and around our manufacturing facility.

Thanking You

Yours Sincerely

For Bajaj Energy Ltd.

Unit: Khambharkhera

Authorized Signatory

CC. Regional Officer, Uttar Pradesh Pollution Control Board, Lucknow

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Annexure-1

Ref: BEL /KKH/EHS/2022/27

Dated: 15.06.2022

To,

The Member Secretary
U.P. Pollution Control Board,
Picup Bhawan, 3rd Floor, B-Block
Vibhuti Khand, Gomti Nagar,
LUCKNOW – 226 010

Sub: **Annual return of hazardous waste generation of our Bajaj Energy Limited Unit-Khambharkhera.**

Dear Sir,

Please find here with form (Form-4) duly filled in triplicate annual return of hazardous waste generation for the period 2021-22. Against issuance of authorization for the disposal of hazardous waste reference number; **13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021 dt. 28.02.2021**. Along with above please also find herewith Annual return of E waste Form-3 & Form VIII for annual return of Bulk Consumer of Batteries.

Thanking you,

Your's Faithfully,

For Bajaj Energy Limited.

(Authorised Signatory)

Encl.: As above

C.C.; Regional Officer UP Pollution Control Board 4th Floor, B-Block Vibhuti Khand, Gomti Nagar Lucknow-226010.

Bajaj Energy Limited
[illegible]

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FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March]

1. Name and address of facility:	**Bajaj Energy Ltd,** Unit-Khambharkhera, District-Lakhimpur Khiri.
2. Authorisation No. and Date of issue:	**13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021, Dated- 28.02.2021**
3. Name of the authorised person and full address with telephone, fax number and e-mail:	**Dharmindar Singh,** Bajaj Energy Ltd, Unit-Khambharkhera, District-Lakhimpur Khiri. (U.P.) Pin: 261506. Tel: 05872220034 Fax: 05872220034
4. Production during the year (product wise), wherever applicable	

Part A. To be filled by hazardous waste generators

1. Total quantity of waste generated category wise	Sch.-1, Cat.-5.1 (Used or spent oil)- **4515 Litter** Sch-I, Cat-3.3 (Sludge and filters contaminated with oil)- **20KG** Sch-I, Cat-33.1 (Empty barrels/containers wastes) including oil soked Cotton waste- **10KG** Sch-I, Cat-35.2 (Spent ion exchange resin)- **150Kg** Sch-I, Cat-35.3 (ETP Sludge)- **20Kg**
2. Quantity dispatched (i) to disposal facility (ii) to recycler or co-processors or pre-processor (iii) others	Sch.-1, Cat.-5.1 (Used or spent oil)- **4515 Litter** Sch-I, Cat-3.3 (Sludge and filters contaminated with oil)- **20KG** Sch-I, Cat-33.1 (Empty barrels/containers wastes) including oil soked Cotton waste- **10KG** Sch-I, Cat-35.2 (Spent ion exchange resin)- **150Kg** Sch-I, Cat-35.3 (ETP Sludge)- **20Kg**
3. Quantity utilised in-house, if any –	**NA**
4. Quantity in storage at the end of the year	**NIL**

Part B. To be filled by Treatment, storage and disposal facility operators

1. Total quantity received -	NA
2. Quantity in stock at the beginning of the year –	NA
3. Quantity treated	NA
4. Quantity disposed in landfills as such and after treatment	NA
5. Quantity incinerated (if applicable) –	NA
6. Quantity processed other than specified above –	NA
7. Quantity in storage at the end of the year –	NA

Part C. To be filled by recyclers or co-processors or other users

1. Quantity of waste received during the year (i) domestic sources (ii) imported (if applicable)	NA
2. Quantity in stock at the beginning of the year –	NA
3. Quantity recycled or co-processed or used	NA
4. Quantity of products dispatched (wherever applicable)	NA
5. Quantity of waste generated –	NA
6. Quantity of waste disposed –	NA
7. Quantity re-exported (wherever applicable)-	NA
8. Quantity in storage at the end of the year –	NA

Date-15.06.2022
Place – Lakhimpur Kheri

Signature of the Occupier or Operator of the disposal facility

Page No. 1 / 1

DUPLICATE FOR SUPPLIER

TAX INVOICE UNDER GST

(Under Section 31 of "The Central Goods & Services Tax Act' 2017")

bajaj

Bajaj Energy Limited
Unit - Shardanagar Road, Khambekhera, Shivnagar
Lakhimpur Kheri, Uttar Pradesh - 261506
GSTIN : 09AADCB4008C1ZH
PAN No : AADCB4008C

Invoice No / Date : J00550111818 /14.08.2021
Ref Invoice / Date :
Currency : INR
Place of Supply : Baghat
State of Supply / State Code : Uttar Pradesh / 09
Whether Tax Payable under Reverse Charge : No

Details of Receiver /recepient (Billed To)

Name : Indo Industries
Address : Abora, Baghat - 25xxxx

State / U.T. : Uttar Pradesh - 09
GSTIN/Unique ID : 09ABHPA9275F1ZJ
PAN No : ABHPA9275F

Details of Consignee (Shipped To)

Name : Indo Industries
Address : Abora, Baghat - 25xxxx

State / U.T. : Uttar Pradesh - 09
GSTIN/Unique ID : 09ABHPA9275F1ZJ
PAN No. : ABHPA9275F

S.No	Description of Goods Services	HSN / SAC Code	UOM	Quantity	Rate per unit	Exempted Value (Rs.)	Taxable Value (Rs.)	Total Value (Rs.)
1	OIL B GRADE USED OIL	271000	1	1515.000	28.00	0.00	42420.00	42420.00
Total				1515.000				42420.00

Remarks (If Any)	Total Taxable Value	42420.00
	CGST @ 9 %	3817.80
	SGST @ 9 %	3817.80
	Total GST	7635.60
	TCS @ 1 %	501.00
	Rounding Off	0.40

Total value (in words): Rs.Fifty Thousand Five Hundred Fifty Seven Only

Total value (in figure) 50557.00

Ack No. / Ack Date	142110580909164 / 2021-08-14 17:11:00
E-Way Bill No	471194595264
Mode Of Transport	BY ROAD
Transporter Name	NEW HIGHWAY TRANSPORT CO
LR/GR No	705/14.08.2021
Vehicle No	UP13AT-8818

Checked by:

for Bajaj Energy Limited

Authorised Signatory

* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and that there is no flow of any additional consideration involved directly or indirectly against this transaction.

Note:
1. Interest will be charged at applicable rate, if the payment is not made within the stipulated term.
2. Goods must be carefully examined in respect of quality and weight before taking delivery.
3. Our risk & responsibility ceases soon after handing over the goods to the carrier.
4. All disputes are subject to Gautam Buddha Nagar (U.P.) jurisdiction only.

Bajaj Energy Ltd
Units: 9MW (1998) & 18MW (2007 Cummins)
Corporate Office: 105-109, Bajaj Bhawan, 10th Floor, Jamnalal Bajaj Marg, 226, Nariman Point, Mumbai 400 021, Tel: +91 22 2302 6565/78 Fax: +91 22 2204 5641
Branch Office: Bajaj Bhawan, B-10, Sector 3, Jamnalal Bajaj Marg, NOIDA-201 301, Uttar Pradesh, Tel: +91-120-4045100-555, Fax: +91-120-2432294
Registered Office: Khambekhera, Shardanagar Road, Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel: +91 5872 220006 Fax: +91 5872 220041, CIN: U40102UP2006PLC030764 Web: www.bajajenergy.com

bajaj GROUP

DUPLICATE FOR SUPPLIER

TAX INVOICE UNDER GST

(Under Section 31 of "The Central Goods & Services Tax Act' 2017")

Bajaj Energy Limited
Unit :- Shardanagar Road, Khambakhera, Shrinagar,
Lakhimpur Kheri, Uttar Pradesh - 261506
GSTIN : 09AADCB4998C1ZH
PAN No. : AADCB4998C

Invoice No./ Date : 3005501119 /14.08.2021
Ref Invoice / Date :
Currency : INR
Place of Supply : Bagphat
State of Supply / State Code : Uttar Pradesh / 09
Whether Tax Payable under Reverse Charge : No

Details of Receiver /recepient (Billed To)

Name : Indo Industries
Address : Ahera, Bagphat - 250609

State / U.T. : Uttar Pradesh - 09
GSTIN Unique ID : 09ABHPA9275F1ZJ
PAN No : ABHPA9275F

Details of Consignee (Shipped To)

Name : Indo Industries
Address : Ahera, Bagphat - 250609

State / U.T. : Uttar Pradesh - 09
GSTIN Unique ID : 09ABHPA9275F1ZJ
PAN No. : ABHPA9275F

S.No	Description of Goods Serivces	HSN / SAC Code	UOM	Quantity	Rate per unit	Exempted Value (Rs.)	Taxable Value (Rs.)	Total Value (Rs.)
1	OIL B GRADE USED OIL	271000	L	3000.000	28.00	0.00	84000.00	84000.00
Total				3000.000	Total Taxable Value			84000.00

Remarks (If Any)

CGST @ 9 %	7560.00
SGST @ 9 %	7560.00
Total GST	15120.00
TCS @ . 1 %	991.00

Total value (in words): Rs.One Lakhs One Hundred Eleven Only

Total value (in figure) 100111.00

Ack No./ Ack Date	142110580649173 / 2021-08-14 17:11:00
E-Way Bill No.	481194598034
Mode Of Transport	BY ROAD
Transporter Name	NEW HIGHWAY TRANSPORT CO
LR/GR No.	705/14.08.2021
Vehicle No.	UP13AT-8518

Checked by:

for Bajaj Energy Limited

Authorised Signatory

Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and that there is no flow of any additional consideration involved directly or indirectly against this transaction.

Note

1. Interest will be charged at applicable rate, if the payment is not made within the stipulated time.
2. Goods must be carefully examined in respect of quality and weight before taking delivery.
3. Our risk & responsibility ceases soon after handling over the goods to the carrier.
4. All disputes are subject to Gautam Buddha Nagar (U.P.) jurisdiction only.

FORM - 10

[See Rule 19 (1)]

MANIFEST FOR HAZARDOUS AND OTHER WASTE

1.	Sender's Name & Mailing Address (including Phone No. and E-mail) :	Bajaj Energy Ltd. Gharda Nagar Road, Village-Khambhat Khurd, Lakhimpur Kheri 262502 (U.P)
2.	Sender's Authorisation No. :	13708/UPPCB/Lucknow/HWN/Lakhimpur Kheri/2021
3.	Manifest Document No. :	3005501118/3005601119
4.	Transporter's Name & Address (Including Phone No. & E-mail) :	New Highway Transport Company Highway Road, Lakhimpur Kheri U.P (262701) 8299932696, tasleembaig823@gmail.com
5.	Type of Vehicle :	(Truck / Tanker / Special Vehicle)
6.	Transporter's Registration No. :	09BJRPK7705H1ZA
7.	Vehicle Registration No. :	UP13 AT 8818
8.	Receiver's Name and Mailing Address (Including Phone No. and & E-mail) :	M/S Indo Industries Vill-Atwa, Chamrawal Road Baghpat (U.P)
9.	Receiver's Authorisation No. :	H06946/C-3/EPR/0-164/HWD/2017
10.	Waste Description :	Used Oil / Waste Oil
11.	Total Quantity No. of Containers :	15.15 ± 30.00 m³ or MT 21 Nos.
12.	Physical Form :	(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13.	Special Handling Instructions and Additional Information :	Do not storm from Truck. In case of leakage/ seepage use wooden peg at point of leakage/drip and inform
14.	SENDER'S CERTIFICATE : I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised, packed, marked and labeled and are in all respects in proper conditions for transport by road according to applicable national government regulations.	
	Name & Stamp : Unit Manager (Kheri)	Signature : Month: 1 4 Day: 0 8 Year: 2 0 2 1
15.	Transporter Acknowledgement of Receipt of Wastes :	
	Name & Stamp : Dal Chand	Signature : Dal Chand Month: 1 4 Day: 0 8 Year: 2 0 2 1
16.	Receiver's Certification for Receipt of Hazardous and Other Waste :	
	Name & Stamp : For INDO INDUSTRIES	Signature : Month: Day: Year:

Authorized Signatory

TAX INVOICE

Printed on 30-Dec-2021 05:09
(1st ORIGINAL FOR BUYER)

Bharat Oil & Waste Management Ltd. Gata No. 672, Vill. Kambhi, Akharpur Road, NH - 2 Kaspur-Deha,UTTAR PRADESH - 209101 STATE CODE :09 GSTIN/UIN :09AADCB1158N2ZF PAN :AADCB1158N CIN :U11201DL2007PLC160944 E-Mail :sales@bharatoil.com	Invoice No. K/SER/4670/21-22	Dated 30-Dec-2021
	Customer ID : 5668	Mode/Term of Payment
	Supplier's Ref :- 00003005212220083	Supplier's Ref Dated :- 28-Dec-2021
Buyer/ Recipient **Bajaj Energy Limited** **Unit :- Khamberkhera, Shardanagar Road, Lakhimpur,Kheri** **UTTAR PRADESH 261506, India** **GSTIN/UIN :09AADCB4998C1ZH** **PAN :AADCB4998C** **PLACE OF SUPPLY: UTTAR PRADESH - State Code: 09**	P.O. NO 0	P.O. DATE
	WTS Reference No 48727	WTS Dated 28-Dec-2021
	SEAL No :-	Vehicle No : UP31T-6562
Billing Address **Bajaj Energy Limited** **Unit :- Khamberkhera, Shardanagar Road, Lakhimpur,Kheri** **UTTAR PRADESH 261506, India** **STATE CODE :09** **GSTIN/UIN :09AADCB4998C1ZH** **PAN :AADCB4998C**	Form - 10: 54664	Eway bill : NA
	LR NO.	LR Dated
	Reverse Charge Applicable : NO	Box/Cases :

SL No	Category	Description Of Goods	HSN/SAC	Quantity	Rate (₹)	Unit	Amount (₹)
		Hazardous Waste Disposal Services					
1	35.3	Chemical sludge from waste water treatment/ETP/CETP Sludge	999432	20	5.00	KG	100.00
2	33.1	Empty barrels/containers/liners contaminated with hazardous chemicals / wastes	999432	10	7.00	KG	70.00
3	35.2	Spent ion exchange resin containing toxic metals / WTP Sludge	999432	150	25.00	KG	3,750.00
4	3.3	Sludge and Filters contaminated with oil	999432	20	17.00	KG	340.00
		Escrow Fund	999432		5%		5.00
		Total Taxable Value					4,265.00
		SGST			9%		383.85
		CGST			9%		383.85
		Round Off					0.30
		Grand Total		200.0		KG	₹ 5,033.00

Amount Chargeable (in words) : INR Five Thousand Thirty Three Rupees Only

E. & O.E

HSN/SAC	Taxable Value	Central Tax		State Tax		Total Tax Amount
		Rate (₹)	Amount (₹)	Rate (₹)	Amount (₹)	
999432	4,265.00	9.00	383.85	9.00	383.85	767.70
Total	4,265.00		383.85		383.85	767.70

Tax Amount (in words): INR Seven Hundred And Sixty Eight Rupees Only

- Declaration:
- 1. We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.
- 2. Interest @ 24% per annum payable if the bills is not cleared/paid within 07 days of presentation of the documents.
- 3. Please pay only by RTGS/NEFT/DD/Cheque; IF DD/Cheque then Please mail to BOWML,Attn: Accounts, 11 LGF, Community Center, East Of Kailash, New Delhi 110065. Tel: 011-41000710/26216495/9717706048 sales@bharatoil.com
- 4. Bill/ Invoice is final, if no dispute notified in writing with in 7 days of invoice.

- Company's Bank Details:
- Bank Name : Axis Bank Limited
- A/C NO. : 909020031262864
- Branch Add : Lajpa. Nagar,New Delhi
- IFS Code : UTIB0000126

for Bharat Oil & Waste Management Ltd.

Sonia Gandhi
Senior Accountant
sales@bharatoil.com

Digitally Signed By:Sonia Gandhi
Date: 2021-12-30 15:30:01
IP: 116.100.48.34
ID: 9402031B4QOnP3QEby,Pyslogic
Click here to E-verify

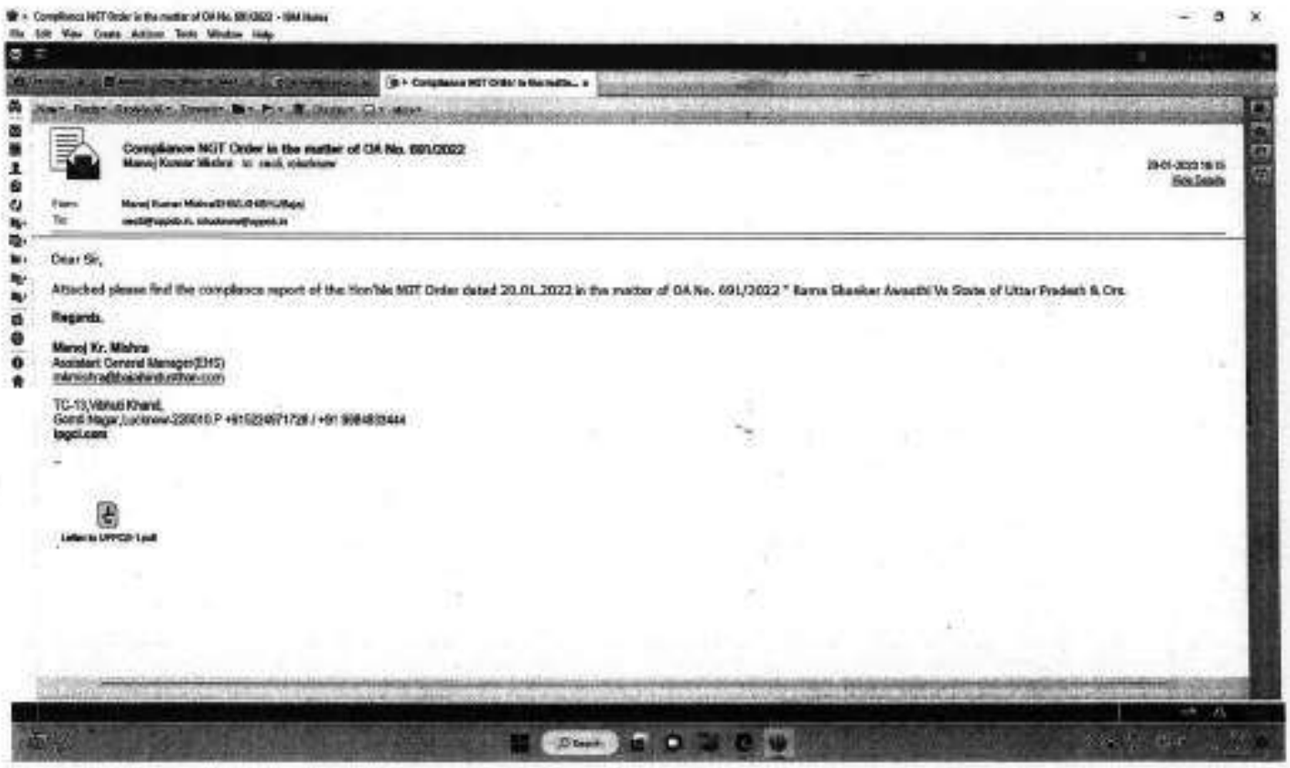
K/SER/4670/21-22 BOWML

FORM 10
[See rule 19 (1)]
MANIFEST FOR HAZARDOUS AND OTHER WASTE

Copy for Operator of Facility
S.No.: 54664

1 Occupier's Name & Mailing Address (including Phone No. and email)	BAJAJ ENERGY Ltd, Sharda Nagar Road, Vill - Khamkhera, Khurd Lakhimpur Kheri, U.P - 261506
2 Sender's Authorization No.	3726/UPPCB/Lucknow/HWM/Lakhimpur Kheri/2021
3 Manifest Document No.	300571222200088
4 Transporter's Name & Address (including Phone No. and email)	Virendra Singh 8115866100
5 Type of Vehicle	(Truck / Tanker / Special Vehicle)
6 Transporter's Registration	
7 Vehicle Registration No.	UP 31 T 6562
8 Receiver's Name & Mailing Address (including Phone No. and email) CIN-U11201DL2007PLC160944	(I) BHARAT OIL COMPANY (E-18, Site-IV, Sahibabad Indus Ghaziabad, UP-201010 Tel.: 01 e-mail:sales@bharatoil.com
(II) BHARAT OIL & WASTE MANAGEMENT LTD. Mauza Muklimpur, Roorkee-Lakshar Road, Roorkee - 247664 UK, Tel. :08874207664 e-mail:sales@bharatoil.com	(III) BHARAT OIL & WASTE MANAGEMENT LTD. Plot # 672, Sikandra Road, NH-2, Kumbhi Village, Tehsil Akbarpur, Kanpur Dehat, UP, Tel : 0512-2285296 e-mail:sales@bharatoil.com
9 Receiver's Authorization No.	(I) 1486/UPPCB/Ghaziabad(UPPCBRO)/HWM/GHAZIABAD/2018 Valid upto: 03/05/2023
(II) UEPPCB/HO/Con-B-54/2018/548 Valid upto: 31/03/2023	(III) 1403/UPPCB/Kanpur Dehat(UPPCBRO)/HWM/KANPUR DEHAT/2018 Valid upto:19/04/2023
10 Waste Description	Used Resin, ETP Sludge, Empty barrel, Oil Soaked Used Filter
11 Total Quantity No. of Containers	Used Resin-150 kg, ETP Sludge-20 kg (I) or Kg Empty barrel 10 kg Nos. Total-0.20MT Oil Soaked Filter 20k 05 Bags
12 Physical Form	(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13 Special Handling Instructions & Additional Information	Do not throw Drums from truck. In case of leakage/ seapage, use Washing soap at point of leak to stop its leakage.
14 SENDER'S CERTIFICATE	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised packed, marked, and labeled, and are in all respects in proper condition for transport by road
Typed Name & Stamp : Signature :	Month: 1 8 Day: 1 2 Year: 2 0 2 1
15 Transporter Acknowledgement of Receipt of Waste	Month: 1 8 Day: 1 2 Year: 2 0 2 1
Typed Name & Stamp : Signature :	
16 Receiver's Certificate for Receipt of Hazardous and other Waste	Month: 1 8 Day: 1 2 Year: 2 0 2 1
Typed Name & Stamp : Signature :	

Annexure – 2



Compliance NGT Order in the matter of OA No. 691/2022

Dear Sir,

Attached please find the compliance report of the Hon'ble NGT Order dated 20.01.2022 in the matter of OA No. 691/2022 " Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors.

Regards.

Manoj Kr. Mishra
Assistant General Manager(EHS)

TC-13,Vibhuti Khand,
Gomti Nagar,Lucknow-226010 P +915248071728 / +91 9084835444
lpgcl.com

bajaj ENERGY

Ref: BEL/KKH/EHS/2022/27

Dated: 15.06.2022

To,

The Member Secretary
U.P. Pollution Control Board,
Picup Bhawan, 3rd Floor, B-Block
Vibhuti Khand, Gomti Nagar,
LUCKNOW – 226 010

Sub: **Annual return of hazardous waste generation of our Bajaj Energy Limited Unit-Khambharkhera.**

Dear Sir,

Please find here with form (Form-4) duly filled in triplicate annual return of hazardous waste generation for the period 2021-22. Against issuance of authorization for the disposal of hazardous waste reference number; **13700/UPPCB/Lucknow(UPPCBRO)/HWM/LAKHIMPUR KHIRI/2021 dt. 28.02.2021.** Along with above please also find herewith Annual return of E waste Form-3 & Form VIII for annual return of Bulk Consumer of Batteries.

Thanking you,

Your's Faithfully,

For Bajaj Energy Limited.

(Authorised Signatory)

Encl.: As above

22/6/22

डाक प्राप्ति रसीद
प्राप्ति दिनांक 22-6-22
प्राप्तकर्ता के हस्ताक्षर
उ.प्र. प्रदूषण नियंत्रण बोर्ड, लखनऊ

C.C.; Regional Officer UP Pollution Control Board 4th Floor, B-Block Vibhuti Khand, Gomti Nagar Lucknow-226010.

bajaj ENERGY

Ref. No. BEL/KKH/NGT/02-2023 January 20, 2023

To,

The Chief Environmental Officer
Circle-5,
Uttar Pradesh Pollution Control Board,
TC-12 V, Vibhuti Khand,
Gomti Nagar, Lucknow

Sub: Regarding compliance of Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others

Dear Sir,

With reference to the Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we would like to inform you that we have already constructed Hazardous Waste Storage shade as per the guidelines mentioned in Hazardous Waste Management and Transboundary Rules 2016 and the hazardous waste is being disposed as per the guidelines mentioned in the Rule through TSDF.

Membership Certificate alongwith some photographs are attached herewith as annexure 1 & 2 for your information.

Thanking you,

Yours faithfully,
For Bajaj Energy Ltd.
Unit: Khamberkhera, Lakhimpur Kheri (UP)

(Authorized Signatory)

End.: As above

Copy to:

1. The Member Secretary, UPPCB, Lucknow
2. The Regional Director (Central Region), CPCB, Lucknow
3. The Regional Officer, UPPCB, Lucknow

डाक प्राप्ति रसीद
प्राप्ति दिनांक 23/1/2023
प्राप्तकर्ता के हस्ताक्षर
उ०प्र० प्रदूषण नियंत्रण बोर्ड, लखनऊ

23/1/2023
केन्द्रीय प्रदूषण नियंत्रण बोर्ड
क्षेत्रीय निदेशालय
पिकप भवन, विभूति खण्ड, गोमती नगर
लखनऊ-226010

Annexure – 1

Bharat Oil & Waste Management Ltd.

MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

Gata No. 672,706Cha Vill. Kumbhi,Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

One may verify 'active' membership by calling

Bharat Oil & Waste Management Ltd. at

011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

BOWML/K/3785/20

For Bharat Oil & Waste Management Ltd.

Authorized Signatory

For Bharat Oil & Waste Management Ltd.

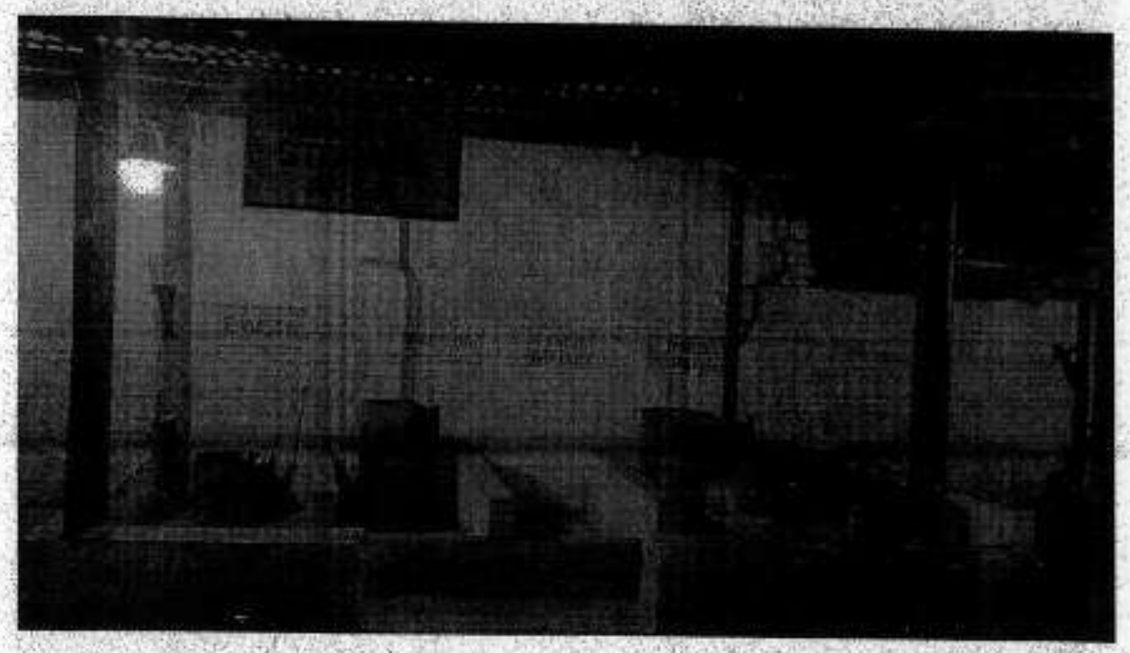
Authorized Signatory

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065, India
Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41060710, 26210205 Telefax : 26216466
Email : sales@bharatoil.com www.bharatoil.com

Facilities :
- E - 18, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Makimpur Roorkee-Lakshar Road Roorkee - 247667 (UK)
- SIDCUL - Haridwar. (UK)

Annexure – 2





Annexure – 3





Annexure – 4



MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

Gata No. 672,706Cha Vill. Kumbhi, Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

BOWML/K/3785/20

One may verify 'active' membership by calling

Bharat Oil & Waste Management Ltd. at

011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

For **Bharat Oil & Waste Management Ltd.**

Pragati Rohtagi
Sales Cordinator
sales@bharatoil.com

Authorized Signatory

For **Bharat Oil & Waste Management Ltd.**

Sunder K Kukreja
GM (Admin & Fin.)
sales@bharatoil.com

Authorized Signatory

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065, India
Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41000710, 26210205 Telefax : 26219468
Email : sales@bharatoil.com **www.bharatoil.com**

Facilities :
- E - 16, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Mukimpur Roorkee-Laksher Road Roorkee - 247664 (UK)
- SIDCUL - Haridwar (UK)

Annexure – 5

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Lab : RI-457, State Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Alwar (Rajasthan) 301019

Ph. No. : 01493-294822, 09694656022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/300822/W/01	Reporting Date : 05.09.2022
Issued to: M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, LAKHIMPUR , (U.P.) INDIA	Sample I'd : AEL/BEL/300822/W/01 Date : 30.08.2022 Period of Testing 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Type of the Sample	Raw Water Sample
Date of Sampling	27.08.2022
Point of Sample Collection	From Ash Pond
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Weather Condition	Clear

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specifications (As per IS:10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 23rd Ed.,2120 B
2	Odour	–	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	–	Agreeable	Agreeable	Agreeable	IS-3025(P-7)
4	Turbidity	NTU	<1	1 max.	5 max.	APHA 23rd Ed.,2130 B
5	pH	–	7.44	6.5 – 8.5	No relaxation	APHA 23rd Ed.,4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	163.0	200 max.	600 max.	APHA 23rd Ed.,2340 C
7	Iron,(as Fe)	mg/l	<0.05	0.30 max.	No relaxation.	APHA 23rd Ed.,3111
8	Chloride,(as Cl)	mg/l	10.0	250 max.	1000 max.	APHA 23rd Ed.,4500 Cl B
9	Residual Free Chlorine	mg/l	N.D.	0.20 min.	1 max.	IS-3025(P-26)
10	Calcium Hardness, (as Ca)	mg/l	36.8	75 max.	200 max.	APHA 23rd Ed.,3500 Ca A
11	Magnesium Hardness,(as Mg)	mg/l	17.35	30 max.	100 max.	APHA 23rd Ed.,3500 Mg B
12	Total Dissolved Solids	mg/l	240.0	500 max.	2000 max.	APHA 23rd Ed.,2540 C
13	Sulphate,(as SO_4)	mg/l	25.6	200 max.	400 max.	APHA 23rd Ed.,4500 SO4 E
14	Fluoride,(as F)	mg/l	0.20	1.0 max.	1.5 max.	APHA 23rd Ed.,4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	250.0	200 max.	600 max.	APHA 23rd Ed.,2320 A

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Samples will be destroyed one month from the date of issue of test certificate.
3. Any complaint whatsoever in connection with / right of issue of this report
4. The report is not to be reproduced wholly or in part and can not be used as an evidence in the Court of law and should not be used in any advertising media without any special permission in writing.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

[redacted]

Lab - H5-537, Near Pollution Control Board, RIICO Industrial Area, Shiwadi, Dist. Alwar (Rajasthan) 301019

Ph. No. : 01493-254632, 09694588012, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/BKL/0082022/W/01 — Reporting Date : 05.09.2022

16	Chromium Total (as Cr)	mg/l	<0.05	0.05 max.	No relaxation	IS 3025 (P-52)
17	Hexa Chromium (as Cr+6)	mg/l	<0.05	0.05 max.	No relaxation	APHA 23rd Ed. 3500 Cr B
18	Nitrate (as NO_3)	mg/l	1.64	45 max.	No relaxation	IS-3025(P-34)
19	Zinc (as Zn)	mg/l	<0.1	5 max.	15 max.	IS-3025(P-49)
20	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	IS-3025(P-43)
21	Copper (as Cu)	mg/l	<0.05	0.05 max.	1.50 max.	IS-3025(P-42)
22	Manganese (as Mn)	mg/l	<0.1	0.10 max.	0.30 max.	APHA 23rd Ed. 3500 Mn B
23	Arsenic (as As)	mg/l	N.D.	0.01 max.	0.05 max.	IS-3025(P-37)
24	Aluminum (as Al)	mg/l	N.D.	0.03 max.	0.20 max.	IS-3025(P-55)
25	Ammonia (as total ammonia-N)	mg/l	N.D.	0.5 max.	No relaxation	IS 3025 (P-34)
26	Lead (as Pb)	mg/l	N.D.	0.01 max.	No relaxation	APHA 23rd Ed. 3111 B
27	Cadmium (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	IS-3025(P-41)
28	Cyanide (as CN)	mg/l	<0.01	0.05	No Relaxation	IS-3025(P-27)
29	Selenium (as Se)	mg/l	N.D.	0.01 max.	No relaxation	IS-3025(P-56)
30	Barium (as Ba)	mg/l	<0.1	0.7	No Relaxation	IS: 13302
31	Boron (as B)	mg/l	< 0.2	0.5 max.	1.0 max.	APHA 23rd Ed. 4500 B C
32	Mercury (as Hg)	mg/l	N.D.	0.001 max.	No relaxation	IS-3025(P-48)
33	Anionic surface Detergents (as MBAS)	mg/l	<0.1	0.2	1.0	Annex K of IS-13428
34	Chloramines (as Cl_2)	mg/l	<1.0	4.0	No Relaxation	IS: 3025(P-26)
35	Mineral Oil	mg/l	<0.5	0.5	No Relaxation	Clause 8 of IS: 3025
36	Molybdenum (Mo)	mg/l	<0.05	0.07	No Relaxation	IS-3025(P-2)
37	Nickel (as Ni)	mg/l	<0.01	0.02	No Relaxation	Annex I of IS-13428
38	Polynuclear Aromatic	mg/l	<0.0001	0.0001	No Relaxation	APHA 6440
39	Poly chlorinated biphenyl	mg/l	<0.0001	0.0005	No Relaxation	APHA 6630
Bacteriological Test Results						
40	Coliform organisms /100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
41	E-Coli/ 100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016

Remarks- N.D- Not Detectable

Checked By

Authorised Signatory

Note: 1. The result listed refer only to the sample analysed and not to other parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
3. Any complaint about this report should be communicated within 7 days of issue of this report.
4. This report is Not to be reproduced wholly or in part and use for any commercial purpose without written approval.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Lab : H1-837, Near Pollution Control Board, PIDC Industrial Area, Vitthavdi, Dist. Anand (Gujarat)-388119

Ph. No. : 01483-294822, 09904668822, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/300822/W/03	Reporting Date : 05.09.2022
Issued to: M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, LAKHIMPUR, (U.P) INDIA	Sample I'd : AEL/BEL/300822/W/03 Date : 30.08.2022 Period of Testing: 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Type of the Sample	River Water Sample
Date of Sampling	27.08.2022
Point of Sample Collection	From Kandava River
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Weather Condition	Clear

TEST RESULTS:

Sr. no.	Parameters	Unit	Results	Drinking Water Specifications (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 23rd Ed.2120 B
2	Odour	—	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	—	Agreeable	Agreeable	Agreeable	IS-3025(P-7)
4	Turbidity	NTU	<1	1 max.	5 max	APHA 23rd Ed.2130 B
5	pH	—	7.48	6.5 – 8.5	No relaxation	APHA 23rd Ed.4500 H B
6	Total Hardness.(as $CaCO_3$)	mg/l	188.1	200 max.	600 max.	APHA 23rd Ed.2340 C
7	Iron.(as Fe)	mg/l	<0.05	0.30 max.	No relaxation.	APHA 23rd Ed.3111
8	Chloride.(as Cl)	mg/l	13.0	250 max.	1000 max.	APHA 23rd Ed.4500 Cl B
9	Residual Free Chlorine	mg/l	N.D.	0.20 min.	1 min	IS-3025(P-26)
10	Calcium Hardness. (as Ca)	mg/l	44.0	75 max.	200 max.	APHA 23rd Ed.3500 Ca B
11	Magnesium Hardness.(as Mg)	mg/l	18.57	30 max.	100 max.	APHA 23rd Ed.3500 Mg B
12	Total Dissolved Solids	mg/l	336.0	500 max.	2000 max.	APHA 23rd Ed.2540 C
13	Sulphate.(as SO_4)	mg/l	24.2	200 max.	400 max.	APHA 23rd Ed.4500 SO4 E
14	Fluoride.(as F)	mg/l	0.15	1.0 max.	1.5 max.	APHA 23rd Ed.4500
15	Total Alkalinity.(as $CaCO_3$)	mg/l	244.3	200 max.	600 max.	APHA 23rd Ed.2320 A

Note: 1. This report is related only to the tested samples and applicable parameters.
2. Sample will be disposed one month from the date of issue of this certificate.
3. Any complaint about this report should be communicated within 7 days of issue of this report.
4. The report is not to be reproduced wholly or in part and not to be used as an evidence in the Court of Law and should not be used in any advertising media without our special permission in writing.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Lab - H1-837, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Distt. Alwar (Rajasthan)-301019

Ph. No. : 01493-294032, 09694666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/BRI /30052022/W/02 — **Reporting Date : 05.09.2022**

16	Chromium Total (as Cr)	mg/l	<0.05	0.05 max.	No relaxation	IS 3025 (P. 52)
17	Hexa Chromium (as Cr+6)	mg/l	<0.05	0.05 max.	No relaxation	APHA 23rd Ed. 3500 Cr B
18	Nitrate (as NO_3)	mg/l	1.2	45 max.	No relaxation	IS-3025(P-34)
19	Zinc (as Zn)	mg/l	< 0.1	5 max.	15 max.	IS-3025(P-49)
20	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	IS-3025(P-43)
21	Copper (as Cu)	mg/l	<0.05	0.05 max.	1.50 max.	IS-3025(P-42)
22	Manganese (as Mn)	mg/l	<0.1	0.10 max.	0.30 max.	APHA 23rd Ed.3500 Mn B
23	Arsenic (as As)	mg/l	N.D.	0.01 max.	0.05 max.	IS-3025(P-37)
24	Aluminum (as Al)	mg/l	N.D.	0.03 max.	0.20 max.	IS-3025(P-55)
25	Ammonia (as total ammonia-N)	mg/l	N.D.	0.5 max.	No relaxation	IS:3025 (P-34)
26	Lead (as Pb)	mg/l	N.D.	0.01 max.	No relaxation	APHA 23rd Ed. 3111 B
27	Cadmium (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	IS-3025(P-41)
28	Cyanide (as CN)	mg/l	<0.01	0.05	No Relaxation	IS-3025(P-27)
29	Selenium (as Se)	mg/l	N.D.	0.01 max	No relaxation	IS-3025(P-56)
30	Barium (as Ba)	mg/l	<0.1	0.7	No Relaxation	IS: 15302
31	Boron. (as B)	mg/l	< 0.2	0.5 max	1.0 max	APHA 23rd Ed.4500 B C
32	Mercury (as Hg)	mg/l	N.D.	0.001 max	No relaxation	IS-3025(P-48)
33	Anionic surface (detergents) as MBAS)	mg/l	<0.1	0.2	1.0	Annex K of IS-13428
34	Chloramines (as Cl_2)	mg/l	<1.0	4.0	No Relaxation	IS: 3025 (P-26)
35	Mineral Oil	mg/l	<0.5	0.5	No Relaxation	Clause 6 of IS: 3025
36	Molybdenum (Mo)	mg/l	<0.05	0.07	No Relaxation	IS-3025(P-2)
37	Nickel (as Ni)	mg/l	<0.01	0.02	No Relaxation	Annex L of IS-13428
38	Polynuclear Aromatic	mg/l	<0.0001	0.0001	No Relaxation	APHA 6440
39	Poly chlorinated biphenyl	mg/l	<0.0001	0.0005	No Relaxation	APHA 6630
Bacteriological Test Results						
40	Coli form organisms /100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
41	E-Coli/100 ml	--	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016

Remarks: ND- Not Detectable

Checked By

Authorised Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Samples will be destroyed one month from the date of issue of test certificate.
3. Any complaints about this report should be communicated within 7 days of issue of this report.
4. This report in full or in part may not be used as an evidence in the Court of law and should not be used in any advertising.
Media without our special permission in writing.

ASIA ENVIRO LAB
(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)
Lab : RIICO Industrial Area, Dahead, Dist. Alwar (Rajasthan)-301019
Ph. No. : 01493-294022, 09024666022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/300822/W/04	Reporting Date : 05.09.2022
Issued to: M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, LAKHIMPUR , (U.P) INDIA	Sample I'd : AEL/BEL/300822/W/04 Date : 30.08.2022 Period of Testing: 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Type of the Sample	Raw Water Sample
Date of Sampling	27.08.2022
Point of Sample Collection	From Power Plant Gate No.- 01
Sample Collected By	Lab Rep.
Purpose of Analysis	Monitoring
Weather Condition	Clear

TEST RESULTS:

Sr. No.	Parameters	Unit	Results	Drinking Water Specification (As per IS-10500)		Test Protocol
				Desirable Limits	Permissible Limits in the absence of better alternate source	
1	Colour	Hazen	<5	5 max.	15 max.	APHA 23rd Ed.2120 B
2	Odour	--	Agreeable	Agreeable	Agreeable	IS-3025(P-5)
3	Taste	--	Agreeable	Agreeable	Agreeable	IS-3025(P-7)
4	Turbidity	NTU	<1	1 max.	5 max.	APHA 23rd Ed.2130 B
5	pH	--	7.42	6.5 - 8.5	No relaxation	APHA 23rd Ed.4500 H B
6	Total Hardness,(as $CaCO_3$)	mg/l	616	200 max.	600 max.	APHA 23rd Ed.2340 C
7	Iron,(as Fe)	mg/l	0.58	0.30 max.	No relaxation	APHA 23rd Ed.3111
8	Chloride,(as Cl)	mg/l	66.0	250 max.	1000 max.	APHA 23rd Ed.4500 ClB
9	Residual Free Chlorine	mg/l	N.D.	0.20 max.	1 max	IS-3025(P-26)
10	Calcium Hardness, (as Ca)	mg/l	122.2	75 max.	200 max.	APHA 23rd Ed.3500 Ca B
11	Magnesium Hardness,(as Mg)	mg/l	73.8+	30 max.	100 max.	APHA 23rd Ed.3500 Mg B
12	Total Dissolved Solids	mg/l	1080	500 max.	2000 max.	APHA 23rd Ed.2540 C
13	Sulphate,(as SO_4)	mg/l	169.8	200 max.	400 max.	APHA 23rd Ed.4500 SO4 E
14	Fluoride,(as F)	mg/l	1.74	1.0 max.	1.5 max.	APHA 23rd Ed.4500
15	Total Alkalinity,(as $CaCO_3$)	mg/l	308.4	200 max	600 max.	APHA 23rd Ed.2320 A

Note: 1. The results listed refer only to the tested samples and applicable parameters.
2. Samples will be destroyed one month from the date of issue of test certificate.
3. Any complaints about this report should be communicated within 7 days of issue of the report.
4. The report is not to be reproduced wholly or in part and not for use as an evidence in the Court of law and should not be used in any misleading manner without our agreement permission in writing.

ASIA ENVIRO LAB
(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)
Lab - H1-637, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Dist. Alwar (Rajasthan)-301019
Ph. No. : 01493-294022, (0)9414566022, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Report No.: AEL/BEL/08082022/W/03 — Reporting Date : 05.09.2022

16	Chromium Total (as Cr)	mg/l	<0.05	0.05 max.	No relaxation	IS 3025 (P-52)
17	Hexa Chromium (as Cr+6)	mg/l	<0.05	0.05 max.	No relaxation	APHA 23rd Ed.3500 Cr-B
18	Nitrate (as NO_3)	mg/l	2.48	45 max.	No relaxation	IS-3025(P-34)
19	Zinc (as Zn)	mg/l	< 0.1	5 max.	15 max.	IS-3025(P-49)
20	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	0.001 max.	0.002 max.	IS-3025(P-43)
21	Copper (as Cu)	mg/l	<0.05	0.05 max.	1.50 max.	IS-3025(P-42)
22	Manganese (as Mn)	mg/l	<0.1	0.10 max.	0.30 max.	APHA 23rd Ed.3500 Mn B
23	Arsenic (as As)	mg/l	N.D.	0.01 max.	0.05 max.	IS-3025(P-37)
24	Aluminum (as Al)	mg/l	N.D.	0.03 max.	0.20 max.	IS-3025(P-55)
25	Ammonia (as total ammonia-N)	mg/l	N.D.	0.5 max.	No relaxation	IS 3025 (P-34)
26	Lead (as Pb)	mg/l	N.D.	0.01 max.	No relaxation	APHA 23rd Ed. 3111 B
27	Cadmium (as Cd)	mg/l	N.D.	0.003 max.	No relaxation	IS-3025(P-41)
28	Cyanide (as CN)	mg/l	<0.01	0.05	No Relaxation	IS-3025(P-27)
29	Selenium (as Se)	mg/l	N.D.	0.01 max.	No relaxation	IS-3025(P-56)
30	Barium (as Ba)	mg/l	<0.1	0.7	No Relaxation	IS. 15303
31	Boron, (as B)	mg/l	< 0.2	0.5 max.	1.0 max.	APHA 23rd Ed. 4500 B C
32	Mercury, (as Hg)	mg/l	N.D.	0.001 max.	No relaxation	IS-3025(P-48)
33	Anionic surface Detergents (as MBAS)	mg/l	<0.1	0.2	1.0	Annex K of IS-13428
34	Chloramines (as Cl_2)	mg/l	<1.0	4.0	No Relaxation	IS: 3025 (P- 26)
35	Mineral Oil	mg/l	<0.5	0.5	No Relaxation	Clause 6 of IS: 9025
36	Molybdenum (Mo)	mg/l	<0.05	0.07	No Relaxation	IS-3025(P-2)
37	Nickel (as Ni)	mg/l	<0.01	0.02	No Relaxation	Annex L of IS-13428
38	Polynuclear Aromatic	mg/l	<0.0001	0.0001	No Relaxation	APHA 6440
39	Poly chlorinated biphenyl	mg/l	<0.0001	0.0005	No Relaxation	APHA 6630
Bacteriological Test Results						
40	Coli form organisms /100 ml	—	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016
41	E-Coli/ 100 ml	—	Absent	Shall not be detectable in any 100 ml sample		IS-15185:2016

Remarks- NR- Not Reportable

Checked By

Authorized Signatory

Note: 1. The result listed refer only to the tested sample and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
3. Any complaint about this report should be received within 7 days of issue of this report.
4. This report is not to be reproduced wholly or in part and is not to be used as evidence in the Court of Law and shall not be used in any advertising media without any mutual permission in writing.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Lab - 151-537, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Dist. Alwar Rajasthan-301019

Ph. No. : 01493-294022, 09694699922, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BHL/300R2022/SOIL/01	Reporting Date : 05.09.2022
Issued to: M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMDIHAR KHERA, SHRINAGAR, LAKHIMPUR, (U.P) INDIA	Sample I'd : AEL/BHL/300822/SOIL/01 Date : 30.08.2022 Period of Testing: 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Sample Description	Soil Sample
Sampling Location	Soil Sample from Ash Pond
Date of Sampling	27.08.2022
Purpose of Analysis	Monitoring

TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit
1.	pH(1:5 suspension)	IS:2720(Part-26)	7.54	-
2.	Electrical Conductivity at 25°C (1:5suspension.)	IS:2720(Part-21)	576	µS/cm
3.	Calcium (as Ca)	STP/SOIL	1682	mg/kg
4.	Magnesium(as Mg)	STP/SOIL	190	mg/kg
5.	Sodium (as Na)	STP/SOIL	150	mg/kg
6.	Potassium(as K)	STP/SOIL	249	mg/kg
7.	Water holding Capacity	STP/SOIL	26.8	%, by mass
8.	Chloride (as Cl)	STP/SOIL	225	mg/kg
9.	Sulphate (as SO4)	STP/SOIL	193	mg/kg
10.	Nitrate (as NO3)	STP/SOIL	18.57	mg/kg
11.	Alkalinity (as CaCO3)	STP/SOIL	374	mg/kg
12.	Iron Content (as Fe)	STP/SOIL	55.8	mg/kg
13.	Phosphorus (as P_2O_5)	STP/SOIL	126	mg/kg
14.	Bulk Density	STP/SOIL	1.29	gm /cc
15.	Moisture Content	STP/SOIL	15.54	% by mass
16.	Organic Matter	STP/SOIL	0.84	% by mass

Remark:- ND-Not Detectable

Checked By

ASIA ENVIRO LAB BHIWADI

Authorised Signatory

Note: 1. The result (s) relate only to the tested samples and applicable parameters.
2. Sample will be destroyed two month from the date of issue of test certificate.
3. Any complaints about this report should be communicated within 7 days of issue of this report.
4. This report cannot be reproduced totally or in part and can not be used as evidence in the Court of law and should not be used in any advertising, media, publicity and special promotion, in any form.

ASIA ENVIRO LAB

(An ISO 9001:2015, 14001:2015, 45001:2018 & MOEF Accredited Lab)

Lab - H1-687, Near Pollution Control Board, RIICO Industrial Area, Bhiwadi, Dist. Alwar (Rajasthan)-301019

Ph. No. : 01493-294822, 09654866822, Email : asiaenvirolab@gmail.com, Website : www.asiaenvirolab.com

Test Report

Report No.: AEL/BEL/30082022/SOIL/02	Reporting Date : 05.09.2022
Issued to: M/S. BAJAJ ENERGY LIMITED SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, LAKHIMPUR, (U.P) INDIA	Sample I'd : AEL/BEL/30082022/SOIL/02 Date : 30.08.2022 Period of Testing: 30.08.2022 To 05.09.2022

SAMPLE PARTICULARS:	
Sample Description	Soil Sample
Sampling Location	Soil Sample from Near Coal Storage Yard
Date of Sampling	27.08.2022
Purpose of Analysis	Monitoring

TEST RESULTS

S. No.	Parameters	Test Method	Result	Unit
1.	pH(1:5 suspension)	IS:2720(Part-26)	7.69	-
2.	Electrical Conductivity at 25°C (1:5suspension)	IS:2720(Part-21)	642	µS/cm
3.	Calcium (as Ca)	STP/SOIL	1767	mg/kg
4.	Magnesium(as Mg)	STP/SOIL	202	mg/kg
5.	Sodium (as Na)	STP/SOIL	166	mg/kg
6.	Potassium(as K)	STP/SOIL	258	mg/kg
7.	Water holding Capacity	STP/SOIL	22.5	% by mass
8.	Chloride (as Cl)	STP/SOIL	270	mg/kg
9.	Sulphate (as SO4)	STP/SOIL	216	mg/kg
10.	Nitrate (as NO3)	STP/SOIL	21.84	mg/kg
11.	Alkalinity (as CaCO3)	STP/SOIL	406	mg/kg
12.	Iron Content (as Fe)	STP/SOIL	51.3	mg/kg
13.	Phosphorus (as P_2O_5)	STP/SOIL	135	mg/kg
14.	Bulk Density	STP/SOIL	1.37	gm /cc
15.	Moisture Content	STP/SOIL	12.89	% by mass
16.	Organic Matter	STP/SOIL	1.07	% by mass

Remark: - ND-Not Detectable

Checked By

For ASIA ENVIRO LAB
Authorised Signatory

Note: 1. The result listed refer only to the tested samples and applicable parameters.
2. Sample will be destroyed one month from the date of issue of test certificate.
3. Any calculation error in this report should be communicated within 7 days of issue of this report.
4. The report is for the exclusive use of party and may not be used as an evidence in the Court of Law unless specified but we shall be not responsible for any misuse of the report.

Annexure – 1



MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

Gata No. 672,706Cha Vill. Kumbhi,Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

BOWML/K/3785/20

One may verify 'active' membership by calling

Bharat Oil & Waste Management Ltd. at

011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

For **Bharat Oil & Waste Management Ltd.**

Pragati Rohtagi
Sales Cordinator
sales@bharatoil.com
Digitally Signed By:Pragati Rohtagi
Date: 2022-12-22 09:52:54
IP: 49.36.182.174
Click here to E-verify

Authorized Signatory

For **Bharat Oil & Waste Management Ltd.**

Surinder K Kukreja
GM (Admin & Fin.)
sales@bharatoil.com
Digitally Signed By:Surinder K Kukreja
Date: 2022-12-22 09:00:39
IP: 49.36.182.174
Click here to E-verify

Authorized Signatory

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065, India

Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41000710, 26210205 Telefax : 26216466

Email : sales@bharatoil.com www.bharatoil.com

Facilities :
- E - 16, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Mukimpur Roorkee-Lakshar Road Roorkee - 247664 (UK)
- SIDCUL - Haridwar (UK)

bajaj ENERGY

Ref. No. BEL/KKH/NGT/02-2023 January 20, 2023

To,

The Chief Environmental Officer
Circle-5,
Uttar Pradesh Pollution Control Board,
TC-12 V, Vibhuti Khand,
Gomti Nagar, Lucknow

Sub: Regarding compliance of Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others

Dear Sir,

With reference to the Hon'ble NGT order dated 20.01.2023 in the matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we would like to inform you that we have already constructed Hazardous Waste Storage shade as per the guidelines mentioned in Hazardous Waste Management and Transboundary Rules 2016 and the hazardous waste is being disposed as per the guidelines mentioned in the Rule through TSDF.

Membership Certificate alongwith some photographs are attached herewith as annexure 1 & 2 for your information.

Thanking you,

Yours faithfully,
For Bajaj Energy Ltd.
Unit: Khamberkhera, Lakhimpur Kheri (UP)

(Authorized Signatory)

Encl.: As above

डाक प्राप्ति रसीद
प्राप्ति दिनांक 23/1/2023
प्राप्तकर्ता के हस्ताक्षर
उ०प्र० प्रदूषण नियंत्रण बोर्ड, लखनऊ

23/1/2023
केन्द्रीय प्रदूषण नियंत्रण बोर्ड
क्षेत्रीय कार्यालय
विकल्प भवन, विभूति खण्ड, गोमती नगर
लखनऊ-226010

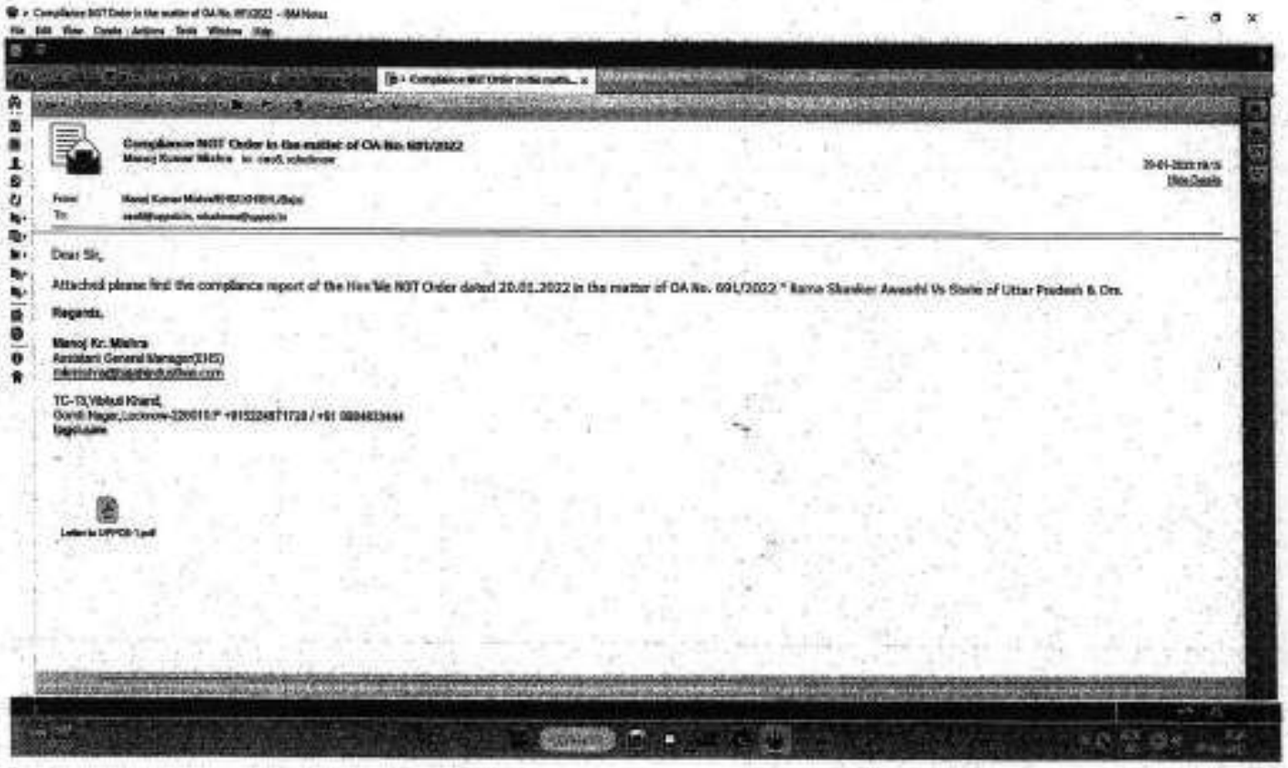
Copy to:

1. The Member Secretary, UPPCB, Lucknow
2. The Regional Director (Central Region), CPCB, Lucknow
3. The Regional Officer, UPPCB, Lucknow

30/1/2023

bajaj GROUP
THINK TOMORROW

Annexure – 2



Compliance NGT Order in the matter of OA No. 69/L/2022

Manoj Kumar Mishra to ravi5, vikasbnsp

From: Manoj Kumar Mishra/BYKO-HRD/Bajaj

To: ravi5@uppcbnic, vikasbnsp@uppcb.in

Dear Sir,

Attached please find the compliance report of the Hon'ble NGT Order dated 20.01.2022 in the matter of OA No. 69/L/2022 " Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors.

Regards,

Manoj Kr. Mishra
Assistant General Manager(EHS)
mkmishra@bajajhindusthan.com

TC-13,Vibhuti Khand,
Gomti Nagar,Lucknow-226010,P +915224871728 / +91 9984633444
bgcl.in/sm

Letter to UPPCB-1.pdf

Annexure – 1

Bharat Oil & Waste Management Ltd.

Petroleum Refining, Hazardous Waste Management & Incineration
Refiners & Manufacturers of Industrial Lubricating Oils

MEMBERSHIP CERTIFICATE

M / s. Bajaj Energy Limited

Unit :- Khamberkhera, Shardanagar Road, Lakhimpur Kheri-261506, UP

is a registered member of our facility

BOWML/K/3785/20

Gata No. 672,706Cha Vill. Kumbhi,Akbarpur Road, NH-2 Kanpur-Dehat-209101, UP

for safe, legal & scientific Disposal of Hazardous Waste

Member # : BOWML/K/3785/20

Expiry Date : May 24, 2023

Scan & Verify

BOWML/K/3785/20

One may verify 'active' membership by calling

Bharat Oil & Waste Management Ltd. at

011-4100 0710, 2981 6466 or Email: sales@bharatoil.com

For **Bharat Oil & Waste Management Ltd.**

Pragati Rohtagi
Sales Cordinator
sales@bharatoil.com
Digitally Signed By:Pragati Rohtagi
Date: 2022-12-22 09:52:54
Click here to E-verify

Authorized Signatory

For **Bharat Oil & Waste Management Ltd.**

Surinder K Kukreja
GM (Admin. & Fin.)
admn@bharatoil.com
Digitally Signed By:Surinder K Kukreja
Date: 2022-12-22 09:50:33
Click here to E-verify

Authorized Signatory

Sales Office :
11, Community Centre, LGF, East of Kailash
New Delhi - 110 065, India

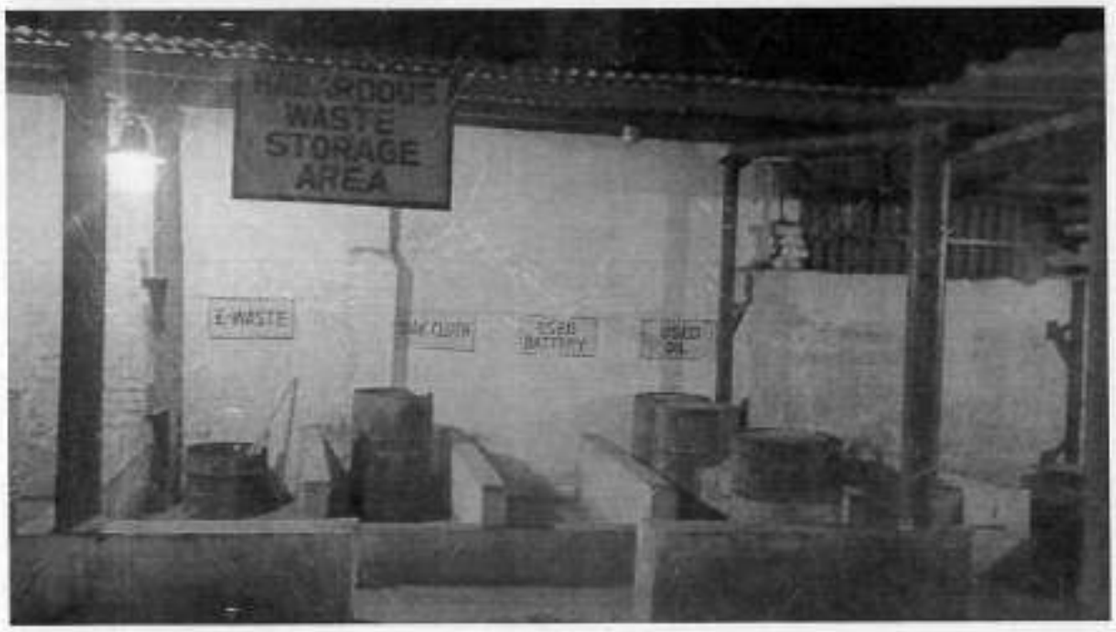
Regd. Office :
11 LGF, Community Center, East of Kailash, New Delhi-110065, India
Ph : 41000710, 26210295 Telefax : 26216466

Email : sales@bharatoil.com www.bharatoil.com

Facilities :
- E - 18, Sahibabad Industrial Area, Site 4 Ghaziabad - 201 010 (UP) India
- Gata No. 672, Vill. Kumbhi, NH - 2 Ramabai Nagar - 209 101 (U.P.)
- Mauza Mukimpur Roorkee-Lakshar Road Roorkee - 247664 (UK)
- SIDCUL - Haridwar (UK)

Annexure – 2


HAZARDOUS
WASTE
STORAGE
AREA
E-WASTE


WASTE
STORAGE
AREA
E-WASTE

bajaj ENERGY

ANNEXURE-R-5

(Colly)

Ref: - BEL/Dir/EHS/2022-23/

Dated: 27/02/2023

To,
The Chief Environmental Officer (Circle-6)
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others for M/s Bajaj Energy Ltd.,Barkhera, Dist.Pilibhit

Ref: Your letter no H88874/C-7/604/O.A.-691/2022/23 dated 10.02.2023

Dear Sir,

With reference to above mention letter received on 20.02.2023, the point wise compliance status is as under:

Sl.	Observations	Compliance Status
1.	The unit has to installed easy / spiral ladder for the monitoring of flue gas emission as per CPCB guideline.	An undertaking has already been submitted in this regard to the Hon'ble NGT Committee on 04.02.2023. The copy of submitted undertaking is enclosed as **Annexure-1.** As per the submitted affidavit, erection and commission of the ladder is expected to be completed by 30.09.2023.
2.	No information has been provided as to how thermal power stations are laying closed as per common understanding, such plants are never closed completely. State PCB may checkup this aspect.	Bajaj Energy Power Plants operate as per the Schedule issued by the UP State Load Dispatch Centre (UPSLDC). UPSLDC keeps on instructing BEL to operate / shutdown Power Plant as per the load demand of Uttar Pradesh. It is to mention that Barkhera Station was under reserved shutdown from 27.01.2023 to 14.02.2023 due to low demand in the State of Uttar Pradesh.

डाक प्राप्ति रसीद
प्राप्ति दिनांक..6/3/2023..
प्राप्तकर्ता के हस्ताक्षर.....
उ०प्र० प्रदूषण नि...

Bajaj Energy Ltd
ISO 9001, ISO 14001 & OHSAS 18001 Certified
Unit: Surla Machwapur Nanta Urf Muradabad, Post Barkhera, Tehsil Bisalpur, Dist.Pilibhit 262 202, Uttar Pradesh Tel.: +91 5881 226811
Registered Office: Khambarkhera, Shantanagar Road, Lakhimpur Kheri - 262 804, Uttar Pradesh
Tel: +91 5872 220004 Fax: +91 5872 220034
CIN: U40102UP2008PLC044764 | Web : www.bajajenergy.com

bajaj GROUP THINK TOMORROW

Scanned with OKEN Scanner

We once again assure you that, we are sincere to our environment, conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing facility and will always remain so.

Thanking you

Yours Faithfully

For Bajaj Energy Ltd.,
Unit: Barkhera

(Authorized signatory)

Encl: As Above

CC To:

1. The District Magistrate, Dist Pilibhit
2. The Regional Officer, Uttar Pradesh Pollution Control Board, Bareilly

Scanned with OKEN Scanner

bajaj ENERGY

Ref. No. BEL/BRK/NGT/02-2023 February 06, 2023

LETTER OF UNDERTAKING

To,
The Regional Director- Central Region
Central Pollution Control Board,
Vibhuti Khand, Gomti Nagar, Lucknow- 226020

Sir,

With reference to the Hon'ble NGT matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we undertake as follows:

1. In order to further strengthen the safety during the stack environmental monitoring, process for the installation of spiral ladder at our boiler stack has already been started,
2. The enquiry has been floated to different expert vendors and offer received till date is enclosed here with as Annexure-1,
3. Placement of order and erection and commission of the ladder is expected to be completed by 30-Sept-23.

Thanking you,

Yours faithfully,

For Bajaj Energy Ltd.
Unit: Barkhera, Pilibhit (UP)

(Authorized Signatory)

Encl.: As above

Copy to: Regional Officer – UP Pollution Control Board

Bajaj Energy Ltd
ISO 9001, ISO 14001 & OHSAS 18001 Certified
Unit: Gurla Madhavpur, Nakte Urf Murtadabad, Post Barkhera, Tehsil Bisalpur, Dist Pilibhit 262 203, Uttar Pradesh Tel: +91 5801 220811
Registered Office: Khambarkhera, Shardanagar Road, Lakhimpur Kheri – 261 504, Uttar Pradesh
Tel: +91 5872 220006 Fax: +91 5872 220934
CIN: U40100UP2008PLC046764 | Web : www.bajajenergy.com

bajaj GROUP
THINK TOMORROW

Estimate

R V INDUSTRIES

4/36 DHAMNI VILLAGE OPP KAUTILYA LEADERSHIP SERVICES, TALUKA - KHALAPUR DIST. RAIGAD -410203. CONSTRUCTION SCAFFOLDING & EQUIPMENTS SALESH & SERVICE FABRICTORS & ALUMINUM FACHADE WORKS.

Phone no.: 8655577277 - 9892227121 Email: rvindustries2219@gmail.com

GSTIN: 27BBNPD1916R1Z6, State: 27-Maherashtra

Estimate For:

UNIT HEAD 90MW BAJAJ ENERGY LTD POWER PLANT

BARKHERIA PILIBHIT UP

Place of Supply: 09-Uttar Pradesh

Estimate No.: Q/22/22-00025

Date: 25-01-2023

Time: 06:34 PM

#	Item name	HSN/ SAC	Count	Size	Quantity	Unit	Price/ Unit	GST	Amount
1	SPIRAL STAIRCASE (MATERIAL DESCRIPTION ◆INNER VERTICAL PIPE 150 DIE 6 MM THICKNESS ◆OUTER PIPE 225 MM STEPS JOINT 170 MM DIE 5 MM THICKNESS ◆STEP MATERIAL USE 5 MM CHAKKAR PLATE &40X40X5 MM ANGLE & 40X6 MM FLATE ◆RELLING VARTICAL 20X20 MM SQUARE BAR 1 MTRS HIGHT & RDAUND TOP 50X6 MM FLATE ◆PAINT ONE COUT PRIMER & 2 COUT PU PAINTS)	7308	1	30 MTR HEIGHT	30	MTR	₹ 27,500.0	₹ 1,48,500.0 (18.0%)	₹ 9,73,500.0
2	REMOVED & INSTALLATION		1	2.0 MTR DIE 30 MTRS. HEIGHT	30	MTR	₹ 6,000.0	₹ 32,400.0 (18.0%)	₹ 2,12,400.0
	Total		2		60			₹ 1,80,900.0	₹ 11,85,900.0

Tax type	Taxable amount	Rate	Tax amount
IGST	₹ 10,05,000.0	18.0%	₹ 1,80,900.0

Amounts:	
Sub Total	₹ 11,85,900.0
Total	**₹ 11,85,900.0**

Estimate order Amount in Words

Eleven Lakh Eighty Five Thousand Nine Hundred Rupees only

Description:

1. 70% Advanced before starting the work.
2. 30% After completing 30% of the work.
3. Any type of legal work will be in client scop

Terms and conditions:

Thanks for doing business with us!

Bank details:

Bank Name: Kotak Mahindra Bank Limited, Mumbai Kurla West Bra

Bank Account No.: 9013301487

Bank IFSC code: KKBK0001381

Account Holder's Name: R V INDUSTRIES

For, R V INDUSTRIES

Authorized Signatory

bajaj ENERGY

Ref: - BEL/Dir/EHS/2022-23/ 01 **Dated:27/02/2023**

To,
The Chief Environmental Officer (Circle-6)
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others for M/s Bajaj Energy Ltd., Kundarkhi, Dist. Gonda (UP)

Ref: Your letter no 88906 dated 10.02.2023

Dear Sir,

With reference to above mention letter received on 21.02.2023 , the point wise compliance status is as under:

Sl.	Observations	Compliance Status
1.	The unit has to installed easy / spiral ladder for the monitoring of flue gas emission as per CPCB guideline.	An undertaking has already been submitted in this regard to the Hon'ble NGT Committee on 06.02.2023. The copy of submitted undertaking is enclosed as **Annexure-1**. As per the submitted affidavit, erection and commission of the ladder is expected to be completed by 30.09.2023.

We once again assure you that, we are sincere to our environment, conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing facility and will always remain so.

Thanking you

Yours Faithfully

For Bajaj Energy Ltd.,
Unit: Kundarkhi

(Authorized signatory)

डाक प्राप्ति रसीद
प्राप्ति दिनांक 6/3/2023
प्राप्तकर्ता के ह
उ0प्र0 प्रदूषण

Encl: As Above

CC To:
1. The District Magistrate, Dist.Gonda
2. Uttar Pradesh Pollution Control Board,

Bajaj Energy Limited
Tel. +91-5672-220006 Fax: +91-5672-220036

bajaj GROUP THINK TOMORROW

Annexure-1

bajaj ENERGY

Ref. No. BE/KDS/NGT/02-2023 February 06, 2023

LETTER OF UNDERTAKING

To,
The Regional Director- Central Region
Central Pollution Control Board,
Vibhuti Khand, Gomti Nagar, Lucknow- 226020

Sir,

With reference to the Hon'ble NGT matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we undertake as follows:

1. In order to further strengthen the safety during the stack environmental monitoring, process for the installation of spiral ladder at our boiler stack has already been started.
2. The enquiry has been floated to different expert vendors and offer received till date is enclosed here with as Annexure-1,
3. Placement of order and erection and commission of the ladder is expected to be completed by 30-Sept-23.

Thanking you,

Yours faithfully,

For Bajaj Energy Ltd.
Unit: Kundarkhi, Gonda (UP)

06/2/23

(Authorized Signatory)

Encl.: As above

Copy to: Regional Officer – UP Pollution Control Board

bajaj ENERGY

Ref: - BEL/Dir/EHS/2022-23/

Dated: 03/03/2023

To,
The Chief Environmental Officer (Circle-7)
Uttar Pradesh Pollution Control Board
TC-12V, VibhutiKhand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others for M/s Bajaj Energy Ltd., Maqsoodapur, Dist. Shahjahanpur, U.P.

Ref: Your letter no. H-88873/C-7/604/OA-691/2022/23 dated 10/02/2023.

Dear Sir,

With reference to above mention letter received on 18.02.2023, the point wise compliance status is as under:

Sl.	Observations	Compliance Status
1.	The unit has to installed easy/ spiralladder for the monitoring of flue gas emission as per CPCB guideline.	An undertaking has already been submitted in this regard to the Hon'ble NGTCommittee on 04.02.2023. The copy of submitted undertaking is enclosed as **Annexure-1**. As per the submitted affidavit, erection and commission of the ladder is expected to be completed by 30.09.2023.
2.	No information has been provided as to how thermalpower stations are laying closed as per common understanding, suchplants are never closed completely. State PCB may checkup this aspect.	Bajaj Energy Power Plants operate as per the Schedule issued by the UP State Load Dispatch Centre (UPSLDC). UPSLDC keeps on instructing BEL to operate / shutdown Power Plant as per the load demand of Uttar Pradesh. It is to mention that Maqsoodapur Station was under reserved shutdown from 05.10.2022 to 28.12.2022 due to low demand in the State of Uttar Pradesh.

डाक प्राप्ति रसीद
प्राप्ति दिनांक 6.3.2023
प्राप्तकर्ता के हस्ताक्षर
उ०प्र० प्रदूषण नियंत्रण बोर्ड

Bajaj Energy Limited
ISO 9001, ISO 14001 & OHSAS 18001 Certified
Unit: Maqsoodpur, Powayan, Shahjahanpur, Bareilly - 242 042, Uttar Pradesh
Registered Office: Khamberkhera, Shantinagar Road, Lakhimpur Kheri - 261 504, Uttar Pradesh
Tel: +91-5872-220000, Fax: +91-5872-220034
CIN: U40100UP2008PLC034744, Web: www.bajajenergy.com

bajaj GROUP THINK TOMORROW

We once again assure you that, we are sincere to our environment, conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing facility and will always remain so.

Thanking you

Yours Faithfully

For Bajaj Energy Ltd.,
Unit: Maqsoodapur

For Bajaj Energy Ltd.
Maqsoodapur
Authorised Signatory

(Authorized signatory)
Encl: As Above

Bajaj Energy Limited
PIN Code 242042
Maqsoodapur (U.P.)

CC To:

1. The Regional Officer, Uttar Pradesh Pollution Control Board, Rajendra Nagar, Bareilly 243122.

bajaj SUGAR

Ref. No. BHSL/MQR/NGT/03-2023

January 31, 2023

LETTER OF UNDERTAKING

To,
The Regional Director- Central Region
Central Pollution Control Board,
PICUP Bhawan, VibhutiKhand, Gomti Nagar, Lucknow- 226010

Sir,

With reference to the Hon'ble NGT matter of Original application no. 691/2022 Rama Shankar AwasthiVs. State of UP & Others, we undertake as follows:

1. In order to further strengthen the safety during the stack environmental monitoring, process for the installation of spiral ladder at our boiler stack has already been started,
2. The enquiry has been floated to different expert vendors and offer received till date is enclosed here with as Annexure-1,
3. Placement of order and erection and commission of the ladder is expected to be completed by 30-Sept-23.

Thanking you,

Yours faithfully,

For Bajaj Hindusthan Sugar Limited.
Unit: Maqsoodapur, Shahjahanpur (UP)

(Authorized Signatory)

Encl.: As above
Copy to:

1. Chief Environmental Officer Circle-7 UP Pollution Control Board Lucknow
2. Regional Officer – UP Pollution Control Board Bareilly

Bajaj Hindusthan Sugar Ltd.
Unit : Maqsoodapur (Banda- Bilsanda Road), Tehsil: Powayan, Distt. Shahjahanpur- 242042 (U.P.)
Regd. Office : Golagokarannath, Lakhimpur-Kheri, District Kheri,Uttar Pradesh - 262802
Tel.: +91-5876-233754/5/7/8, 233400 | Fax: +91-5876-233481
E-mail : investorcomplaints@bajajhindusthan.com | Website : www.bajajhindusthan.com | CIN: L15420UP1933PLC065263

bajaj GROUP THINK TOMORROW

Estimate

R V INDUSTRIES

A/3B DHAMNI VILLAGE, OPP KAUTILYA LEADERSHIP SERVICES, TALUKA - KHALAPUR DIST RAIGAD -410203, CONSTRUCTION SCAFFOLDING & EQUIPMENTS SALESH & SERVICE FABRICTORS & ALUMINUM FACHADE WORKS

Phone no.: 8655577277 - 9892227121 Email: rvindustries2210@gmail.com

GSTIN: 27B6NPD1916R1Z6, State: 27-Maharashtra

Estimate For:

BAJAJ HINDUSTAN SUGAR LTD.

KHAMBHARKHERA KHERI LAKHIPUR UP.

Contact No.: +91 94566 94092

Estimate No.: Q/22/22-00027

Date: 25-01-2023

Time: 07:05 PM

#	Item name	HSN/ SAC	Count	Size	Quantity	Unit	Price/ Unit	GST	Amount
1	SPIRAL STAIRCASE (MATERIAL DESCRIPTION ◆INNER VERTICAL PIPE 150 DIE 6 MM THICKNESS ◆OUTER PIPE 225 MM STEPS JOINT 170 MM DIE 5 MM THICKNESS ◆STEP MATERIAL USE 5 MM CHAKKAR PLATE &40X40X5 MM ANGLE & 40X6 MM FLATE ◆RELLING VARTICAL 20X20 MM SQUARE BAR 1 MTRS HIGHT & ROAUND TOP 50X6 MM FLATE ◆PAINT ONE COUT PRIMER & 2 COUT PU PAINTS)	7308	1	30 MTR HEIGHT	45	MTR	₹ 27,500.0	₹ 2,22,750.0 (18.0%)	₹ 14,60,250.0
2	REMOVED & INSTALLATION		1	2.0 MTR DIE 30 MTRS. HEIGHT	45	MTR	₹ 6,000.0	₹ 48,600.0 (18.0%)	₹ 3,18,600.0
	Total		2		90			₹ 2,71,350.0	₹ 17,78,850.0

Tax type	Taxable amount	Rate	Tax amount
IGST	₹ 15,07,500.0	18.0%	₹ 2,71,350.0

Amounts:	
Sub Total	₹ 17,78,850.0
Total	₹ 17,78,850.0

Estimate order Amount In Words

Seventeen Lakh Seventy Eight Thousand Eight Hundred and Fifty Rupees only

Description:

1.70% Advanced before starting the work.
2.30% After completing 30% of the work.
3. Any type of legal work will be in client scop

Terms and conditions:

Thanks for doing business with us!

Bank details:

Bank Name: Kotak Mahindra Bank Limited, Mumbai Kurla West Bra

Bank Account No.: 9013301487

Bank IFSC code: KKBK0001381

Account Holder's Name: R V INDUSTRIES

For, R V INDUSTRIES

Authorized Signatory

bajaj ENERGY

Ref: - BEL/Dir/EHS/2022-23/

Dated: 27/02/2023

To,
The Chief Environmental Officer (Circle-6)
Uttar Pradesh Pollution Control Board
TC-12V, Vibhuti Khand, Gomti Nagar
Lucknow-226010

Sub: Recommendations made by the Joint Committee of Hon'ble NGT in the matter of OA no. 691/2022 Rama Shankar Awasthi Vs. State of UP and Others for M/s Bajaj Energy Ltd., Utraula, Dist. Balrampur

Ref: Your letter no H88910/C-6/61/BASTI/2023 dated 10.02.2023

Dear Sir,

With reference to above mention letter received on 20.02.2023 the point wise compliance status is as under:

Sl.	Observations	Compliance Status
1.	The unit has to installed easy / spiral ladder for the monitoring of flue gas emission as per CPCB guideline.	An undertaking has already been submitted in this regard to the Hon'ble NGT Committee on 04.02.2023. The copy of submitted undertaking is enclosed as **Annexure-1**. As per the submitted affidavit, erection and commission of the ladder is expected to be completed by 30.09.2023.
2.	No information has been provided as to how thermal power stations are laying closed as per common understanding, such plants are never closed completely. State PCB may checkup this aspect.	Bajaj Energy Power Plants operate as per the Schedule issued by the UP State Load Dispatch Centre (UPSLDC). UPSLDC keeps on instructing BEL to operate / shutdown Power Plant as per the load demand of Uttar Pradesh. It is to mention that Utraula Station was under reserved shutdown from 05.10.2022 to 15.02.2023 due to low demand in the State of Uttar Pradesh.

डाक प्राप्ति रसीद
प्राप्ति दिनांक 6/3/2023
प्राप्तकर्ता के हस्ताक्षर
उ०प्र० प्रदूषण नियंत्रण

Bajaj Energy Ltd
(ISO 9001, ISO 14001 & OHSAS 18001 Certified)
Regional Office: TC-13, Vibhuti Khand, Gomti Nagar, Lucknow - 226 010
Tel: +91 522 2720852, 2728672, 2721837 Fax: +91 522 2728642
Registered Office: Khambarkhera, Shardanagar Road, Lakhimpur Kheri - 261 504, Uttar Pradesh
Tel: +91 5872 220004 | Fax: +91 5872 220004 | CIN: U40102UP2008PLC046764 | Web : www.bajajenergy.com

bajaj GROUP THINK TOMORROW

We once again assure you that, we are sincere to our environment, conscious of our social responsibilities and are committed towards creating a clean and safe environment in and around our manufacturing facility and will always remain so.

Thanking you

Yours Faithfully

For Bajaj Energy Ltd.,
Unit: Utraula

27/02/2023

(Authorized signatory)

Encl: As Above

CC To:

1. The District Magistrate, Dist. Balrampur
2. The Regional Officer, Uttar Pradesh Pollution Control Board, Basti

bajaj ENERGY

Ref: NSP-BEL/UTR/NGT/02-2023 February 06, 2023

LETTER OF UNDERTAKING

To,
The Regional Director- Central Region
Central Pollution Control Board,
Vibhuti Khand, Gomti Nagar, Lucknow- 226020

Sir,

With reference to the Hon'ble NGT matter of Original application no. 691/2022 Rama Shankar Awasthi Vs. State of UP & Others, we undertake as follows:

1. In order to further strengthen the safety during the stack environmental monitoring, process for the installation of spiral ladder at our boiler stack has already been started,
2. The enquiry has been floated to different expert vendors and offer received till date is enclosed here with as Annexure-1,
3. Placement of order and erection and commission of the ladder is expected to be completed by 30-Sept-23.

Thanking you,

Yours faithfully,

For Bajaj Energy Ltd.
Unit: Utraula, Balrampur (UP)

(Authorized Signatory)

Encl.: As above

Copy to: Regional Officer – UP Pollution Control Board

Bajaj Energy Limited
ISO 9001, ISO 14001 & OHSAS 18001 Certified
Unit: Nai Mandi,Utraula, Balrampur, Sri Dattganj-271 607, Uttar Pradesh
Registered Office: Khambarkhera, Sheetalganj Road, Lakhimpur Kheri - 261 506, Uttar Pradesh
Tel: +91-5872-220006 Fax: +91-5872-220034
CIN: U40102UP2008PLC044764 | Web: www.bajajenergy.com

bajaj GROUP THINK TOMORROW

Estimate

R V INDUSTRIES

4/36 DHAMNI VILLAGE, OPP KAUTILYA LEADERSHIP SERVICES, TALUKA - KHALAPUR DIST. RAIGAD -410203. CONSTRUCTION SCAFFOLDING & EQUIPMENTS SALESH & SERVICE FABRICTORS & ALUMINUM FACHADE WORKS

Phone no.: 8655577277 - 9892227121 Email: rvindustries2219@gmail.com

GSTIN: 27BBNPD1916R1Z6, State: 27-Maharashtra

Estimate For:

UNIT HEAD 90MW BAJAJ ENERGY LTD POWER PLANT

UTRAULA BALRAMPUR UP.

Place of Supply: 09-Uttar Pradesh
Estimate No.: Q/22/23-00026
Date: 25-01-2023
Time: 06:35 PM

#	Item name	HSN/ SAC	Count	Size	Quantity	Unit	Price/ Unit	GST	Amount
1	SPIRAL STAIRCASE (MATERIAL DESCRIPTION ◆INNER VERTICAL PIPE 150 DIE 6 MM THICKNESS ◆OUTER PIPE 225 MM STEPS JOINT 170 MM DIE 5 MM THICKNESS ◆STEP MATERIAL USE 5 MM CHAKKAR PLATE &40X40X5 MM ANGLE & 40X6 MM FLATE ◆RELLING VARTICAL 20X20 MM SQUARE BAR 1 MTRS HIGHT & ROAUND TOP 50X6 MM FLATE ◆PAINT ONE COUT PRIMER & 2 COUT PU PAINTS)	7308	1	30 MTR HEIGHT	30	MTR	₹ 27,500.0	₹ 1,48,500.0 (18.0%)	₹ 9,73,500.0
2	REMOVED & INSTALLATION		1	2.0 MTR DIE 30 MTRS. HEIGHT	30	MTR	₹ 6,000.0	₹ 32,400.0 (18.0%)	₹ 2,12,400.0
	Total		**2**		**60**			**₹ 1,80,900.0**	**₹ 11,85,900.0**

Tax type	Taxable amount	Rate	Tax amount
IGST	₹ 10,05,000.0	18.0%	₹ 1,80,900.0

Amounts:	
Sub Total	₹ 11,85,900.0
Total	**₹ 11,85,900.0**

Estimate order Amount in Words

Eleven Lakh Eighty Five Thousand Nine Hundred Rupees only

Description:

1. 70% Advanced before starting the work.
2. 30% After completing 30% of the work.
3. Any type of legal work will be in client scop

Terms and conditions:

Thanks for doing business with us!

Bank details:

Bank Name: Kotak Mahindra Bank Limited, Mumbai Kurla West Bra

Bank Account No.: 9013301487

Bank IFSC code: KKBK0001381

Account Holder's Name: R V INDUSTRIES

For, R V INDUSTRIES

Authorized Signatory

ANNEXURE-R-6 (COLLY)

Confidential

Report

on

Water Audit Study

at

Bajaj Energy Limited

(Barkhera Unit)

Submitted to

Bajaj Energy Limited

Barkhera Unit

Pilibhit-Bisalpur Road, Distt. Pilibhit

Uttar Pradesh – 262 203.

Submitted By

National Productivity Council,

Utpadakta Bhavan, 5-6, Institutional Area,
Lodhi Road, New Delhi 110003.

PH: 011 2469 0331, 2460 7311; Email: emgroup.hq@npcindia.gov.in,
Website: www.npcindia.gov.in

(August 2020)

Acknowledgement

National Productivity Council (NPC), Delhi wishes to place on record its deep gratitude to the progressive management of Bajaj Energy Limited (BEL) for vesting its confidence in the services of National Productivity Council (NPC) to conduct Water Audit Study at its five Power plants located at different locations across the state of Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur).

The study team is especially thankful and appreciative of the keen interest and commitment of ***Mr. Vinay Kumar Singh Bankoti, Managing Director (MD), Dr. A. V. Singh, Chief Sustainability Officer, Mr. Narender Wadhwa, Vice President, Mr. Santosh Kumar Shrivastava, Asst. General Manager (AGM) and Mr. T S Shekhawat Asst. Manager*** for the study.

Our special thanks are due to ***Mr. A K Mehta, Vice President*** for their valuable guidance and encouragement throughout the study.

The study team is thankful to ***Mr. Deepak Rana, Operation head and Mr Mohammad Nadeem Khan, O&E head,*** for their valuable support and coordination during the conduct of the study. Our thanks are also due to following plant officials for their help and co-operation extended to the NPC study team during field study period:
Mr. Ashok Pal, Chemical head
Mr. Prasant Gautam, EHS head,

We are thankful to all the executives, non-executives and other staff, who have rendered co-operation and assistance to NPC team during the entire period of the Audit at (BEL), Barkhera.

National Productivity Council

Water Audit Team

Study Team

1. Sh. Prashant Srivastava (Deputy Director & Head)
2. Sh. Anand Verma (Deputy Director)
3. Sh. Jitendra Kumar Srivastava (Assistant Director)
4. Sh. Jatin Saini (Assistant Director)
5. Sh. Goutam Saha (Consultant)
6. Sh. Aniruddha Neogi (Project Engineer)



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Executive Summary

As part of on-going efforts to reduce Water Consumption, the progressive management of Bajaj Energy Limited approached NPC to carry out the Water Balance study of its 5 plants in Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur). The study is intended to be a Detailed Water audit study of the above Plants regarding their existing operating status of water use and suggesting relevant water conservation measures to be adopted to bring down the water consumption in the plant.

As a result, NPC team has carried out the field visit for water audit study at 5 Power Plants of Bajaj Energy Limited in July 2020. Available data pertaining to various key parameters were collected from the concerned officials. The necessary field measurements were carried out during the field study for assessing the existing water use scenario and to identify the water conservation measures. The report has been prepared for Barkhera Plant based on the data/information collected/measurement taken by the NPC team and observations made during the field study are discussed in this report.

The following recommendations and findings made as per the observation of the study team:

Water Usage Scenario

The source of water is from two numbers of borewell pump installed in the plant.

Specific water consumption is established on the basis of historical data collected from the plant and the same is tabulated below:

Table 1: Specific Water Consumption

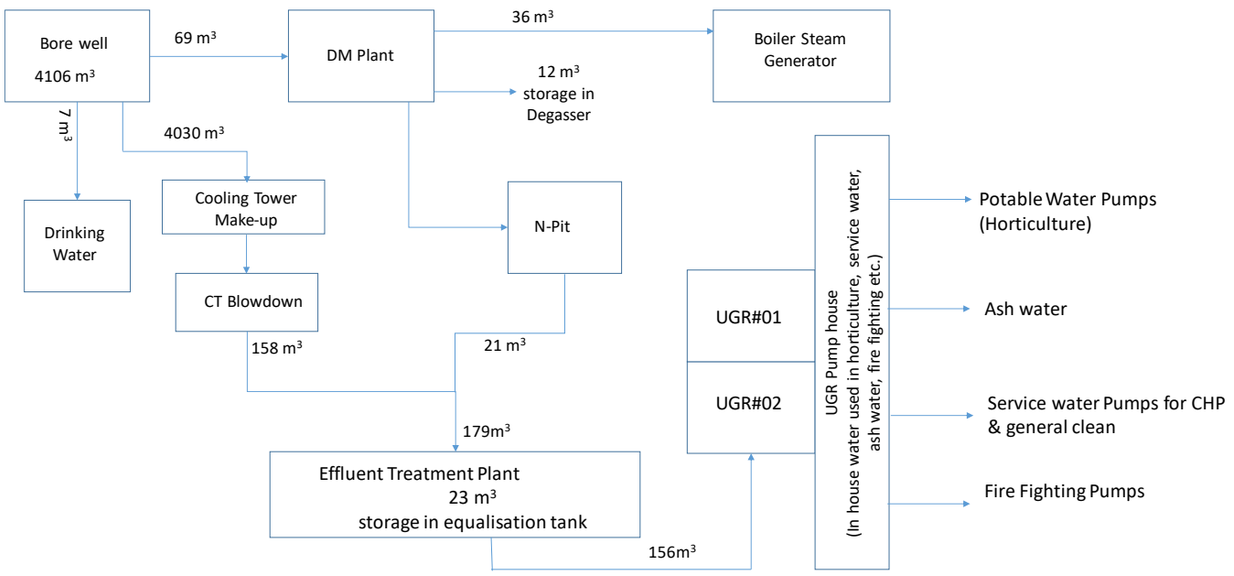
Considering, total Specific water consumption (Plant running + Plant shutdown period):

Particulars	Unit	Value	Standard
Generation of 2 units (@45MW)*(July 2019 to June 2020)*	MU	65.244	• Standard Specific water consumption = 3.5 m^3/MWh.(as per MOEF notification dated 7th Dec'15)
Water consumption *((July 2019 to June 2020)*	m^3	197838	
Specific water consumption (m^3/MWh)	m^3/MWh	3.03	

**Period: July 2019 to June 2020.*

** Standard values for close loop circuil system.*

Actual measurement of Total water distribution on particular day at different usage areas are illustrated in the diagram below:


Bore well
4106 m³
69 m³
DM Plant
36 m³
Boiler Steam Generator
12 m³ storage in Degasser
7 m³
4030 m³
Drinking Water
Cooling Tower Make-up
N-Pit
CT Blowdown
158 m³
21 m³
179m³
Effluent Treatment Plant
23 m³
storage in equalisation tank
156m³
UGR#01
UGR#02
UGR Pump house
(In house water used in horticulture, service water, ash water, fire fighting etc.)
Potable Water Pumps (Horticulture)
Ash water
Service water Pumps for CHP & general clean
Fire Fighting Pumps

Water Consumption & Water Balancing

Water consumption at different sections of the plant is given below.

Table 2: Overall Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	171.08	4106	
2	**Total Outflow**			
2.1	DM plant inlet	2.87	69	MGF feed pump use for DM plant inlet and Drinking water.
2.2	Drinking water	0.3	7	
2.3	CT make-up {1.1 - (2.1+2.2)}	167.93	4030	
	Total outflow	171.08	4106	

Table 3: Bore well water pumps to DM Plant

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (at near CT)	163	17.00	1	115	2771		
2	Bore well Pump - 2 (at near shop)	150	9	1	56	1335		
1	Total Inflow of Raw water Make-up (1+2).				171	4106		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	16	4.4	1	2.9	68.9		
	Inflow of DM plant				2.9	69		.
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	13	2.8	1	1.5	36		
2.2	N-pit Pump	98	0.2	1	0.9	21		
2.3	Degasser					12		
2.1.1	DM Transfer Pump - 1	39	1.0	1	1.6	39		VFD Operated

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Outflow of DM plant (2.1+2.2+2.3)				2.84	68.33		
	Difference				0.02	0.59		Unaccounted

Table 4: Effluent Treatment Plant (ETP) and Underground reservoir (UGR)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT Blowdown + 'N' pit)	83	2.15	1	7.4	178		
1.2	CT Blowdown					158		
	Inflow of ETP				7.4	178		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter Feed Pump)	39	4.0	1	6.5	156		
	Outflow of ETP				6.5	156		
	Difference (storage in equitation tank)				0.94	22.44		Storage in equitation tank
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				6.5	156		
	Inflow of UGR				6.5	156		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Use to ash water, horticulture and service water					156		
	Outflow of UGR					156		

Summary of Recommendations

Water Balance Study by NPC at (BEL), Barkhera plant has identified saving potential of **0.135MU/Year** Energy and **INR4.39Lakhs/year** of monetary savings. It is suggested that Barkhera plant may prioritise below mentioned Water& Energy conservation measures and commence implementation at the earliest. It is the responsibility of the plant personnel to confirm with safety and other statutory requirements before implementing the proposed water and energy conservation measures.

Summary of Water and Energy Conservation measures identified atBarkheraplant is shown below:

Table 5: Summary of Water and Energy Conservation measures

Sr. No	Particulars	Annual savings potential		Investment (INR in Lakhs)	Simple payback period (Yrs.)
		Energy	Monitory		
		MU/yr.	INR in Lakhs		
1	Pump Efficiency Improved by Overhauling of CW pumps and operating near design flow & head after proper designing the pump discharge pipe layout for equal flow at full load condition.	0.135	4.39	10.00	2.3
	TOTAL	**0.135**	**4.39**	**10.00**	**2.3**

General Observations and Recommendations:

- Install RO plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.
- Replacement of Underperforming "N" pit pump and Filter feed pump (ETP) by Energy Efficient Pumps & Motors with VFD drive.
- Replacement of Underperforming Bore well pumps (pumps + motors) by Energy Efficient Pumps & Motors with VFD drive.
- Filter backwash water and "N" pit water are recommended to use for ash water.
- Water leakage from air release valve (ARV) of Unit#1 LHS condenser outlet.
- Water Loss may occur due to leakage in long distance piping path from N-Pit to ETP (around 1 km distance from DM plant to ETP and water loss around 10 m^3/hr.).
- Dust suppression (DS) pumps are in operation during summer season only.
- Avoid overflow of water storage tanks by installing float-controlled valve at drinking water overhead storage tanks.

- Manage pressure in the system to ensure that optimal levels are maintained in the tank. High pressure causes wear and tear on the system causing new leaks and increasing loss rates.
- Repair installed meters at different areas or zones to monitor flow rates. Manage metered data by setting flow rate thresholds. When exceeded, it indicates possible system leaks.
- To carry out regular inspection of nozzles for clogging and leak and repair the detected leaks;
- Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow.
- Turning off all water flows during shutdowns unless they are essential for cleanup –To use solenoid valves to stop water flow when production stops (valves can be activated by connecting them to drive motor controls).
- Adjust pump cooling and water flushing to the minimum required level. Sharing of information with employees on water usage procedure and amount of water used for each application is recommended. This would promote how employee actions can reduce water usage.
- Place signs and placards near new equipment, making it easy to understand new technology and how to use it properly.

1 Introduction

1.1 Background

Water is one of the key input requirements for thermal power generation. Water is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.
Water is used in almost all areas/ facilities of thermal power stations in one way or other. A typical list of plant systems/ applications requiring consumptive water is indicated as below:

i) Cooling water system for condenser & plant auxiliaries
ii) Power cycle make up
iii) Equipment cooling system
iv) Air conditioning and ventilation system
v) Coal dust suppression system
vi) Service water system
vii) Potable water system
viii) Gardening
ix) Evaporation from raw water reservoir

Difficulties are already being faced in existing thermal power plants due to non-availability of water. This problem is expected to be aggravated in future when more sites would be required. Thus there is a need to minimize consumptive water requirement for thermal power plants. Optimization/ minimization of plant consumptive water includes measures such as judicious utilization of water in different applications, adoption of reduced margins in various consumptive uses, adequate treatment for deteriorating quality of raw water, use of plant waste waters in various low grade applications and recycling of plant waste waters to maximum extent.

Water audit is an important management tool for effective conservation of water. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one is consumption audit on demand side. Water audit in the plant is conducted to identify supplied water quantity, water usage, losses, water quality, identify and priorities areas which need immediate attention for control, raise awareness on monitoring water consumption and to provide suggestions for effective water conservation.

The broad area of scope of work includes performance assessment of raw water sources & existing storage systems, estimation of present water consumption, water balance across the entire system, assessment of water consumption per unit generation, water quality management plan, measures of improving efficiency of water utility networks and also to enhance operational efficiency through controls.

1.2 About the Project

BEL, as part of their energy efficiency and resource conservation endeavours, had initiated the process of Auditing of significant systems/subsystems on a regular basis, with a view of achieving resource consumption optimization and continuous improvement. As a part of it, the management of BEL approached National Productivity Council (NPC), Delhi, to conduct the "Water Audit Study of five of its plants located in the state of Uttar Pradesh. Onsite measurements for the above stated Water Audit Study was carried out during the month of July 2020.

This report provides details about the scope, methodology, measurements, water balance of individual subsystems and overall plant, findings and recommendations of the water balance study of Barkhera plant.

1.3 Objectives and Scope of the Study

The broad objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

The scope of the water audit study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
    - Raw water
    - DM water
    - Circulating water
    - Waste water

- To develop norms for in-house water consumption and use in terms of m^3/MWh for monitoring and targeting.
- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.
- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (whereever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:
  - ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.
  - ✓ Laboratory testing & analysis reports for key parameters.

1.4 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Barkhera plant.

- ➢ Direct measurement-Using Ultrasonic Flow meter for clear water
- ➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
- Electrical measurements were carried out by using 3 phase Power Analyser.
- Standard pressure gauges were used for monitoring suction &discharge pressures of pumps.

1.5 Instruments used

- Ultrasonic Water Flow Meter
- 3-phase power analyser

1.6 About Bajaj Energy Limited

Bajaj Energy limited (BEL) is one of the largest private sector thermal generation companies in Uttar Pradesh and is involved in developing, financing and operating thermal power plants in India. BEL has a total installed capacity of comprising 450 MW from five operational plants of 90 MW each owned and managed by Bajaj Energy Limited (BEL), spread across the state of Uttar Pradesh.

BEL has entered into long-term fuel supply agreements with Central Coal Fields Limited & Northern Coal Field, subsidiaries of Coal India Limited & Northern Coal Field, for the supply of coal to the BEL Power Plants. The BEL Power Plants have been fully operational since 2012 and possess an operational track record of more than eight years.

1.7 About National Productivity Council (NPC)

National Productivity Council, an autonomous body under the Ministry of Industry, Government of India, was established in the year 1958, to promote productivity culture in the country. It is a tri-partite, non-profit making organization, with equal representation from the government, employers and workers organizations, apart from technical and professional institutions and other interests on its governing council. NPC, as an apex body, provides consultancy and training in various fields including Energy Management, over the past five decades and undertakes research in the areas of productivity. NPC has 12 regional offices in India and a total strength of about 135 professionals/consultants. NPC with its regional offices located in major cities / industrial cities has unique advantages in carrying out multi location assignments and assignments on all India basis.

Energy Management group of NPC has a total strength of around 30 fulltime EM professional out of which around 18 are certified Energy Auditors and about 10 are accredited energy auditors from Bureau of Energy Efficiency. NPC provides consultancy as well as capacity building services to several international, national as well as unit level clients. EM Group offers consulting services in

various sectors including industry, power generation, distribution, commercial, agriculture and SME clusters.

1.8 About the Plant

The total installed capacity of BEL, Barkhera plant is 90 MW (2x45MW).

The major performance parameters of the Plant for a representative day during 3rdJuly 2020 are:

Table 6: Performance parameters of the Plant

Parameters	Units	Unit 1 (45MW)	Unit 2 (45MW)	Station
Loading at 84%				
Avg. Generation	MW	37.97	37.97	75.94
Avg. daily Steam (Boiler)	TPD	3675	3681	7356
	TPH	153	153	307
DM Make-up	TPD	12.50	12.50	25.00
DM Make-up	TPH	0.521	0.521	1.04
% of DM Make-up	%	0.34%	0.34%	0.34%

1.9 Scope and Objectives of the Study

The scope of the water balance study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
    - Raw water
    - DM water
    - Circulating water
    - Waste water
- To develop norms for in-house water consumption and use in terms of m^3/MWh for monitoring and targeting.
- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.

- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (where-ever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:
  - ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.
  - ✓ Laboratory testing & analysis reports for key parameters.

The objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

1.10 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Barkhera plant.

- ➢ Direct measurement-Using Ultrasonic Flow meter for clear water
- ➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
  - Electrical measurements were carried out by using 3 phase Power Analyser.
  - Standard pressure gauges were used for monitoring suction &discharge pressures of pumps.

2 Existing System

2.1 Installed Capacity

BEL, Barkhera plant has an installed capacity of 90 MW as per the details given below:

2 x 45 MW	=	**90 MW**
Total	=	**90 MW**

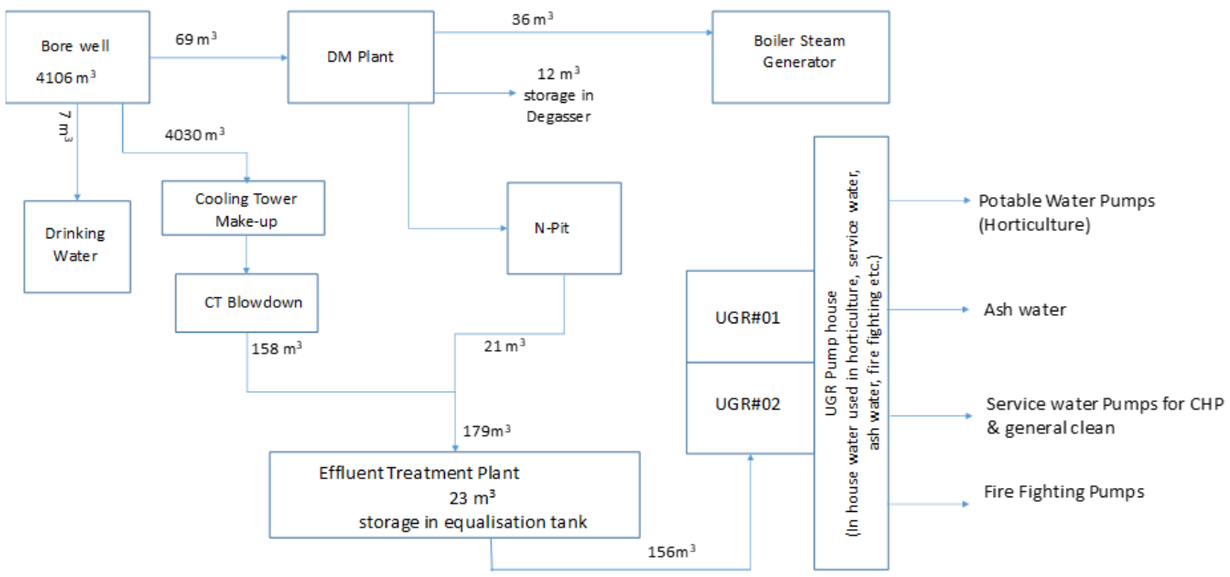
The following section describes the specifications of equipment related to various water systems in the plant.

2.2 Overall Water Balance Summary of the plant

Table 7: Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	171.08	4106	
2	**Total Outflow**			
2.1	DM plant inlet	2.87	69	MGF feed pump use for DM plant inlet and Drinking water.
2.2	Drinking water	0.3	7	
2.3	CT make-up {1.1 - (2.1+2.2)}	167.93	4030	
	Total outflow	171.08	4106	

2.3 Overall Water Balance Diagram of the plant on particular day



2.4 Bore well water and DM Plant

Barkhera plant draws raw water from underground water by two bore well pumps, then it is pumped to DM plant for DM water generation, potable water for drinking water and cooling water make-up.

Table 8: Water Consumption and Balancing (DM Plant)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (at near CT)	163	17.00	1	115	2771		
2	Bore well Pump - 2 (at near shop)	150	9	1	56	1335		
3	Total Inflow of Raw water Make-up (1+2).				171	4106		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	16	4.4	1	2.9	68.9		
	Inflow of DM plant				2.9	69		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	13	2.8	1	1.5	36		
2.2	N-pit Pump	98	0.2	1	0.9	21		
2.3	Degasser					12		
2.1.1	DM Transfer Pump - 1	39	1.0	1	1.6	39		VFD Operated
	Outflow of DM plant (2.1+2.2+2.3)				2.84	68.33		
	Difference				0.02	0.59		Unaccounted

Table 9: Assessment of Water Pumps Performance

Particulars	Unit	Bore well Pump - 1 (Near CT)	Bore well Pump - 2 (Near Storage)	N-Pit Pump
		Pump	Pump	Pump
Design Details				
Motor				
Rated Power	kW	18.5	22	30
Rated Voltage	V	415	415	415
Full Load Amps	A	38	43	-
Efficiency (η)	%	85	85	86
Speed	RPM	2850	2850	2850
Pump				
Head	m	25	25	30.28
Water flow rate	m^3/hr	180	180	110
Efficiency (η)	%	-	-	-
Speed	rpm	2895	2895	2764
Measured Parameters				
Suction pressure	kg/cm^2	0.0	0.0	-0.1
Discharge pressure	kg/cm^2	0.7	1.8	4.4
Water flow rate	m^3/hr	163	150	98
Power input	kW	16	21	27
Motor Efficiency (estimated)	%	85	85	85
Calculation				
Suction head	m	0	0	-1.25
Discharge head	m	7	17.5	44
Total head	m	7	17.5	45.25
Water flow rate	m^3/s	0.045	0.042	0.027
Density of water	kg/m^3	1000	1000	1000
Hydraulic power	kW	3.11	7.15	12.08
Shaft power	kW	13.34	18.02	22.82
System efficiency	%	19.81	33.74	45.00
Pump efficiency	**%**	**23%**	**40%**	**53%**
% loading of flow	%	91%	83%	89%
% loading of head	%	28%	70%	149%
% Motor loading	%	72%	82%	77%
SEC (kWh/m3)		0.10	0.14	0.27

2.5 Effluent Treatment Plant (ETP) and Underground reservoir (UGR) tank:

Cooling tower blowdown and "N" pit water are sent to ETP for treatment and after treatment the clean water is pumped into the UGR tank. UGR water is used for:

1. Horticulture water;
2. Ash water;
3. Service water and
4. Fire water

Table 10: Water Consumption and Balancing (ETP & UGR Tank)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT Blowdown + 'N' pit)	83	2.15	1	7.4	178		
1.2	CT Blowdown					158		
	Inflow of ETP				7.4	178		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter Feed Pump)	39	4.0	1	6.5	156		
	Outflow of ETP				6.5	156		
	Difference (storage in equitation tank)				0.94	22.44		Storage in equitation tank
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				6.5	156		
	Inflow of UGR				6.5	156		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Use to ash water, horticulture and service water					156		
	Outflow of					156		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	UGR							

Table 11: Assessment of Water Pumps Performance (Filter Feed Pump)

Particulars	Unit	Pump
Design Details		
Motor		
Rated Power	kW	7.5
Rated Voltage	V	415
Full Load Amps	A	15.4
Efficiency (η)	%	90.1
Speed	RPM	-
Pump		
Head	M	35.5
Water flow rate	m^3/hr	60
Efficiency (η)	%	-
Speed	rpm	-
Measured Parameters		
Suction pressure	kg/cm^2	0.2
Discharge pressure	kg/cm^2	2.3
Water flow rate	m^3/hr	39
Power input	kW	5
Motor Efficiency (estimated)	%	85
Calculation		
Suction head	M	1.5
Discharge head	M	23
Total head	M	21.5
Water flow rate	m^3/s	0.011
Density of water	kg/m^3	1000
Hydraulic power	kW	2.28
Shaft power	kW	4.22
System efficiency	%	46.00
Pump efficiency	%	54%
% loading of flow	%	65%
% loading of head	%	61%
% Motor loading	%	52.98
SEC (kWh/m3)		0.13

2.6 Circulating Water (CW) Pumps, Auxiliary Cooling Water (ACW) Pumps and Auxiliary Cooling Water (ACW) Booster Pumps:

CW pumps and ACW pumps supply water from cooling tower cold basin to the condenser from where the return water is sent to cooling tower. There are three

CW pumps, of which one pump is in operation during study period (at 55% loading) and each CW Pump capacity is of 8600 m³/hr.

There are two ACW booster pumps provided for each unit to meet the auxiliary equipment cooling requirements, of which generally one pump is in operation during study period (at 55% loading). These pumps take suction from condenser cooling water inlet header and after heat exchange duty the water is returned to condenser cooling water outlet header.

Operational schedule of the CW pumps, ACW pumps and CW booster pumps at different unit loading condition:

- At partial load (55%) = 1 CWP + 1 ACW Booster pump are in operation.
- At full load (100%) = 2 CWPs +1 ACW Booster pump are in operation.

2.6.1 Water distribution circuit diagram is given below:

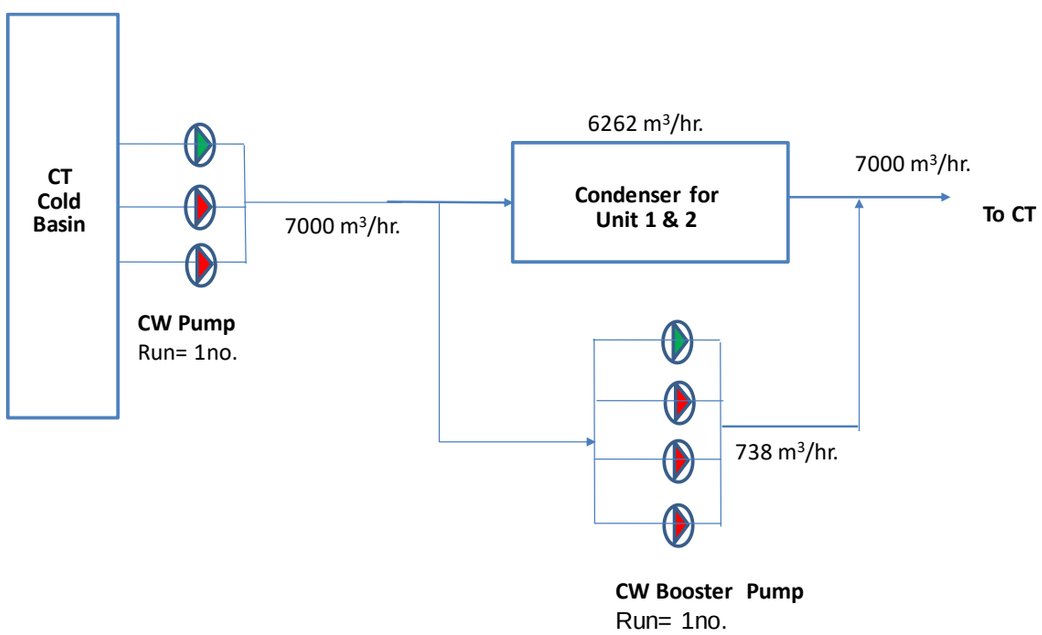


Table 12: Water Consumption and Balancing (CW & ACW)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m³/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m³/hr) (@24hrs / day).	Avg. Flow (m³/day)	Remarks
1	Cooling Water (CW) System					
1.1	CW Pump-1	6200	24	6200	148800	* 1 CWP + 1 ACW booster pump are run at partial load (55%) = 55% x 2x45MW =
1.2	CW Pump-3	6900	24	6900	165600	

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
						49.5MW. * 2 CWPs + 1 ACW booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1.3	CW Pump - 3 (Single run @ 55% load)	7000	24	7000	168000	*When only CWP - 3 runs at 55% loading.
1a	Total Cooling water flow at partial load (55%).			7000	168000	* 1 CWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
1b	Total Cooling water flow at full load (100%).			13100	314400	* 2 CWPs + 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
** 1 CWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.* ** 2 CWPs + 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.*						
1	**ACW Booster Pumping System**					
1.1	ACW Booster Pump 1 (U#1)	738	24	738	17712	*1 ACW Booster pump is run at partial load (55%) = 55% x 2x45MW = 49.5MW. *1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1	Avg. of ACW Booster pump	738		738	17712	
	CW Flow to Condenser (by calculation)					
1	CW flow to Condenser at partial load (55%) = 55% x 2x45MW = 49.5MW.	6262	24	6262	150288	* 1 CWP - 1 ACWP are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
2	CW flow to Condenser at full load (100%) = 100% x 2x45MW = 90MW.	12362	24	12362	296688	* 2 CWPs - 1 ACWP are run at full load (100%) = 100% x 2x45MW = 90MW.

Table 13: Assessment of Water Pumps Performance

1 CWP + 1 ACW booster pump are run at partial load

Particulars	Unit	CW Pump - 3 (Only CW 3 Running)	U#1 Booster Pump 2
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	700	55
Rated Voltage	V	11000	415
Full Load Amps	A	46.7	96
Efficiency (η)	%	94.7	93
Speed	RPM	745	1416
Pump			
Head	m	23.16	25
Water flow rate	m^3/hr	8600	500
Efficiency (η)	%	-	-
Speed	rpm	745	1416
Measured Parameters			
Suction pressure	kg/cm^2	0.0	1.0
Discharge pressure	kg/cm^2	1.7	2.8
Water flow rate	m^3/hr	7000	738
Power input	kW	592.97	56
Motor Efficiency (estimated)	%	90	85
Calculation			
Suction head	m	0	10
Discharge head	m	16.5	28
Total head	m	16.5	18
Water flow rate	m^3/s	1.944	0.205
Density of water	kg/m^3	1000	1000
Hydraulic power	kW	314.74	36.20
Shaft power	kW	533.68	47.58
System efficiency	%	53.08	64.66
Pump efficiency	%	59%	76%
% loading of flow	%	81%	148%
% loading of head	%	71%	72%
% Motor loading	%	80%	95%
SEC (kWh/m3)		0.08	0.08

Analysis and observation

1. **Circulating Water (CW) Pump 3 (only CW pump run at partial load):** Pump efficiency of 59% is found to be much below as compare with design value 85%. The operational factors influencing efficiency variation is felt to have lower loading on flow and lower loading on head.
2. **Unit#1, ACW Booster Pump 2:** Pump efficiency of 76% is found to be below as compare with design value 85%. The operational factors influencing efficiency variation is felt to have higher loading on flow and lower loading on head.

Table 14: Assessment of Water Pumps Performance

2 CWPs + 1 ACW booster pump are run at full load

Particulars	Unit	CW Pump - 1 (CWP1 + CWP 3 run)	CW Pump - 3 (CWP1 + CWP 3 run)
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	700	700
Rated Voltage	V	11000	11000
Full Load Amps	A	46.7	46.7
Efficiency (η)	%	94.7	94.7
Speed	RPM	745	745
Pump			
Head	m	23.16	23.16
Water flow rate	m^3/hr	8600	8600
Efficiency (η)	%	85	85
Speed	rpm	745	745
Measured Parameters			
Suction pressure	kg/cm^2	0.0	0.0
Discharge pressure	kg/cm^2	2.1	2.1
Water flow rate	m^3/hr	6200	6900
Power input	kW	589	628
Motor Efficiency (estimated)	%	90	90
Calculation			
Suction head	m	0	0
Discharge head	m	21.3	21.3
Total head	m	21.3	21.3
Water flow rate	m^3/s	1.722	1.917

Particulars	Unit	CW Pump - 1 (CWP1 + CWP 3 run)	CW Pump - 3 (CWP1 + CWP 3 run)
		Pump	Pump
Density of water	kg/m³	1000	1000
Hydraulic power	kW	359.86	400.49
Shaft power	kW	530.11	564.80
System efficiency	%	61.10	63.82
Pump efficiency	%	68%	71%
% loading of flow	%	72%	80%
% loading of head	%	92%	92%
% Motor loading	%	80%	85%
SEC (kWh/m3)		0.10	0.09

Analysis and observation

1. **Circulating Water (CW) Pump 1 (CWP 1 + CWP 3 run):** Pump efficiency of 68% is found to be much below as compare with design value 85%. The operational factors influencing efficiency variation is felt to have lower loading on flow and lower loading on head.

2.7 Cooling Tower System

Performance Evaluation of Cooling Tower at partial loading (55%) is given below:

Date: 3rd July 2020
At Partial Loading (55%) = 55% x (2x45MW) = 49.5MW

Table 15: Performance Evaluation of Cooling Tower

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
	Cooling Tower (CT) System					
1	Unit Load	MW	24	25	49	At NCR 45MW as per design.
	% of NCR	%	54%	55%	54%	
2	CW flow	m³/hr	7000		7000	Design flow (8600 m³/hr.
3	CW inlet water temperature	°C	32	31.87	32	
4	CW outlet water temperature	°C	40	41.47	41	
5	Temperature difference	°C	9	10	9	10°C as design.
6	DBT at ambient	°C			26	
7	WBT at ambient	°C			26	
8	C.O.C				6.3	
9	Evaporation loss	m³/hr			98	

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
		%			1.39%	As per design 1.67%.
10	Blow down as per calculation	m^3/hr			19	
11	Total CT make-up as per calculation	m^3/hr			116	
12	Range	^oC			9	
13	Approach	^oC			5.86	4^oC as per design
14	Effectiveness				0.61	

2.8 Condenser System

Performance Evaluation of Condenser System at partial loading (49%) is given below:

Date: 3rd July 2020

At Partial Loading (55%) = 55% x (2x45MW) = 49.5MW

Table 16: Performance Evaluation of Condenser System

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Condenser System					
1	Unit Load	MW	24	25	49	At NCR 45MW as per design.
	% of NCR	%	54%	55%	54%	
2	CW flow of condenser (by calculated)	m^3/hr	6262		6262	7923 m^3/hr at 100%loading.
3	CW inlet water temperature	^oC	32	31.87	32	32^oC as design.
4	CW outlet water temperature	^oC	40	41.47	41	42^oC as design.
5	Temperature difference	^oC	9	10	9	10^oC as design.
6	Condenser Thermal Load as run condition	million kCal/hr			57	

3 Environmental Compliances Related to Water

Being a reputed thermal power generating company of Uttar Pradesh state, Barkhera Unit of Bajaj Energy Limited (BEL) always makes it a point to fulfil the environmental compliances as per the guidelines given by **Central Ground Water Authority (CGWA)** and **Uttar Pradesh Pollution Control Board (UPPCB)**.

Table 17: Compliances related to Water

Sl. No.	Condition	Status/ Compliance	Remarks
1	The plant may extract 6,984 m3/day (≤20,95,850m3/year) with two existing bore wells.	The plant is maintaining the water withdrawal limit	Checked during visit
2	Digital Meters must be installed at each bore well and log book must be maintained	Digital meters are installed for both bore well and log book is maintained	
3	Ground water level monitoring through existing piezometers.	Plant is continue monitoring the ground water level	Ground water level data for last one year-Annexure-I
4	Recycling and reuse of waste water	Complied	-

Water Saving Potential at Bajaj energy units of having capacity (2 x 45 MW each)		
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m^3/MWH.		
While as per CGWA NOC BEL plants are entitled for daily ground water withdrawal of 6984 m^3/day which is equivalent to 3.23 m^3/MWH at station full load running condition. This withdrawal limit is already less than MOEF norms		
Recently CGWA has issued guideline dated 24 sept 2020 which states as following "All industries abstracting ground water in excess of 100 m^3/day shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means. "		
Therefore we have worked out the maximum water saving potential in all BEL stations and also worked out best specific water consumption which can be achieved by BEL stations		
Specific water consumption As per MOEF (m^3/MWH)	3.50	
Approved water quantity per day by CGWA(m^3/day)	6984	
Specific water consumption As per CGWA Approved water quantity (m^3/MWH)	3.23	
A. Water consumption Break up at full load at COC-7	Quantity (m3)	Remarks

Evaporation Loss (m^3/Day)	5914	
Drift Loss (m^3/Day)	6	
COC	7	
Blow Down loss(m^3/Day)	986	
Cooling Tower Make up(m^3/Day)	6906	
Potable Water Quantity (m^3/day)	10	
Evaporation loss from water reservoir (m^3/day)	3	
DM Plant Make up(m3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	6984	
Horticulture (m^3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (m3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption

B) Saving Potential at Full Load Condition

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 591 M3 Water may be utilised as CT Make up

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	591	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(m3/Day)	6314	
DM Plant Make up(M3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (m3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (m3/Day)	50	
Total Bore well water required(m3/day)	6443	
Water saving from approved Quantity (m^3/day)	541	
% Water Saving from approved Quantity)	7.8%	

Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9

Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	5914	

Drift Loss (M3/Day)	6	
COC	9	
Blow Down loss(M3/Day)	739	
Water Being used as CT make up from UF RO System(70% recovery)	517	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	6142	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	6270	
Water saving from approved Quantity (M3/Day)	714	
% Water Saving from approved Quantity	10.2%	
Maximum Possible water saving is 10.20%		

We have also worked water saving potential at 80% Loading factor.		
Specific water consumption As per MOEF (M3/MWH)	3.50	
Proportionate water quantity at 80% Loading Factor per day(m3/day)	5587	80% quantity
Specific water consumption As per CGWA Approved water quantity (M3/MWH)	3.23	
C. Water consumption Break up at 80% load at COC-7	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	7	
Blow Down loss(M3/Day)	789	
Cooling Tower Make up(M3/Day)	5525	
Potable Water Quantity (m3/day)	10	
Evaporation loss from water reservoir (m3/day)	3	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	5603	
Horticulture (M3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (M3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption
D) Saving Potential at 80% Load Condition		

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7		
Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 414 M3 Water may be utilised as CT Make up		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	473	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	5052	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5180	
Water saving from approved Quantity (M3/Day)	407	
% Water Saving from approved Quantity)	7.3%	
Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9		
Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	9	
Blow Down loss(M3/Day)	591	
Water Being used as CT make up from UF RO System(70% recovery)	414	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	4914	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5042	
Water saving from approved Quantity (M3/Day)	545	

% Water Saving from approved Quantity	9.8%	
% Water Saving from approved Quantity : 9.8%		

Conclusion: It is seen from the above working that 20% reduction target is difficult to achieve in thermal power plants.

Apart from the above, plant will take up annual water audit exercise, adopt measures to reduce fresh water consumption, monitor ground water and will submit relevant data to the concerned authority.

Table 18: Plant Production and Consumption Details

Sl. No.	Description	2019-20 (July, 2019-June, 2020)
1	Total Power Generation (MWh)	65244
2	Total Raw Water Consumption (m3)	197838
3	Specific Raw Water Consumption (m3/MWh)	3.03

Table 19: Treated Water Parameters

Sl. No.	Location	Parameter	Unit	Actual Value	CPCB Standard Value (Inland Surface Water)
1	ETP I/L	pH	-	6.98	-
2		Total Suspended Solid (TSS)	mg/l	92	-
3		Bio-chemical Oxygen Demand (BOD)	mg/l	86	-
4		Chemical Oxygen Demand (COD)	mg/l	326	-
6	ETP O/L	pH	-	7.69	5.0-9.0
7		Total Suspended Solid (TSS)	mg/l	26	100
8		Bio-chemical Oxygen Demand (BOD)	mg/l	22	30
9		Chemical Oxygen Demand (COD)	mg/l	62	250

***Sample collected on 12/06/2020 by third party.**

Table 20: Ground Water Parameters

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
1	Colour	HZN	<5.0	5 max	15 max
2	Odour	-	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1.0	1 max	5 max
5	pH	-	7.46	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	192	200 max	600 max
7	Iron (Fe)	mg/L	0.13	0.3 max	No Relaxation
8	Chloride (Cl)	mg/L	62	250 max	1000 max

9	Residual Free Chlorine	mg/L	<0.2	0.2 min	1
10	Sulphates (SO_4)	mg/L	24	200 max	400 max
11	Total Alkalinity	mg/L	196	200 max	600 max
12	Fluoride (F)	mg/L	0.2	1.0 max	1.5 max
13	Total Dissolved Solid (TDS)	mg/L	420	500 max	2000 max
14	Total Coliform	MPN/100ml	Not Detected	-	-
15	E coli	/100ml	Not Detected	-	-

***as per IS 10500**
Sample collected on 12/06/2020 by third party.

From the above tables, it is evident that the plant is complying with the relevant parameters mentioned by CGWA and UPPCB.

4 Water And Energy Conservation Options

4.1 RECOMMENDATION – 1: Pump Efficiency Improvement by overhauling of CW pumps and operating near design flow & head after proper designing the pump discharge pipe layout for equal flow at full condition.

Present Scenario

As a part of the water audit study, operating performance of the CW pump 1& 3 were assessed by measuring different parameters, like flow, pressure & corresponding power input to the drive motor. It was observed that the said pumps were operating with low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumps to be operate near design flow and head, effecting the pump efficiency inprove.

Table 21: Cost Benefit Analysis for Recommendation 1

Item Ref	Unit	CW Pump - 1 (CWP1 + CWP 3 run)	CW Pump - 3 (CWP1 + CWP 3 run)	Total
Present Condition:				
No of pumps operation	No	1	1	
Motor input (Avg.)	KW	589.01	627.56	
Water flow (Avg.)	m3/hr	6200	6900	
Total Head Dev (THD) (Avg.)	mWC	21.3	21.3	
Liquid kW / Pump shaft power (Avg.)	KW	359.864	400.493	
System Efficiency (Pump & motor) (Avg.)	%	61.10%	63.82%	
Proposed Condition:				
Pump Efficiency under proposed condition (Avg.)	%	75	75	
Motor efficiency (assume)	%	90	90	
Proposed system Efficiency (Pump & motor)	%	67.5	67.5	
Proposed motor input (pump set)	KW	533.13	593.32	
Power savings of each pump	KW	55.88	34.24	
Annual Hrs. operation	Hrs/Yr	1500	1500	
Envisaged reduction in annual energy consumption in the pump drives.	kWh	83823	51356	135179
	MU/Yr	0.08	0.05	0.135

Item Ref	Unit	CW Pump - 1 (CWP1 + CWP 3 run)	CW Pump - 3 (CWP1 + CWP 3 run)	Total
Unit selling Price	INR/kWh	3.25	3.25	
Annual Energy Cost savings potential	INR in Lakhs	2.72	1.67	4.393
Investment for Overhauling and proper designing the pump discharge pipe layout	INR in Lakhs	5	5	10.00
Simple Pay Back Period	Yrs	1.83	2.99	2.27

4.2 RECOMMENDATION – 2: Pump Efficiency Improvement by overhauling of CW pumps and operating near design flow & head after proper designing the pump discharge pipe layout for equal flow at partial load.

Present Scenario

As a part of the water audit study, operating performance of the CW pump3 was assessed by measuring different parameters, like flow, pressure & corresponding power input to the drive motor. It was observed that the said pump was operating with low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumpto be operate near design flow and head, effecting the pump efficiency inprove.

Table 22: Cost Benefit Analysis for Recommendation 2

Item Ref	Unit	CW Pump - 3 (Only one pump run at partial load)
Present Condition:		
No of pumps operation	No	1
Motor input (Avg.)	KW	592.97
Water flow (Avg.)	m3/hr	7000
Total Head Dev (THD) (Avg.)	mWC	16.5
Liquid kW / Pump shaft power (Avg.)	KW	314.74
System Efficiency (Pump & motor) (Avg.)	%	53.08%
Proposed Condition:		
Pump Efficiency under proposed condition (Avg.)	%	75
Motor efficiency (assume)	%	90
Proposed system Efficiency (Pump & motor)	%	67.5
Proposed motor input (pump set)	KW	466.28
Power savings of each pump	KW	126.69
Annual Hrs. operation	Hrs/Yr	1500
Envisaged reduction in annual energy consumption in the pump drives.	kWh	190042
	MU/Yr	0.19
Unit selling Price	INR/kWh	3.25
Annual Energy Cost savings potential	INR in Lakhs	6.18
Investment for Overhauling and proper designing the pump discharge pipe layout	INR in Lakhs	5
Simple Pay Back Period	Yrs	0.80

5 Rain Water Harvesting

5.1 Rain Water Harvesting Programme

Rain Water Harvesting, is an age-old system of collection of rainwater for future use. But systematic collection and recharging of ground water, is a recent development and is gaining importance as one of the most feasible and easy to implement remedy to restore the hydrological imbalance and prevent a crisis. Rain water harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later. Rooftop rainwater harvesting: Rooftop rainwater from the administrative office area, factory area and other plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells.

The recharge wells will be provided with recharge bores to facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside the recharge well ensure efficient filtration. In addition to this Rain water harvesting and groundwater recharge structures will also be constructed outside the plant premises to augment the ground water level.

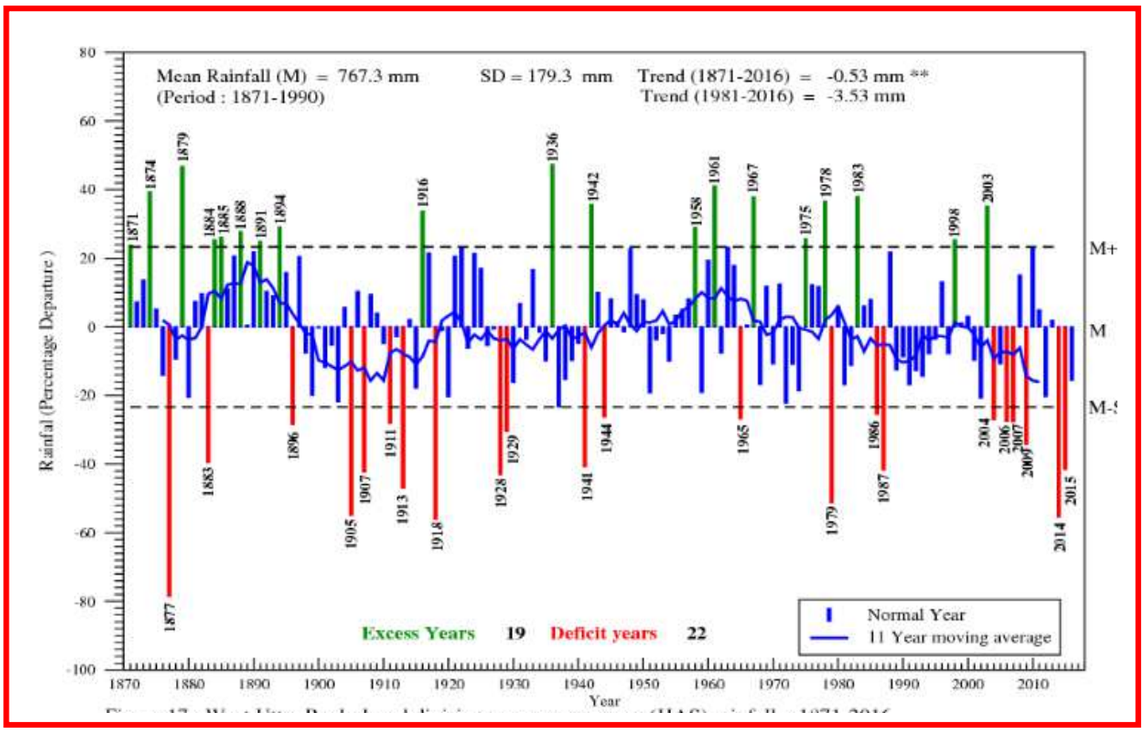
In scientific terms, water harvesting refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage and all other hydrological studies and engineering inventions, aimed at conservation and efficient utilization of the limited water endowment of physiographic unit such as a watershed. Rain is a primary source of water for all of us. There are two main techniques of rainwater harvesting:

- Storage of rainwater on surface for future use
- Recharge to groundwater

Directly collected rainwater can be stored for direct use or can be recharged into the groundwater. All the secondary sources of water like rivers, lakes and groundwater are entirely dependent on rain as a primary source.

Rainwater harvesting structures shall be provided to recharge the groundwater resources in the region. The run-off water from the roof of the structures and paved areas shall be collected through storm water drainage system and led to rain water harvesting structure.

Annual Rain Fall	767.3 mm (West UP)



5.2 Rainwater Harvesting Facilities

For augmenting the ground water resources in the plant premises, number of rainwater harvesting pits will be constructed and the internal drains where excess rain water flowing in drain will be diverted to these pits. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. The roof top water will be routed to the storm drains. This will result in increase in groundwater tables and to some extent the improvement of ground water quality.

Rainwater Harvesting in Barkhera unit will be very useful. With respect to the physical alternatives to fulfil sustainable management of freshwater, there are two solutions - first reuse the rainwater at washroom, gardening and the second is for ground water recharge.

The size and the locations of rainwater harvesting pits will be decided during detailed engineering of the project.

Run off from the proposed project site is calculated using rational formula:

$$Q = C \times I \times A$$

Q = Run-off in m3/hr

A = Catchment Area (Sq.m)

C = Coefficient of Run-off

I = intensity of Rainfall in mm/yr

5.3 Rain Water Harvesting Potential Calculation

Table 23: Rainfall Data

Particulars	Unit	Values
Intensity of rainfall (in mm) based on IMD Data	mm/yr	767.3
No. of rainy days		48
Rainfall per day	mm/day	15.985
	m/day	0.0160

Table 24: Roof Top area

Description	Unit	Values									
		TG Building	Deaerator Floor	Stores	Switchyard control room	DM Plant MCC & Lab	ESP Control room	CHP Control room	UGR MCC	Boiler roof	Unit Panel Room
Drainage area in m2	m2	2170	860	360	84	120	250	160	60	500	60
Coefficient of run-off	-	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Runoff	m3/day	29.485	11.685	4.892	1.141	1.631	3.397	2.174	0.815	6.794	0.815
Total runoff	m3/day	62.829									

Table 25: Storage Potential*

Location	Unit	*Values
TG Building	m3/day	11.79
Deaerator Floor	m3/day	4.67
Stores	m3/day	1.96
Switchyard control room	m3/day	0.46
DM Plant MCC & Lab	m3/day	0.65
ESP Control room	m3/day	1.36
CHP Control room	m3/day	0.87
UGR MCC	m3/day	0.33
Boiler roof	m3/day	2.72
Unit Panel Room	m3/day	0.33
Total	**m3/day**	**25.13**

***Considering 40% collection efficiency**

5.4 Recommendation for use of rain water

- The collected rain water can be pumped to a combined filtration system for removal of suspended solids and other impurities. Sand filter and activated carbon filter can be installed for filtration of rainwater before reuse.
- The following overarching goals apply to the implementation of rain water harvesting and reuse systems:
  - ✓ Reduction of rain water pollutant loads and flows to surface waters, helping achieve local rain water management requirements;
  - ✓ Reduction of the demand on potable water sources; and
  - ✓ Reduction of stress on the existing water supply infrastructure.
- Additionally, rain water harvesting and reuse systems can be used to help achieve Leadership in Energy and Environmental Design (LEED) and other sustainable design credits related to rain water quantity and quality as well as water efficiency.
- Although rain water harvesting and reuse systems appear to be a viable alternative to help achieve required rain water management standards as well as reducing the demand on the potable water supply, they are not without concerns. Concerns include human exposure to pathogens, cross-contamination of the potable water supply and exposure due to ingestion of crops potentially contaminate harvested rainwater for bacteriological parameters and other organic load before reuse in processes.

6 Motor Load Survey

The motor load survey is given below:

Table 26: Motor Load survey

Bore well Pump - 1 (Near CT)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	18.5	415	-	90	420	32	0.68	15.70	76.36
Bore well Pump - 2 (Near Storage)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	22.0	415	-	90	417	34	0.85	21.20	86.73
MGF Feed pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	-	415	-	85	417	44	0.71	**22.39**	-
N-Pit Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	30.0	415	-	85	419	44	0.85	26.85	76.08
DM Transfer Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	10.0	415	-	82	419	16	0.70	8.09	66.35
CW Pump - 3 (@ 53%) (only one pump run)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11417	37.80	0.79	592.97	80.22
CW Pump - 1 (CWP1 +CWP 3 run)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11127	38.40	0.80	589.01	79.69
CW Pump - 3 (CWP1 +CWP 3 run)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11271	40.08	0.80	627.56	84.90

U#1 Booster Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	93	432	86.00	0.87	55.98	94.66
Filter Feed Pump (ETP)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	-	80	423	11.30	0.60	4.97	52.98

7 Check List For Self-Assessment For Determining Water Efficiency For Facility Managers

Sl. No.	Activities	Descriptions	Frequency
1	Monitoring of cycle of concentration	Cooling towers are normally designed for a COC of 5 with requirement of makeup water typically about 2.1% of water flow (comprising of 1.7% evaporation loss, 0.05% drift loss and 0.35% as blow down). By increasing the COC, the blow down quantity can be reduced by external water treatment and adding water treatment chemicals, COC of even 10 can be reached. Increasing COC can result in significant savings of water as the blow down will be further reduced by suitably improving the chemical regime of circulating water, if feasible.	Weekly
2	Monitoring of leaks and overflows	Leakages from valves, taps, fire fighting hoses, underground fire fighting lines, cooling tower basin, gardening hoses area also a source of water loss. There lies a possibility of reducing the water consumption by plugging the leakages. For every litre of water lost in a water network, another litre of water has to be treated and pumped through the distribution network to compensate.	Weekly
3	Installation of Pressure Gauges and Monitoring	In both the suction and discharge side of the circulating pumps. If the gauge indicates the pressure (or pressure drop) in the process, that information is valuable only if one can do something about it like cleaning a filter.	Daily
4	Calibration of Water flow meters	Annual Calibration of all the water flow meters and pressure gauges must be ensured. A calibrated instruments ensures that the measurements and readings taken are authentic and hence can be used for reference for other study very easily	Annual
5	Operational hours of the circulating pumps to be monitored	In the log book on a continuous basis. Inclusion of operational hours in the log book keeps a track record of the running hours of individual pumps and hence is helpful to optimize the pumping operations if required.	Daily
6	Water quality test report of the Cooling Tower basin	To be conducted in shift-wise. This is important to ensure that COC of the cooling tower is maintained at the desired level to reduce the cooling tower blow down.	Shift wise
7	Maintenance of log book of the cooling tower make up water flow and soft plant water flow	A log book of the cooling tower make up water flow and soft plant water flow In the cooling tower to be maintained. Soft water being a costly water should be monitored along with the makeup water for cooling tower.	Daily
8	Monitoring the amount of	Determining whether discharge from any one operation can be substituted for fresh water supply to another operations. In	Daily

Sl. No.	Activities	Descriptions	Frequency
	discharge water	many cases, where water quality is not much of significance but is only used for washing and cooling purposes, the use of discharge water is recommended over fresh water.	
9	Reuse of wastewater after treatment	Handling waste materials in a dry mode wherever possible. Use of even waste water should be minimized as far as possible.	Daily
10	Monitoring of raw water consumption	Reduction in water consumption in processes by closely monitoring of timings of processes and water circulation.	Daily
11	Monitoring of Rainwater collected in reservoir/ pond	Collection of rain water from factory premises to reservoir / ponds for future use to reduce the raw water intake	Daily

Annexure-I

Ground Water Level monitoring data for BEL Barkhera Unit are given below:

Period	Ground Water Level (m)
Jan, 2020	3.91
Feb, 2020	3.83
Mar, 2020	3.59
April, 2020	3.58
May, 2020	3.92
June, 2020	4.31
July, 2020	4.16

Benchmarks

The flowing table presents the Water Consumption Norms of few countries and water consumption levels of some of major Thermal Power Plants in the country:

S No	Reference	Norm
1.	USA (*Source: National Renewable Energy Laboratory Report on Consumptive Water Use for US power Production*)	1.8 Ltrs/kWh
2.	South Africa (*Source: MIT Report on Water Footprint of Electric Power Generation*)	2.02 Ltrs/kWh
3.	National Norm for 500MW Indigenous Coal Based Plant with wet Cooling Tower (*Source: CEA Report minimization of water requirement in coal based Thermal Power station*)	3.0 ltr/kWh
4	National Norm 660MW Coal Based Super Thermal Power plant with ash water recycling (*Source: FICCI Bulletin on Energy Efficiency 2006*)	3.0 -4.0 m^3/MW
5	National Norm 660MW Coal Based Super Thermal Power plant without ash water recycling. (*Source: FICCI Bulletin on Energy Efficiency 2006*)	4.0 -4.5 m^3/MW
6	Water Consumption in Some of the Power plant in India (Source of data: Declared by the plant)	
(a)	Vidhyachal Stage I (6 X 210MW) (Raw water consumption is 4000m3/hr with AWRS in operation).	3.17m^3/MW
(b)	Vidhyachal Stage II (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m^3/MW
(c)	Vidhyachal Stage III (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m^3/MW
(d)	Rihand thermal Power Station-Stage I & II(2 X 500MW + 2 X 500 MW) with AWRS in operation	3.21

NATIONAL PRODUCTIVITY COUNCIL

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Report

on

Water Audit Study

at

Bajaj Energy Limited

(Khamberkhera Unit)

Submitted to

Bajaj Energy Limited

Khamberkhera Unit

Shardanagar Road, Lakhimpur Kheri

Uttar Pradesh – 261 506.

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(August 2020)

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Mr. Parag Bajpai, O&E head,

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National Productivity Council

Water Audit Team

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Executive Summary

As part of on-going efforts to reduce Water Consumption, the progressive management of Bajaj Energy Limited approached NPC to carry out the Water Balance study of its 5 plants in Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur). The study is intended to be a Detailed Water audit study of the above Plants regarding their existing operating status of water use and suggesting relevant water conservation measures to be adopted to bring down the water consumption in the plant.

As a result, NPC team has carried out the field visit for water audit study at 5 Power Plants of Bajaj Energy Limited in July 2020. Available data pertaining to various key parameters were collected from the concerned officials. The necessary field measurements were carried out during the field study for assessing the existing water use scenario and to identify the water conservation measures. The report has been prepared for Khamberkhera Plant based on the data/information collected/measurement taken by the NPC team and observations made during the field study are discussed in this report.

The following recommendations and findings made as per the observation of the study team:

Water Usage Scenario

The source of water is from two numbers of borewell pump installed in the plant.

Specific water consumption is established on the basis of historical data collected from the plant and the same is tabulated below:

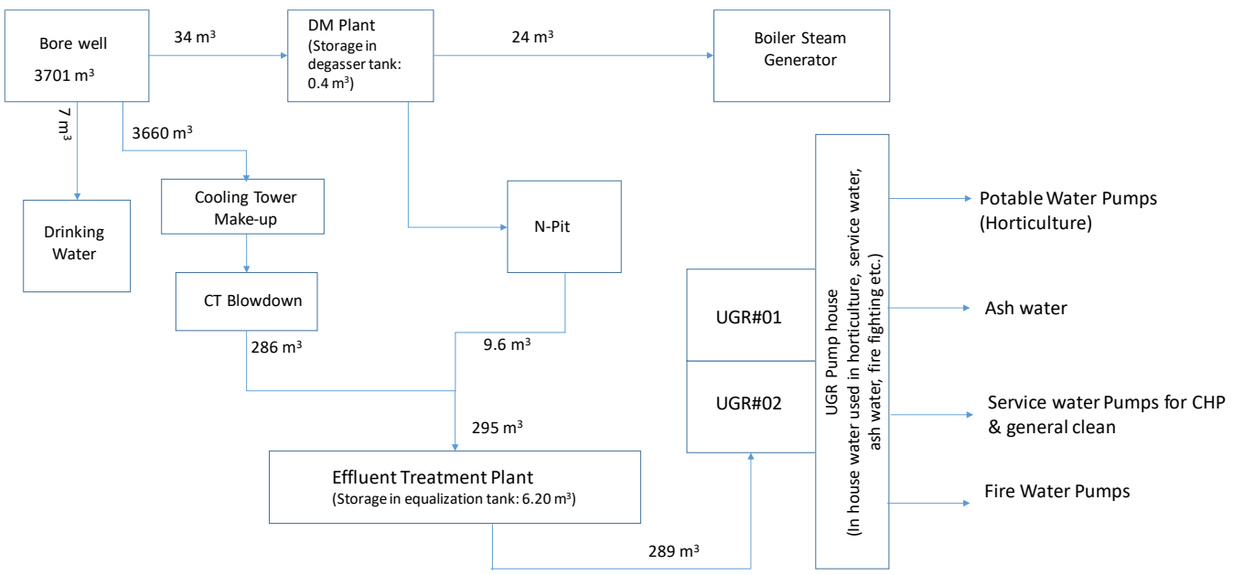
Table 1: Specific Water Consumption

Particulars	Unit	Value	Standard
Generation of 2 units (@45MW)*(July 2019 to June 2020)*	MU	60.055	• Standard Specific water consumption = 3.5 m^3/MWh.(as per MOEF notification dated 7th Dec'15)
Water consumption *((July 2019 to June 2020)*	m^3	183673	
Specific water consumption (m^3/MWh)	m^3/MWh	3.06	

**Period: July 2019 to June 2020.*

** Standard values for close loop circuil system.*

Actual measurement of Total water distribution on particular day at different usage areas is illustrated in the diagram below:


Bore well
3701 m³
34 m³
DM Plant
(Storage in degasser tank: 0.4 m³)
24 m³
Boiler Steam Generator
7 m³
3660 m³
Drinking Water
Cooling Tower Make-up
CT Blowdown
286 m³
N-Pit
9.6 m³
295 m³
Effluent Treatment Plant
(Storage in equalization tank: 6.20 m³)
289 m³
UGR#01
UGR#02
UGR Pump house
(In house water used in horticulture, service water, ash water, fire fighting etc.)
Potable Water Pumps (Horticulture)
Ash water
Service water Pumps for CHP & general clean
Fire Water Pumps

Water Consumption and Water Balancing

Water consumption at different sections of the plant is given below: -

Table 2: Overall Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	154.20	3701	
2	**Total Outflow**			
2.1	DM plant inlet	1.42	34	
2.2	Drinking water	0.29	7	
2.3	CT make-up {1.1 - (2.1+2.2)}	152.49	3660	
	Total outflow	**154.20**	**3701**	

Table 3: Bore well water pumps to DM Plant

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr)	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (near TG Building)	148	10.00	1	61.6	1480		
2	Bore well Pump - 2 (near UGR)	141	15.75	1	92.5	2221		
1	Total Inflow of Raw water Make-up (1+2).				154.2	3701		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	34	1.0	1	1.4	34		
	Inflow of DM plant				1.4	34		.
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	10	2.5	1	1	24		
2.2	N-pit Pump (CT blowdown line to ETP inlet)	48	0.2	1	0.4	9.6		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr)	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	%	Remarks
	Outflow of DM plant (2.1+2.2)				1.4	34		
	Difference				0.02	0.40		Storage in Degasser tank.

Table 4: Water Consumption & Balancing (ETP & UGR)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT blowdown + 'N' pit)	48	6.2	1	12.3	295		
1.2	CT blowdown					285.60		
	Inflow of ETP				12.3	295		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter feed pump)	34	8.5	1	12	289		
	Outflow of ETP				12	289		
	Difference				0.26	6.2		Storage in equalization tank
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				12	289		
	Inflow of UGR				12	289		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Water is used to horticulture + Ash Water + Service Water + Ash yard				9	217		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Outflow of UGR				9	217		
	Difference				3.01	72.25		Storage in UGR tank for to be utilized under plant shutdown condition.

Summary of Recommendations

Water Balance Study by NPC at BEL, Khamberkhera plant has identified saving potential of **0.04MU/year** of Energy and **INR1.15Lakhs/year** of monetary savings. It is suggested that Khamberkhera plant may prioritise below mentioned Water& Energy conservation measures and commence implementation at the earliest. It is the responsibility of the plant personnel to confirm with safety and other statutory requirements before implementing the proposed water and energy conservation measures.

Summary of the Water and Energy Conservation measures identified at Khamberkheraplant is shown below:

Table 5: Summary of the Water and Energy Conservation measures

Sr. No	Particulars	Annual savings potential		Investment (INR in Lakhs)	Simple payback period (Yrs.)
		Energy	Monitory		
		MU/yr.	INR in Lakhs		
2	Pump Efficiency Improved of Circulating Water Pump -1 by overhauling and operating near design flow and head.	0.035	1.15	3.00	2.6
	TOTAL	**0.04**	**1.15**	**3**	**2.6**

General Observations and Recommendations

- Install RO plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.
- Replacement of Underperforming Pumps of Bore well pumps (pumps + motors) by Energy Efficient Pumps and Motors with VFD drive.
- Dust suppression (DS) pumps are in operation during summer season only.
- Avoid overflows of water storage tanks by installing float-controlled valve at drinking water overhead storage tanks.

- Repair installed meters at different areas or zones to monitor flow rates. Manage metered data by setting flow rate thresholds. When exceeded, it indicates possible system leaks.
- To carryout regular inspection of nozzles for clogging and leak and repair the detected leaks;
- Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow.
- Turning off all water flows during shutdowns unless they are essential for clean-up– To use solenoid valves to stop water flow when production stops (valves can be activated by connecting them to drive motor controls).
- Adjust pump cooling and water flushing to the minimum required level. Sharing of information with employees on water usage procedure and amount of water used for each application is recommended. This would promote how employee actions can reduce water usage.
- Place signs and placards near new equipment, making it easy to understand new technology and how to use it properly.

1 Introduction

1.1 Background

Water is one of the key input requirements for thermal power generation. Water is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.

Water is used in almost all areas/ facilities of thermal power stations in one way or other. A typical list of plant systems/ applications requiring consumptive water is indicated as below:

i) Cooling water system for condenser & plant auxiliaries
ii) Power cycle make up
iii) Equipment cooling system
iv) Air conditioning and ventilation system
v) Coal dust suppression system
vi) Service water system
vii) Potable water system
viii) Gardening
ix) Evaporation from raw water reservoir

Difficulties are already being faced in existing thermal power plants due to non-availability of water. This problem is expected to be aggravated in future when more sites would be required. Thus there is a need to minimize consumptive water requirement for thermal power plants. Optimization/ minimization of plant consumptive water includes measures such as judicious utilization of water in different applications, adoption of reduced margins in various consumptive uses, adequate treatment for deteriorating quality of raw water, use of plant waste waters in various low grade applications and recycling of plant waste waters to maximum extent.

Water audit is an important management tool for effective conservation of water. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one is consumption audit on demand side. Water audit in the plant is conducted to identify supplied water quantity, water usage, losses, water quality, identify and priorities areas which need immediate attention for control, raise awareness on monitoring water consumption and to provide suggestions for effective water conservation.

The broad area of scope of work includes performance assessment of raw water sources & existing storage systems, estimation of present water consumption, water balance across the entire system, assessment of water consumption per unit generation, water quality management plan, measures of improving efficiency of water utility networks and also to enhance operational efficiency through controls.

1.2 About the Project

BEL, as part of their energy efficiency and resource conservation endeavours, had initiated the process of Auditing of significant systems/subsystems on a regular basis, with a view of achieving resource consumption optimization and continuous improvement. As a part of it, the management of BEL approached National Productivity Council (NPC), Delhi, to conduct the "Water Audit Study" of five of its plants located in the state of Uttar Pradesh. Onsite measurements for the above stated Water Audit Study was carried out during the month of July 2020.

This report provides details about the scope, methodology, measurements, water balance of individual subsystems and overall plant, findings and recommendations of the water balance study of Khamberkhera plant.

1.3 Objectives and Scope of the Study

The broad objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

The scope of the water audit study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
    - Raw water
    - DM water
    - Circulating water
    - Waste water

- To develop norms for in-house water consumption and use in terms of m3/MWh for monitoring and targeting.
- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.
- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (whereever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:
    - ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.
    - ✓ Laboratory testing & analysis reports for key parameters.

1.4 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Khamberkhera plant.

- ➢ Direct measurement-Using Ultrasonic Flow meter for clear water
- ➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
- Electrical measurements were carried out by using 3 phase Power Analyser.

- Standard pressure gauges were used for monitoring suction &discharge pressures of pumps.

1.5 Instruments Used

- Ultrasonic Water Flow Meter
- 3-phase power analyser

1.6 About Bajaj Energy Limited

Bajaj Energy limited (BEL) is one of the largest private sector thermal generation companies in Uttar Pradesh and is involved in developing, financing and operating thermal power plants in India. BEL has a total installed capacity of comprising 450 MW from five operational plants of 90 MW each owned and managed by Bajaj Energy Limited (BEL), spread across the state of Uttar Pradesh.

BEL has entered into long-term fuel supply agreements with Central Coal Fields Limited & Northern Coal Field, subsidiaries of Coal India Limited & Northern Coal Field, for the supply of coal to the BEL Power Plants. The BEL Power Plants have been fully operational since 2012 and possess an operational track record of more than eight years.

1.7 About National Productivity Council (NPC)

National Productivity Council, an autonomous body under the Ministry of Industry, Government of India, was established in the year 1958, to promote productivity culture in the country. It is a tri-partite, non-profit making organization, with equal representation from the government, employers and workers organizations, apart from technical and professional institutions and other interests on its governing council. NPC, as an apex body, provides consultancy and training in various fields including Energy Management, over the past five decades and undertakes research in the areas of productivity. NPC has 12 regional offices in India and a total strength of about 135 professionals/consultants. NPC with its regional offices located in major cities / industrial cities has unique advantages in carrying out multi location assignments and assignments on all India basis.

Energy Management group of NPC has a total strength of around 30 fulltime EM professional out of which around 18 are certified Energy Auditors and about 10 are accredited energy auditors from Bureau of Energy Efficiency. NPC provides consultancy as well as capacity building services to several

international, national as well as unit level clients. EM Group offers consulting services in various sectors including industry, power generation, distribution, commercial, agriculture and SME clusters.

1.8 About the Plant

The total installed capacity of BEL Khamberkhera plant is 90 MW (2x45MW).The major performance parameters of the Plant for the period of 6th to 12th July 2020 are:

Table 6: Performance parameters of the Plant

Parameters	Units	Unit 1 (45MW)	Unit 2 (45MW)	Station
Avg. Generation	MW	28.20	27.91	56.11
Avg. daily Steam (Boiler)	TPH	116.29	112	228.04
DM Make-up	TPD	10.00	10.00	20.00
DM Make-up	TPH	0.417	0.417	0.83
% of DM Make-up	%	0.36%	0.37%	0.37%

2 Existing System

2.1 Installed Capacity

BEL, Khamberkhera plant has an installed capacity of 90 MW as per the details given below:

2 x 45 MW	=	90 MW
Total	=	**90 MW**

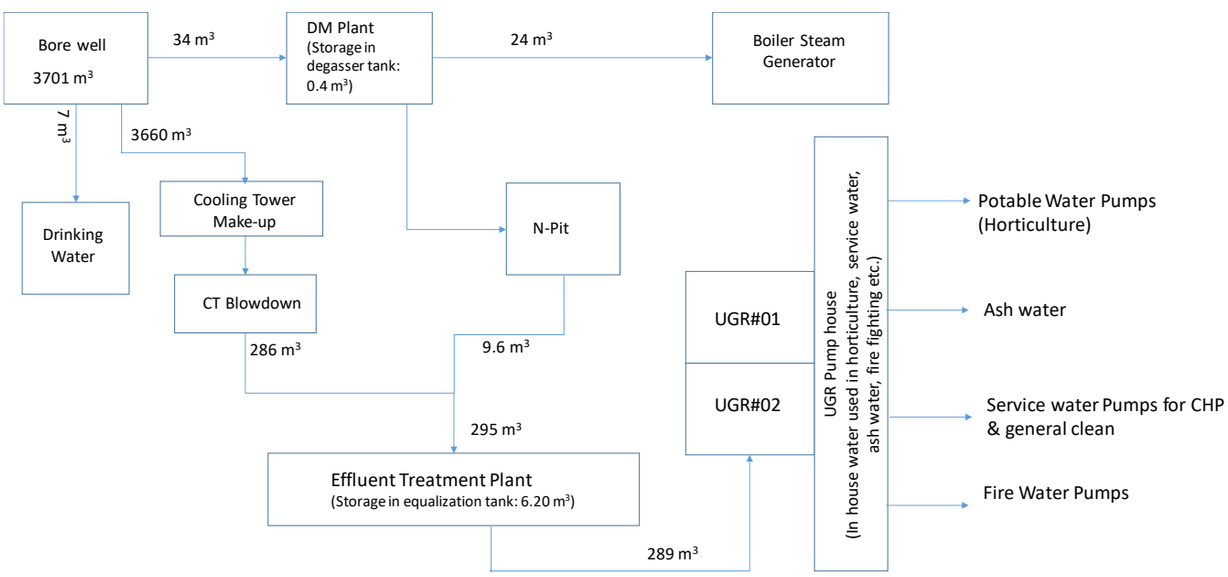
The following section describes the specifications of equipment related to various water systems in the plant.

2.2 Overall Water Balance Summary of the plant

Table 7: Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	154.20	3701	
2	**Total Outflow**			
2.1	DM plant inlet	1.42	34	
2.2	Drinking water	0.29	7	
2.3	CT make-up {1.1 - (2.1+2.2)}	152.49	3660	
	Total outflow	154.20	3701	

2.3 Overall Water Balance Diagram of the plant



2.4 Bore well water and DM Plant

Khamberkhera plant draws raw water from underground water by two bore well pumps, then it is pumped to DM plant for DM water generation, potable water for drinking water and cooling water make-up.

Water Consumption and Balancing is given below:

Table 8: Water Consumption and Balancing (DM Plant)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr)	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (near TG Building)	148	10.00	1	61.6	1480		
2	Bore well Pump - 2 (near UGR)	141	15.75	1	92.5	2221		
1	Total Inflow of Raw water Make-up (1+2).				154.2	3701		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	34	1.0	1	1.4	34		
	Inflow of DM plant				1.4	34		.
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	10	2.5	1	1	24		
2.2	N-pit Pump (CT blowdown line to ETP inlet)	48	0.2	1	0.4	9.6		
	Outflow of DM plant (2.1+2.2)				1	34		
	Difference				0.02	0.40		Storage in Degasser tank.

Table 9: Assessment of Water Pumps Performance

Particulars	Unit	Bore well Pump - 1 (22 kW, Near TG Building)	Bore well Pump – 2 (22 kW, Near UGR)
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	22	22
Rated Voltage	V	415	415
Full Load Amps	A	44	44
Efficiency (η)	%	85	85
Speed	RPM	2850	2850
Pump			
Head	m	25	25
Water flow rate	m^3/hr	180	180
Efficiency (η)	%	-	-
Speed	rpm	2895	2895
Measured Parameters			
Suction pressure	kg/cm^2	0.0	0.0
Discharge pressure	kg/cm^2	2.5	2.5
Water flow rate	m^3/hr	148	141
Power input	kW	22	21
Motor Efficiency (estimated)	%	80	80
Calculation			
Suction head	m	0	0
Discharge head	m	25	25
Total head	m	25	25
Water flow rate	m^3/s	0.041	0.039
Density of water	kg/m^3	1000	1000
Hydraulic power	kW	10.08	9.61
Shaft power	kW	17.57	17.09
System efficiency	%	45.90	44.97
Pump efficiency	%	57%	56%
% loading of flow	%	82%	78%
% loading of head	%	100%	100%
% Motor loading	%	85%	83%
SEC (kWh/m3)		0.15	0.15

2.5 Effluent Treatment Plant (ETP) and Underground reservoir (UGR) tank

Cooling tower blow down and "N" pit water are sent to ETP for treatment and after treatment the clean water is pumped into the UGR tank. UGR water is used for:

1. Horticulture water;
2. Ash water;
3. Service water and
4. Fire water

Table 10: Water Consumption and Balancing (ETP &UGR Tank)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT blowdown + 'N' pit)	48	6.2	1	12.3	295		
1.2	CT blowdown					285.60		
	Inflow of ETP				12.3	295		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter feed pump)	34	8.5	1	12	289		
	Outflow of ETP				12	289		
	Difference				0.26	6.2		Storage in equalization tank
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				12	289		
	Inflow of UGR				12	289		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Water is used to horticulture + Ash Water + Service Water + Ash yard				9	217		
	Outflow of				9	217		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	UGR							
	Difference				3.01	72.25		Storage in UGR tank for to be utilized under plant shutdown condition.

2.6 Circulating Water (CW) Pumps, Auxiliary Cooling Water (ACW) Pumps and Auxiliary Cooling Water (ACW) Booster Pumps

CW pumps and ACW pumps supply water from cooling tower cold basin to the condenser from where the return water is sent to cooling tower. There are three CW pumps, of which one pump is in operation during study period (at 55% loading) and each CW Pump capacity is of 8600 m^3/hr.

There are two ACW booster pumps provided for each unit to meet the auxiliary equipment cooling requirements, of which generally one pump is in operation during study period (at 55% loading). These pumps take suction from condenser cooling water inlet header and after heat exchange duty the water is returned to condenser cooling water outlet header.

Operational schedule of the CW pumps, ACW pumps and CW booster pumps at different unit loading condition:

- At partial load (55%) = 1 CWP + 1 ACW Booster pump are in operation.
- At full load (100%) = 2 CWPs +1 ACW Booster pump are in operation.

Water distribution circuit diagram is given below:

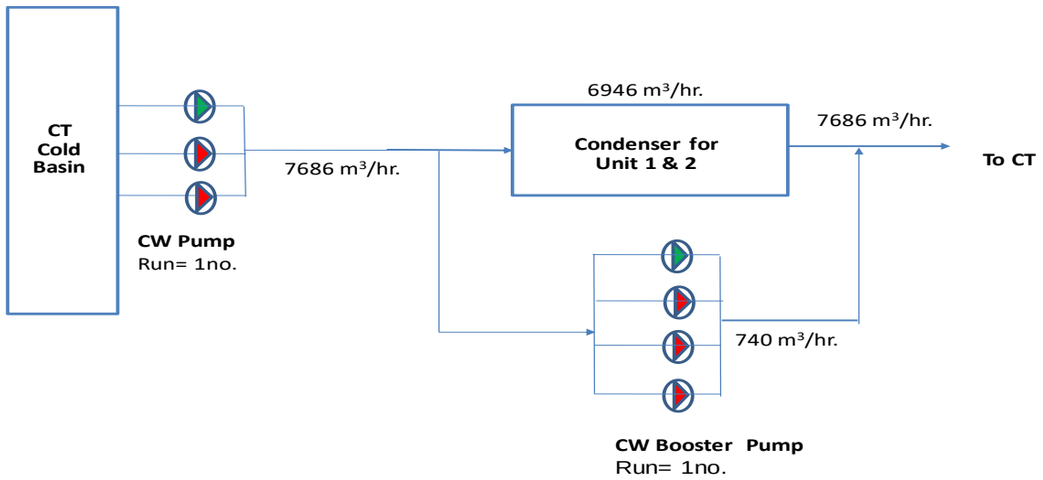


Table 11: Water Consumption and Balancing (CW & ACW System)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m³/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m³/hr) (@24hrs / day).	Avg. Flow (m³/day)	Remarks
1	**Cooling Water (CW) System**					
1.1	CW Pump-1	7686	24	7686	184464	* 1 CWP + 1 ACW booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW. * 2 CWPs + 1 ACW booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1.2	CW Pump-1 + CWP-2	13850	24	13850	332400	
1.3	CW Pump-1 + CWP-3	13600	24	13600	326400	
1a	Total Cooling water flow at partial load (55%).			7686	184464	* 1 CWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
1b	Total Cooling water flow at full load (100%).			13725	329400	* 2 CWPs + 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1	**ACW Booster Pumping System**					
1.1	ACW Booster Pump 2 (U#1)	740	24	740	17760	*1 ACW Booster pump is run at partial load (55%) = 55% x 2x45MW = 49.5MW. * 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	Avg. of ACW Booster pump	740	24	740	17760	
	CW Flow to Condenser (by calculation)					
1	CW flow to Condenser at partial load (55%) = 55% x 2x45MW = 49.5MW.	6946	24	6946	166704	* 1 CWP - 1 ACW Booster Pumps are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
2	CW flow to Condenser at full load (100%) = 100% x 2x45MW = 90MW.	12985	24	12985	311640	* 2 CWPs - 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.

Table 12: Assessment of Water Pumps Performance

Particulars	Unit	CW Pump 1 (One pump running)	ACW Booster Pump - 2 (Unit#1)
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	700	55
Rated Voltage	V	11000	415
Full Load Amps	A	46.7	96
Efficiency (η)	%	92	93
Speed	RPM	745	1470
Pump			
Head	m	23.16	25
Water flow rate	m^3/hr	8600	500
Efficiency (η)	%	85	-
Speed	rpm	745	1470
Measured Parameters			
Suction pressure	kg/cm^2	0.0	0.9
Discharge pressure	kg/cm^2	1.5	2.0
Water flow rate	m^3/hr	7686	740
Power input	kW	513	50
Motor Efficiency (estimated)	%	90	85
Calculation			
Suction head	m	0	9
Discharge head	m	15	20.1
Total head	m	15	11.1
Water flow rate	m^3/s	2.135	0.206

Particulars	Unit	CW Pump 1 (One pump running)	ACW Booster Pump - 2 (Unit#1)
		Pump	Pump
Density of water	kg/m³	1000	1000
Hydraulic power	kW	314.17	22.38
Shaft power	kW	462.03	42.77
System efficiency	%	61.20	44.48
Pump efficiency	%	68%	52%
% loading of flow	%	89%	148%
% loading of head	%	65%	44%
% Motor loading	%	67%	85%
SEC (kWh/m³)		0.07	0.07

Analysis and observation

1. **Circulating Water (CW) Pump 1 (only one pump run):** Pump efficiency (68%) is found to be below as compared to design value 85%. The operational factors influencing efficiency variation is felt to have lower loading on flow and lower loading on head.
2. **Unit#1, ACW Booster Pump 2:** Pump efficiency (52%)is found to be very much below as compared to design value 85%. The operational factors influencing efficiency variation is felt to have higher loading on flow and lower loading on head.

2.7 Cooling Tower System

Performance Evaluation of Cooling Tower at partial loading (55%) is given below:

Table 13: Performance Evaluation of Cooling Tower

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
	Cooling Tower (CT) System					
1	Unit Load	MW	25	25	49.9	At NCR 45MW as per design.
	% of NCR	%	56%	55%	55%	
2	CW flow	m³/hr	7686		7686	
3	CW inlet water temperature	°C	33	32.97	33	
4	CW outlet water temperature	°C	43	43.44	43	
5	Temperature difference	°C	10	10	10	10°C as design.
6	DBT at ambient	°C			32	
7	WBT at ambient	°C			28	
8	C.O.C				5.5	
9	Evaporation loss	m³/hr			122	

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
		%			1.59%	As per design 1.67%.
10	Blow down as per calculation	m^3/hr			27	
10a	Blow down as per measurement	m^3/hr			12	
11	Total CT make-up as per calculation	m^3/hr			149	
12	Range	^oC			10	
13	Approach	^oC			4.97	4^oC as per design
14	Effectiveness				0.68	

2.8 Condenser System

Performance Evaluation of Condenser System at partial loading (49%) is given below:

Table 14: Performance Evaluation of Condenser System

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Condenser System					
1	Unit Load	MW	25	25	50	At NCR 45MW as per design.
	% of NCR	%	56%	55%	55%	
2	CW flow of condenser (by calculated)	m^3/hr	6946		6946	
3	CW inlet water temperature	^oC	33	32.97	33	32^oC as design.
4	CW outlet water temperature	^oC	43	43.44	43	42^oC as design.
5	Temperature difference	^oC	10	10	10	10^oC as design.
6	Condenser Thermal Load as run condition	million kCal/hr			72	.

3 Environmental Compliances Related to Water

Being a reputed thermal power generating company of Uttar Pradesh state, Khamberkhera Unit of Bajaj Energy Limited (BEL) always makes it a point to fulfil the environmental compliances as per the guidelines given by **Central Ground Water Authority(CGWA)** and **Uttar Pradesh Pollution Control Board (UPPCB)**.

Table 15: Compliances related to Water

Sl. No.	Condition	Status/ Compliance	Remarks
1	The plant may extract 6,984 m3/day (≤20,95,850m3/year) with two existing bore wells.	The plant is maintaining the water withdrawal limit	Checked during visit
2	Digital Meters must be installed at each bore well and log book must be maintained	Digital meters are installed for both bore well and log book is maintained	
3	Ground water level monitoring through existing piezometers.	Plant is continue monitoring the ground water level	Ground water level data for last one year is enclosed at-Annexure-I
4	Recycling and reuse of waste water	Complied	-

Water Saving Potential at Bajaj energy units of having capacity (2 x 45 MW each)		
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m^3/MWH.		
While as per CGWA NOC BEL plants are entitled for daily ground water withdrawal of 6984 m^3/day which is equivalent to 3.23 m^3/MWH at station full load running condition. This withdrawal limit is already less than MOEF norms		
Recently CGWA has issued guideline dated 24 sept 2020 which states as following "All industries abstracting ground water in excess of 100 m^3/day shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means. "		
Therefore we have worked out the maximum water saving potential in all BEL stations and also worked out best specific water consumption which can be achieved by BEL stations		
Specific water consumption As per MOEF (m^3/MWH)	3.50	
Approved water quantity per day by CGWA(m^3/day)	6984	
Specific water consumption As per CGWA Approved water quantity (m^3/MWH)	3.23	
A. Water consumption Break up at full load at COC-7	Quantity (m3)	Remarks
Evaporation Loss (m^3/Day)	5914	

Drift Loss (m^3/Day)	6	
COC	7	
Blow Down loss(m^3/Day)	986	
Cooling Tower Make up(m^3/Day)	6906	
Potable Water Quantity (m^3/day)	10	
Evaporation loss from water reservoir (m^3/day)	3	
DM Plant Make up(m3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	6984	
Horticulture (m^3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (m3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption

B) Saving Potential at Full Load Condition

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 591 M3 Water may be utilised as CT Make up

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	591	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(m3/Day)	6314	
DM Plant Make up(M3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (m3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (m3/Day)	50	
Total Bore well water required(m3/day)	6443	
Water saving from approved Quantity (m^3/day)	541	
% Water Saving from approved Quantity)	7.8%	

Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9

Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	5914	
Drift Loss (M3/Day)	6	
COC	9	

Blow Down loss(M3/Day)	739	
Water Being used as CT make up from UF RO System(70% recovery)	517	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	6142	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	6270	
Water saving from approved Quantity (M3/Day)	714	
% Water Saving from approved Quantity	10.2%	
Maximum Possible water saving is 10.20%		

We have also worked water saving potential at 80% Loading factor.		
Specific water consumption As per MOEF (M3/MWH)	3.50	
Proportionate water quantity at 80% Loading Factor per day(m3/day)	5587	80% quantity
Specific water consumption As per CGWA Approved water quantity (M3/MWH)	3.23	
C. Water consumption Break up at 80% load at COC-7	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	7	
Blow Down loss(M3/Day)	789	
Cooling Tower Make up(M3/Day)	5525	
Potable Water Quantity (m3/day)	10	
Evaporation loss from water reservoir (m3/day)	3	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	5603	
Horticulture (M3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (M3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption
D) Saving Potential at 80% Load Condition		
Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7		

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 414 M3 Water may be utilised as CT Make up		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	473	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	5052	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5180	
Water saving from approved Quantity (M3/Day)	407	
% Water Saving from approved Quantity)	7.3%	
Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9		
Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	9	
Blow Down loss(M3/Day)	591	
Water Being used as CT make up from UF RO System(70% recovery)	414	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	4914	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5042	
Water saving from approved Quantity (M3/Day)	545	
% Water Saving from approved Quantity	9.8%	

% Water Saving from approved Quantity : 9.8%	

Conclusion: It is seen from the above working that 20% reduction target is difficult to achieve in thermal power plants.

Apart from the above, plant will take up annual water audit exercise, adopt measures to reduce fresh water consumption, monitor ground water and will submit relevant data to the concerned authority.

Table 16: Plant Production and Consumption Details

Sl. No.	Description	2019-20 (July, 2019-June, 2020)
1	Total Power Generation (MWh)	60055
2	Total Raw Water Consumption (m3)	183673
3	Specific Raw Water Consumption (m3/MWh)	3.06

Table 17: Treated Water Parameters

Sl. No.	Location	Parameter	Unit	Actual Value	CPCB Standard Value (Inland Surface Water)
1	ETP I/L	pH	-	6.98	-
2		Total Suspended Solid (TSS)	mg/l	124	-
3		Bio-chemical Oxygen Demand (BOD)	mg/l	73	-
4		Chemical Oxygen Demand (COD)	mg/l	365	-
6	ETP O/L	pH	-	7.42	5.0-9.0
7		Total Suspended Solid (TSS)	mg/l	28	100
8		Bio-chemical Oxygen Demand (BOD)	mg/l	15	30
9		Chemical Oxygen Demand (COD)	mg/l	62	250

Sample collected on 15/06/2020 by third party. Testing was conducted by third party.

Table 18: Ground Water Parameters

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
1	Colour	HZN	<5.0	5 max	15 max
2	Odour	-	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1.0	1 max	5 max
5	pH	-	7.26	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	128	200 max	600 max
7	Iron (Fe)	mg/L	0.21	0.3 max	No Relaxation
8	Chloride (Cl)	mg/L	42	250 max	1000 max
9	Residual Free Chlorine	mg/L	<0.2	0.2 min	1
10	Sulphates (SO_4)	mg/L	39	200 max	400 max
11	Total Alkalinity	mg/L	143	200 max	600 max

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
12	Fluoride (F)	mg/L	0.22	1.0 max	1.5 max
13	Total Dissolved Solid (TDS)	mg/L	349	500 max	2000 max
14	Total Coliform	MPN/100ml	Not Detected	-	-
15	E coli	/100ml	Not Detected	-	-

*as per IS 10500

Sample collected on 14/06/2020 by third party. Testing was conducted by third party.

From the above tables, it is evident that the plant is complying with the relevant parameters mentioned by CGWA and UPPCB.

4 Water and Energy Conservation Options

4.1 RECOMMENDATION – 1: Pump Efficiency Improvement of Circulating Water Pump -1 by overhauling and operating near design flow and head

Present Scenario

As a part of the water audit study, operating performance of the CW pump 1was assessed by measuring different parameters, like flow, pressure & corresponding power input to the drive motor. It was observed that the said pump was operating with low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumpto be operate near design flow and head, effecting the pump efficiency inprove.

Table 19: Cost Benefit Analysis for Recommendation 1

Item Ref	Unit	Circulating Water (CW) Pump - 1
Present Condition:		
No of pumps operation	No	1
Motor input (Avg.)	KW	513.36
Water flow (Avg.)	m3/hr	7686
Total Head Dev (THD) (Avg.)	mWC	15
Liquid kW / Pump shaft power (Avg.)	KW	314.165
System Efficiency (Pump & motor) (Avg.)	%	61.20%
Proposed Condition:		
Pump Efficiency under proposed condition (Avg.)	%	70
Motor efficiency (assume)	%	90
Proposed system Efficiency (Pump & motor)	%	63
Motor input (pump set)	KW	498.68
Power savings of each pump	KW	14.69
Annual Hrs. operation (considering 24 Hrs. running at partial load @60%)	Hrs/Yr	2400
Envisaged reduction in annual energy consumption in the pump drives.	kWh	35255
	MU/Yr	0.035
Unit selling Price	INR/kWh	3.25
Annual Energy Cost savings potential	INR in Lakhs	1.15
Investment for Overhauling	INR in Lakhs	3
Simple Pay Back Period	Yrs	2.62

5 Rain Water Harvesting

5.1 Rain Water Harvesting Programme

Rain Water Harvesting, is an age-old system of collection of rainwater for future use. But systematic collection and recharging of ground water, is a recent development and is gaining importance as one of the most feasible and easy to implement remedy to restore the hydrological imbalance and prevent a crisis. Rain water harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later. Rooftop rainwater harvesting: Rooftop rainwater from the administrative office area, factory area and other plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells.

The recharge wells will be provided with recharge bores to facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside the recharge well ensure efficient filtration. In addition to this Rain water harvesting and groundwater recharge structures will also be constructed outside the plant premises to augment the ground water level.

In scientific terms, water harvesting refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage and all other hydrological studies and engineering inventions, aimed at conservation and efficient utilization of the limited water endowment of physiographic unit such as a watershed. Rain is a primary source of water for all of us. There are two main techniques of rainwater harvesting:

- Storage of rainwater on surface for future use
- Recharge to groundwater

Directly collected rainwater can be stored for direct use or can be recharged into the groundwater. All the secondary sources of water like rivers, lakes and groundwater are entirely dependent on rain as a primary source. Rainwater harvesting structures shall be provided to recharge the groundwater resources in the region. The run-off water from the roof of the structures and paved areas shall be collected through storm water drainage system and led to rain water harvesting structure.

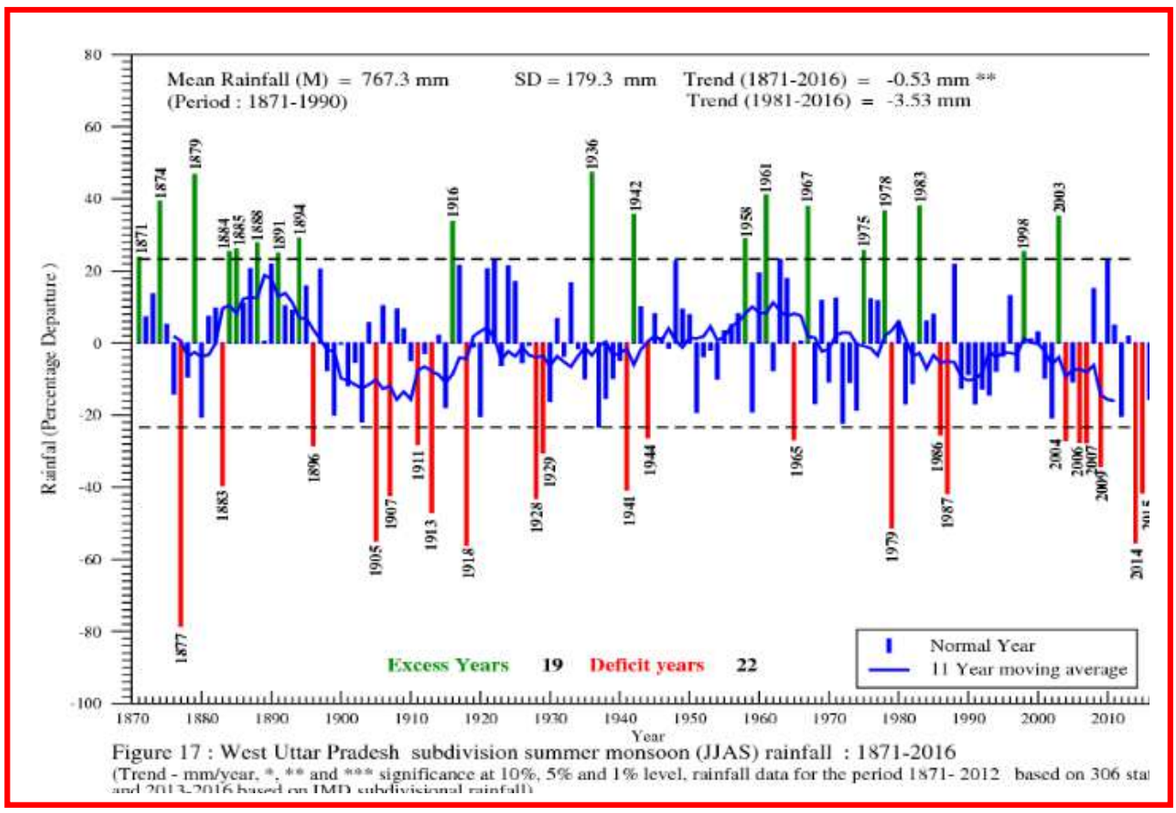


Figure 17 : West Uttar Pradesh subdivision summer monsoon (JJAS) rainfall : 1871-2016
(Trend - mm/year, *, ** and *** significance at 10%, 5% and 1% level, rainfall data for the period 1871- 2012 based on 306 stat

Annual Rain Fall	***767.3 mm (West UP)***

5.2 Rainwater Harvesting Facilities

For augmenting the ground water resources in the plant premises, number of rainwater harvesting pits will be constructed and the internal drains where excess rain water flowing in drain will be diverted to these pits. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. The roof top water will be routed to the storm drains. This will result in increase in groundwater tables and to some extent the improvement of ground water quality.

Rainwater Harvesting in Khambarkhera unit will be very useful. With respect to the physical alternatives to fulfil sustainable management of freshwater, there are two solutions - first reuse the rainwater at washroom, gardening and the second is for ground water recharge.

The size and the locations of rainwater harvesting pits will be decided during detailed engineering of the project.

Run off from the proposed project site is calculated using rational formula:

$$Q = C \times I \times A$$

Q = Run-off in m3/hr

A = Catchment Area (Sq.m)

C = Coefficient of Run-off

I = intensity of Rainfall in mm/yr

5.3 Rain Water Harvesting Potential Calculation

Table 20: Rainfall Data

Particulars	Unit	Values
Intensity of rainfall (in mm) based on IMD Data	mm/yr	767.3
No. of rainy days		48
Rainfall per day	mm/day	15.985
	m/day	0.0160

Table 21: Roof Top Area

Roof Top Area											
Description	Unit	Values									
		TG Building	Deaerator Floor	Stores	Switchyard control room	DM Plant MCC & Lab	ESP Control room	CHP Control room	UGR MCC	Boiler roof	Unit Panel Room
Drainage area in m2	m2	2170	860	345	84	120	250	160	60	500	60
Coefficient of run-off	-	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Runoff	m3/day	29.485	11.685	4.688	1.141	1.631	3.397	2.174	0.815	6.794	0.815
Total runoff	m3/day	62.625									

Table 22: Storage Potential*

Location	Unit	*Values
TG Building	m3/day	11.79
Deaerator Floor	m3/day	4.67
Stores	m3/day	1.88
Switchyard control room	m3/day	0.46
DM Plant MCC & Lab	m3/day	0.65
ESP Control room	m3/day	1.36
CHP Control room	m3/day	0.87
UGR MCC	m3/day	0.33
Boiler roof	m3/day	2.72
Unit Panel Room	m3/day	0.33
Total	**m3/day**	**25.05**

Considering collection efficiency to be 40%

5.4 Recommendation for use of rain water

- The collected rain water can be pumped to a combined filtration system for removal of suspended solids and other impurities. Sand filter and activated carbon filter can be installed for filtration of rainwater before reuse.

- The following overarching goals apply to the implementation of rain water harvesting and reuse systems:
  - ✓ Reduction of rain water pollutant loads and flows to surface waters, helping achieve local rain water management requirements;
  - ✓ Reduction of the demand on potable water sources; and
  - ✓ Reduction of stress on the existing water supply infrastructure.
- Additionally, rain water harvesting and reuse systems can be used to help achieve Leadership in Energy and Environmental Design (LEED) and other sustainable design credits related to rain water quantity and quality as well as water efficiency.
- Although rain water harvesting and reuse systems appear to be a viable alternative to help achieve required rain water management standards as well as reducing the demand on the potable water supply, they are not without concerns. Concerns include human exposure to pathogens, cross-contamination of the potable water supply and exposure due to ingestion of crops potentially contaminate harvested rainwater for bacteriological parameters and other organic load before reuse in processes.

6 Motor Load Survey

Table 23: Motor Load Survey

Borewell pump - 1 (Near TG)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	22.0	415	43	-	408	38.03	0.82	21.97	93
Borewell pump - 2 (Near UGR)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	22.0	415	43	-	407	34.43	0.88	21.36	90.20
N-Pit Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	86	424	9.90	0.66	4.82	55.30
CW Pump - 1 (Only one pump running)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11073	35.50	0.75	513.36	69.45
ACW Booster Pump -2 (U#1)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	93	427	84.00	0.81	50.32	85.09
CW Pump - 1 (CWP 1 and 2 running)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11150	38.80	0.77	576.96	78.05
CW Pump - 2 (CWP 1 and 2 running)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11380	39.90	0.80	625.22	84.58
CW Pump - 1 (CWP 1 and 3 running)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11060	38.90	0.77	573.78	77.62

CW Pump - 3 (CWP 1 and 3 running)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	92	11150	38.80	0.77	576.96	75.83
Filter Water Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	86	408	12.40	0.70	6.13	70.33

7 Checklist For Self-Assessment For Determining Water Efficiency For Facility Managers

Sl. No.	Activities	Descriptions	Frequency
1	Monitoring of cycle of concentration	Cooling towers are normally designed for a COC of 5 with requirement of makeup water typically about 2.1% of water flow (comprising of 1.7% evaporation loss, 0.05% drift loss and 0.35% as blow down). By increasing the COC, the blow down quantity can be reduced by external water treatment and adding water treatment chemicals, COC of even 10 can be reached. Increasing COC can result in significant savings of water as the blow down will be further reduced by suitably improving the chemical regime of circulating water, if feasible	Weekly
2	Monitoring of leaks and overflows	Leakages from valves, taps, fire fighting hoses, underground fire fighting lines, cooling tower basin, gardening hoses area also a source of water loss. There lies a possibility of reducing the water consumption by plugging the leakages. For every litre of water lost in a water network, another litre of water has to be treated and pumped through the distribution network to compensate.	Weekly
3	Installation of Pressure Gauges and Monitoring	In both the suction and discharge side of the circulating pumps. If the gauge indicates the pressure (or pressure drop) in the process, that information is valuable only if one can do something about it like cleaning a filter.	Daily
4	Calibration of Water flow meters	Annual Calibration of all the water flow meters and pressure gauges must be ensured. A calibrated instruments ensures that the measurements and readings taken are authentic and hence can be used for reference for other study very easily	Annual
5	Operational hours of the circulating pumps to be monitored	In the log book on a continuous basis. Inclusion of operational hours in the log book keeps a track record of the running hours of individual pumps and hence is helpful to optimize the pumping operations if required.	Daily
6	Water quality test report of the Cooling Tower basin	To be conducted in shift-wise. This is important to ensure that COC of the cooling tower is maintained at the desired level to reduce the cooling tower blow down.	Shift wise
7	Maintenance of log book of the cooling tower make up water flow and soft plant water flow	A log book of the cooling tower make up water flow and soft plant water flow In the cooling tower to be maintained. Soft water being a costly water should be monitored along with the makeup water for cooling tower.	Daily
8	Monitoring the	Determining whether discharge from any one operation can be	Daily

Sl. No.	Activities	Descriptions	Frequency
	amount of discharge water	substituted for fresh water supply to another operations. In many cases, where water quality is not much of significance but is only used for washing and cooling purposes, the use of discharge water is recommended over fresh water.	
9	Reuse of wastewater after treatment	Handling waste materials in a dry mode wherever possible. Use of even waste water should be minimized as far as possible.	Daily
10	Monitoring of raw water consumption	Reduction in water consumption in processes by closely monitoring of timings of processes and water circulation.	Daily
11	Monitoring of Rainwater collected in reservoir/ pond	Collection of rain water from factory premises to reservoir / ponds for future use to reduce the raw water intake	Daily

Annexure-I

Ground Water Monitoring data for BEL Khamberkhera Unit is given below:

Period	Average Ground Water Level (m)
July, 2019	3.74
Aug, 2019	3.44
Sep, 2019	3.27
Oct, 2019	3.20
Nov, 2019	3.21
Dec, 2019	3.15
Feb, 2020	3.01
Mar, 2020	3.00
Apr, 2020	3.32
May, 2020	3.54
June, 2020	3.68
July, 2020	3.64

Benchmarks

The flowing table presents the Water Consumption Norms of few countries and water consumption levels of some of major Thermal Power Plants in the country:

S No	Reference	Norm
1.	USA (*Source: National Renewable Energy Laboratory Report on Consumptive Water Use for US power Production*)	1.8 Ltrs/kWh
2.	South Africa (*Source: MIT Report on Water Footprint of Electric Power Generation*)	2.02 Ltrs/kWh
3.	National Norm for 500MW Indigenous Coal Based Plant with wet Cooling Tower (*Source: CEA Report minimization of water requirement in coal based Thermal Power station*)	3.0 ltr/kWh
4	National Norm 660MW Coal Based Super Thermal Power plant with ash water recycling (*Source: FICCI Bulletin on Energy Efficiency 2006*)	3.0 -4.0 m3/MW
5	National Norm 660MW Coal Based Super Thermal Power plant without ash water recycling. (*Source: FICCI Bulletin on Energy Efficiency 2006*)	4.0 -4.5 m3/MW
6	Water Consumption in Some of the Power plant in India (Source of data: Declared by the plant)	
(a)	Vidhyachal Stage I (6 X 210MW) (Raw water consumption is 4000m3/hr with AWRS in operation).	3.17m3/MW
(b)	Vidhyachal Stage II (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(c)	Vidhyachal Stage III (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(d)	Rihand thermal Power Station-Stage I & II(2 X 500MW + 2 X 500 MW) with AWRS in operation	3.21

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Report

on

Water Audit Study

at

Bajaj Energy Limited

(Kundarki Unit)

Submitted to

Bajaj Energy Limited

Kundarki Unit

Vill.-Kundarki, Tehsil – Gonda, District – Gonda

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National Productivity Council

Water Audit Team

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Executive Summary

As part of on-going efforts to reduce Water Consumption, the progressive management of Bajaj Energy Limited approached NPC to carry out the Water Balance study of its 5 plants in Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur). The study is intended to be a Detailed Water audit study of the above Plants regarding their existing operating status of water use and suggesting relevant water conservation measures to be adopted to bring down the water consumption in the plant.

As a result, NPC team has carried out the field visit for water audit study at 5 Power Plants of Bajaj Energy Limited in July 2020. Available data pertaining to various key parameters were collected from the concerned officials. The necessary field measurements were carried out during the field study for assessing the existing water use scenario and to identify the water conservation measures. The report has been prepared for Kundarki Plant based on the data/information collected/measurement taken by the NPC team and observations made during the field study are discussed in this report.

The following recommendations and findings made as per the observation of the study team.

Water Usage Scenario

The source of water is from two numbers of borewell pumps installed in the plant.

Specific water consumption is established on the basis of historical data collected from the plant and the same is tabulated below:

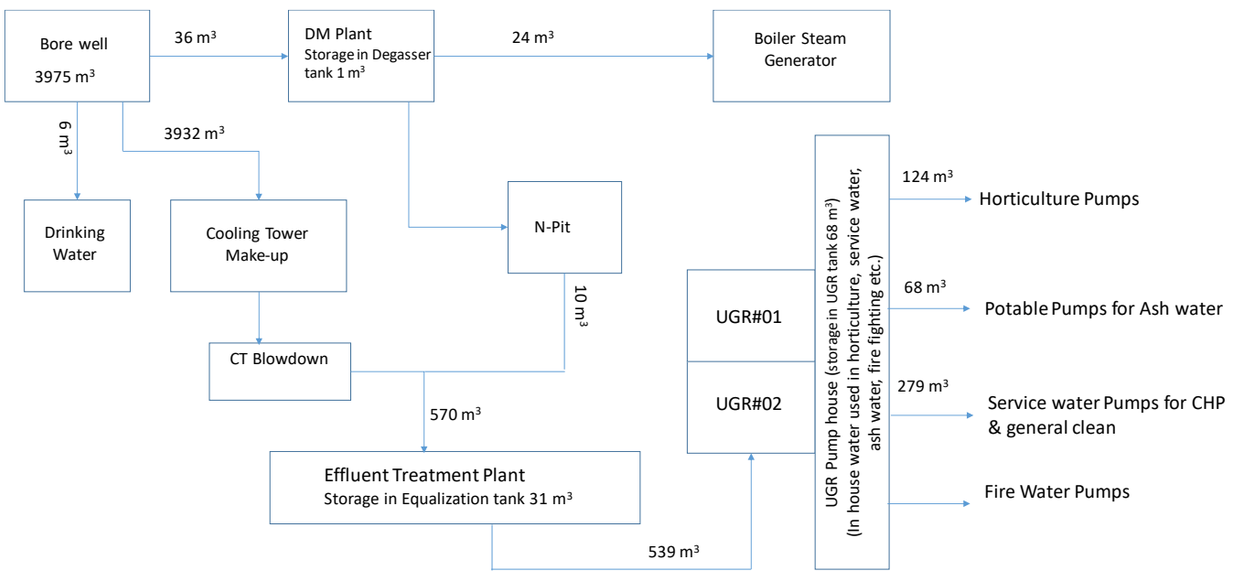
Table 1: Specific Water Consumption

Particulars	Unit	Value	Standard
Annual Generation of 2 units (@45MW)*(1st June 2019 to 31st May 2020)*	MU	80.097	• Standard Specific water consumption = 3.5 m^3/MWh.(as per MOEF notification dated 7th Dec'15)
Annual water consumption *(1st June 2019 to 31st May 2020)*	m^3	270905	
Specific water consumption (m^3/MWh)	m^3/MWh	3.38	

**Period: 1st June 2019 to 31st May 2020.*

** Standard values for close loop circuit system.*

Actual measurement of Total water distribution on particular day at different usage areas is illustrated in the diagram below:


Bore well
3975 m³
36 m³
DM Plant
Storage in Degasser tank 1 m³
24 m³
Boiler Steam Generator
6 m³
3932 m³
Drinking Water
Cooling Tower Make-up
N-Pit
10 m³
CT Blowdown
570 m³
Effluent Treatment Plant
Storage in Equalization tank 31 m³
539 m³
UGR#01
UGR#02
UGR Pump house (storage in UGR tank 68 m³)
(In house water used in horticulture, service water, ash water, fire fighting etc.)
124 m³
Horticulture Pumps
68 m³
Potable Pumps for Ash water
279 m³
Service water Pumps for CHP & general clean
Fire Water Pumps

Water Consumption & Water Balancing

Water consumption at different sections of the plant is given below:

Table 2: Daily Water Consumption

Overall Water Balance Summary:

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	**Total inflow**	**165.60**	**3974.50**	
2	**Total outflow**			
2.1	DM plant inlet	1.49	35.75	
2.2	Drinking water	0.25	6.00	
2.3	CT make-up {1.1 - (2.1+2.2)}	163.86	3932.75	
	Total outflow	**165.60**	**3974.50**	

Bore well water pumps to DM Plant:

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr)	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Borewell Pump - 1 (at near DM plant)	143	17.00	1	101	2431		
2	Borewell Pump - 2 (at near shop)	147	10.50	1	64	1543.5		
3	Total Inflow of Raw water Make-up (1+2).				166	3975		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	65	0.55	1	1.49	35.75		
	Inflow of DM plant				**1.5**	**36**		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	8	2.9	1	1	24		
2.2	N-pit Pump (CT blowdown line to ETP inlet)	67	0.2	1	0.42	10.05		
2.1.1	DM Transfer Pump - 1	27	0.9	1	1	24		VFD install
	Outflow of DM plant (2.1+2.2)				1.4	34		
	Difference				0.07	1.71		Storage in Degasser

Effluent Treatment Plant (ETP) and Underground reservoir (UGR)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs. per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr.) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT blowdown riser 1&4)	114	5.0	1	24	570		
	Inflow of ETP				**24**	**570**		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter feed pump)	49	11	1	22	539		
	Outflow of ETP				**22**	**539**		
	Difference				**1.29**	**31.00**		Storage in equalization tank.
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				22	539		
	Inflow of UGR				22	539		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Horticulture Pump	19	6.5	1	5	124		
2.2	Potable Pump for Ash water	34	2.0	1	3	68		
2.3	Service Water	93	3.0	1	12	279		
	Outflow of UGR				20	471		
	Difference				2.85	68.50		Storage in UGR tank & losses.

Summary of Recommendations

Water Balance Study by NPC at BEL Kundarki plant has identified saving potential of **0.19MU/year** of Energy and **INR6.04Lakhs/year** of monetary savings. It is suggested that Kundarki plant may prioritise below mentioned Water& Energy conservation measures and commence implementation at the earliest. It is the responsibility of the plant personnel to confirm with safety and other statutory requirements before implementing the proposed water and energy conservation measures.

Summary of Water and Energy Conservation measures identified at Kundarkiplant is shown below:

Sr. No	Particulars	Annual savings potential		Investment (INR in Laks)	Simple payback period (Yrs.)
		Energy	Monitory		
		MU/yr.	INR in Lakhs		
1	Install Energy Efficient Bore well pump set with VFD Drive	0.074	2.41	10.00	4.15
2	Pump Efficiency Improvement by Overhauling of CW pump -2	0.112	3.63	3.00	0.83
	Total	**0.19**	**6.04**	**13.00**	**2.15**

General Observations and Recommendations:

- Install Pre-treatment plant & Post-treatment plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.
- Replacement of Underperforming Pumps of "N" pit pump, Potable pump, Service Water Pump and Filter Feed Pump (at ETP) by Energy Efficient Pumps and Motors with VFD drive.
- Stop ACW water flow (12m3/hr) for Ash hopper jacket cooling. This amount of water for Ash hopper jacket cooling can be sourced from potable pump (UGR tank).
- Pump Efficiency to be improved by Overhauling of ACW pump 2.
- Dust suppression (DS) pumps are in operation during summer season only.
- Avoid overflows of water storage tanks by installing float-controlled valve at drinking water overhead storage tanks.
- Manage pressure in the system to ensure that optimal levels are maintained in the tanks. High pressure causes wear and tear on the system causing new leaks and increasing loss rates.
- Repair installed meters at different areas or zones to monitor flow rates. Manage metered data by setting flow rate thresholds. When exceeded, it indicates possible system leaks.
- To carry out regular inspection of nozzles for clogging and leak and repair the detected leaks;
- Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow.
- Turning off all water flows during shutdowns unless they are essential for cleanup. To use solenoid valves to stop water flow when production stops (valves can be activated by connecting them to drive motor controls).

- Adjust pump cooling and water flushing to the minimum required level. Sharing of information with employees on water usage procedure and amount of water used for each application is recommended. This would promote how employee actions can reduce water usage.
- Place signs and placards near new equipment, making it easy to understand new technology and how to use it properly.

1. Introduction

1.1 Background

Water is one of the key input requirements for thermal power generation. Water is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.

Water is used in almost all areas/ facilities of thermal power stations in one way or other. A typical list of plant systems/ applications requiring consumptive water is indicated as below:

i) Cooling water system for condenser & plant auxiliaries

ii) Power cycle make up

iii) Equipment cooling system

iv) Air conditioning and ventilation system

v) Coal dust suppression system

vi) Service water system

vii) Potable water system

viii) Gardening

ix) Evaporation from raw water reservoir

Difficulties are already being faced in existing thermal power plants due to non-availability of water. This problem is expected to be aggravated in future when more sites would be required. Thus there is a need to minimize consumptive water requirement for thermal power plants. Optimization/ minimization of plant consumptive water includes measures such as judicious utilization of water in different applications, adoption of reduced margins in various consumptive uses, adequate treatment for deteriorating quality of raw water, use of plant waste waters in various low grade applications and recycling of plant waste waters to maximum extent.

Water audit is an important management tool for effective conservation of water. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one is consumption audit on demand side. Water audit in the plant is conducted to identify supplied water quantity, water usage, losses, water quality, identify and priorities areas which need immediate attention for control, raise awareness on monitoring water consumption and to provide suggestions for effective water conservation.

The broad area of scope of work includes performance assessment of raw water sources & existing storage systems, estimation of present water consumption, water balance across the entire system, assessment of water consumption per unit generation, water quality management plan, measures of improving efficiency of water utility networks and also to enhance operational efficiency through controls.

1.2 About the Project

BEL, as part of their energy efficiency and resource conservation endeavours, had initiated the process of Auditing of significant systems/subsystems on a regular basis, with a view of achieving resource consumption optimization and continuous improvement. As a part of it, the management of BEL approached National Productivity Council (NPC), Delhi, to conduct the "Water Audit Study of five of its plants located in the state of Uttar Pradesh. Onsite measurements for the above stated Water Audit Study was carried out during the month of July 2020.

This report provides details about the scope, methodology, measurements, water balance of individual subsystems and overall plant, findings and recommendations of the water balance study of Kundarki plant.

1.3 Objectives and Scope of the Study

The broad objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

The scope of the water audit study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
  - Raw water
  - DM water
  - Circulating water
  - Waste water

- To develop norms for in-house water consumption and use in terms of m3/MWh for monitoring and targeting.
- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.
- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (wherever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:

  ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.

  ✓ Laboratory testing & analysis reports for key parameters.

1.4 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Kundarki plant.

➢ Direct measurement-Using Ultrasonic Flow meter for clear water

➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
- Electrical measurements were carried out by using 3 phase Power Analyser.

- Standard pressure gauges were used for monitoring suction &discharge pressures of pumps.

1.5 Instruments used

- Ultrasonic Water Flow Meter
- 3-phase power analyser

1.6 About Bajaj Energy Limited

Bajaj Energy limited (BEL) is one of the largest private sector thermal generation companies in Uttar Pradesh and is involved in developing and operating thermal power plants in India. BEL has a total installed capacity of comprising 45 MW from five operational plants of 90 MW each owned and managed by Bajaj Energy Limited (BEL), spread across the state of Uttar Pradesh.

BEL has entered into long-term fuel supply agreements with Central Coal Fields Limited & Northern Coal Field, subsidiaries of Coal India Limited & Northern Coal Field, for the supply of coal to the BEL Power Plants. The BEL Power Plants have been fully operational since 2012 and possess an operational track record of more than eight years.

1.7 About National Productivity Council (NPC)

National Productivity Council, an autonomous body under the Ministry of Industry, Government of India, was established in the year 1958, to promote productivity culture in the country. It is a tri-partite, non-profit making organization, with equal representation from the government, employers and workers organizations, apart from technical and professional institutions and other interests on its governing council. NPC, as an apex body, provides consultancy and training in various fields including Energy Management, over the past five decades and undertakes research in the areas of productivity. NPC has 12 regional offices in India and a total strength of about 135 professionals/consultants. NPC with its regional offices located in major cities / industrial cities has unique advantages in carrying out multi location assignments and assignments on all India basis.

Energy Management group of NPC has a total strength of around 30 fulltime EM professional out of which around 18 are certified Energy Auditors and about 10 are accredited energy auditors from Bureau of Energy Efficiency. NPC provides consultancy as well as capacity building services to several international, national as well as unit level clients. EM Group offers consulting

services in various sectors including industry, power generation, distribution, commercial, agriculture and SME clusters.

1.8 About the Plant

The total installed capacity of BEL, Kundarki plant is 90 MW (2x45MW).
The major performance parameters of the Plant for a representative day during 1st July 2020 are:

Table 1: Performance Parameters of the plant

Parameters	Units	Unit 1 (45MW)	Unit 2 (45MW)	Station
At partial loading (55%)				
Avg. Generation	MW	24.57	24.21	48.78
Avg. daily Steam (Boiler)	TPH	99.2	99.36	198.56
Make-up water	TPD	24		
Make-up water	TPH	1.00		
% of DM Make-up water w.r.t. as run steam flow	%	0.50%		

2. Existing System

2.1 Installed Capacity

BEL, Kundarki plant has an installed capacity of 90 MW as per the details given below:

2 x 45 MW	=	90 MW
Total	=	90 MW

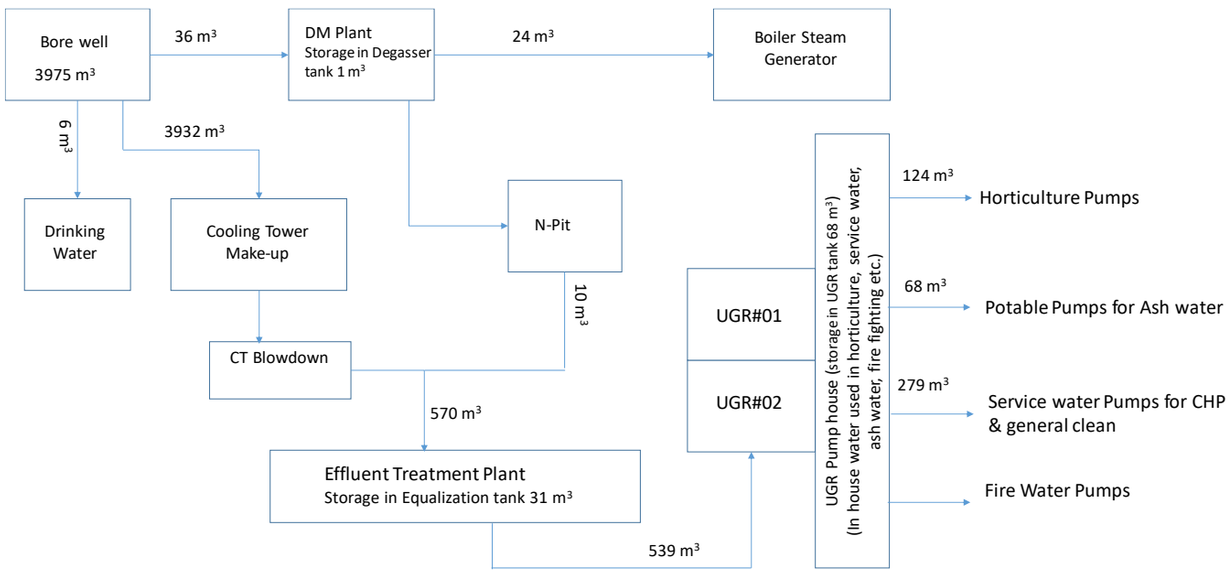
The following section describes the specifications of equipment related to various water systems in the plant.

2.2 Overall Water Balance Summary of the plant

Table 2: Overall Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	**165.60**	**3974.50**	
2	**Total outflow**			
2.1	DM plant inlet	1.49	35.75	
2.2	Drinking water	0.25	6.00	
2.3	CT make-up {1.1 - (2.1+2.2)}	163.86	3932.75	
	Total outflow	**165.60**	**3974.50**	

2.3 Overall Water Balance Diagram of the plant on Particular Day.



2.4 Bore well water and DM Plant

Kundarki plant draws raw water from surface water by two bore well pumps, then it is pumped to DM plant for DM water generation, potable water for drinking water and cooling water make-up.

Table 3: Water Consumption and Balancing (Borewell Water & DM Plant)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr)	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day)	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Borewell Pump - 1 (at near DM plant)	143	17.00	1	101	2431		
2	Borewell Pump - 2 (at near shop)	147	10.50	1	64	1543.5		
1	Total Inflow of Raw water Make-up (1+2).				166	3975		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	65	0.55	1	1.5	35.75		
	Inflow of DM plant				**1.5**	**36**		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	8	2.9	1	1	24		
2.2	N-pit Pump (CT blowdown line to ETP inlet)	67	0.2	1	0.42	10.05		
2.1.1	DM Transfer Pump - 1	27	0.9	1	1	24		VFD install
	Outflow of DM plant (2.1+2.2)				1.5	34		
	Difference				0.07	1.71		Storage in Degasser

Table 4: Assessment of Water Pumps Performance (Bore well water & DM Plant)

		Borewell Pump - 1 (18.5 kW)	Borewell Pump - 2 (22 kW)	N-Pit Pump
Particulars	**Unit**	**Pump**	**Pump**	**Pump**
Design Details				
Motor				
Rated Power	kW	18.5	18.5	7.5
Rated Voltage	V	415	415	415
Full Load Amps	A	37.5	37.5	14.3
Efficiency (η)	%	85	85	85
Speed	RPM	2850	2850	2850
Pump				
Head	m	25	25	30.28
Water flow rate	m^3/hr	180	180	45
Efficiency (η)	%	NA	NA	NA
Speed	rpm	2895	2895	2764
Measured Parameters				
Suction pressure	kg/cm^2	0.0	0.0	-0.15
Discharge pressure	kg/cm^2	0.9	0.9	0.5
Water flow rate	m^3/hr	143	147	67
Power input	kW	14	15	7
Motor Efficiency (estimated)	%	85	85	85
Calculation				
Suction head	m	0	0	-1.5
Discharge head	m	9	9	5
Total head	m	9	9	6.5
Water flow rate	m^3/s	0.040	0.041	0.019
Density of water	kg/m^3	1000	1000	1000
Hydraulic power	kW	3.51	3.61	1.19
Shaft power	kW	11.90	12.63	6.02
System efficiency	%	25.05	24.26	16.77
Pump efficiency	%	**29%**	**29%**	**20%**
% loading of flow	%	79%	82%	149%
% loading of head	%	36%	36%	21%
% Motor loading	%	64%	68%	80%
SEC (kWh/m3)		0.10	0.10	0.11

Analysis and observation

1. **Bore well pump-1 & 2:** Pump efficiencies are found to be much lower (29% and 29% respectively) than the design value.

2. **"N" pit Pump:** Pump efficiency is found to be much lower (20%)compared to the design value.

2.5 Effluent Treatment Plant (ETP) and Underground reservoir (UGR) tank

Cooling tower blow-down and "N" pit water are sent to ETP for treatment and after treatment the clean water is pumped into the UGR tank. UGR water is used for:

1. Horticulture water;
2. Ash water;
3. Service water and
4. Fire water

Table 5: Water Consumption and Balancing

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs. per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr.) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1	ETP inlet (CT blowdown riser 1&4)	114	5.0	1	24	570		
	Inflow of ETP				**24**	**570**		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet (Filter feed pump)	49	11	1	22	539		
	Outflow of ETP				**22**	**539**		
	Difference				**1.29**	**31.00**		Storage in equalization tank.
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				22	539		
	Inflow of UGR				22	539		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Horticulture Pump	19	6.5	1	5	124		
2.2	Potable Pump for Ash water	34	2.0	1	3	68		
2.3	Service Water	93	3.0	1	12	279		
	Outflow of				20	471		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs. per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr.) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	UGR							
	Difference				2.85	68.50		Storage in UGR tank & losses.

Table 6: Assessment of Water Pumps Performance

Filter Feed Pump (ETP outlet to UGR tank)		
Particulars	**Unit**	**Pump**
Design Details		
Motor		
Rated Power	kW	7.5
Rated Voltage	V	415
Full Load Amps	A	16.5
Efficiency (η)	%	85
Speed	RPM	NA
Pump		
Head	m	28
Water flow rate	m^3/hr	68.4
Efficiency (η)	%	NA
Speed	rpm	NA
Measured Parameters		
Suction pressure	kg/cm^2	0.1
Discharge pressure	kg/cm^2	3.0
Water flow rate	m^3/hr	49
Power input	kW	7
Motor Efficiency (estimated)	%	85
Calculation		
Suction head	m	1
Discharge head	m	30
Total head	m	29
Water flow rate	m^3/s	0.014
Density of water	kg/m^3	1000
Hydraulic power	kW	3.87
Shaft power	kW	6.04
System efficiency	%	54.51

Filter Feed Pump (ETP outlet to UGR tank)		
Particulars	**Unit**	**Pump**
Pump efficiency	**%**	**64%**
% loading of flow	%	72%
% loading of head	%	104%
% Motor loading	%	81%
SEC (kWh/m3)		0.14

Analysis and observation

1. **Filter Feed Pump (ETP outlet to UGR):** Pump efficiency is found to be lower (64%) compared to design value of 75%. The operational factors influencing efficiency variation are felt to have lower loading on flow and higher loading on head.

2.6 Circulating Water (CW) Pumps, Auxiliary Cooling Water (ACW) Pumps and Auxiliary Cooling Water (ACW) Booster Pumps

CW pumps and ACW pumps supply water from cooling tower cold basin to the condenser from where the return water is sent to cooling tower. There are three CW pumps, of which one pump is in operation during study period (at 55% loading). Each Pump capacity is of 8600 m^3/hr and there are two ACW pumps, of which one pump is in operation during study period (at 55% loading)

There are two CW booster pumps provided for each unit to meet the auxiliary equipment cooling requirements, of which generally one pump is in operation. These pumps take suction from condenser cooling water inlet header and after heat exchange duty the water is returned to condenser cooling water outlet header.

Operational schedule of the CW pumps, ACW pumps and CW booster pumps at different unit loading condition:

- At partial load (55%) = 1 CWP + 2 ACWPs + 1 ACW Booster pump are in operation.
- At full load (100%) = 2 CWPs + 1 ACWPs + 2 ACW Booster pumps are in operation.

Water distribution circuit diagram

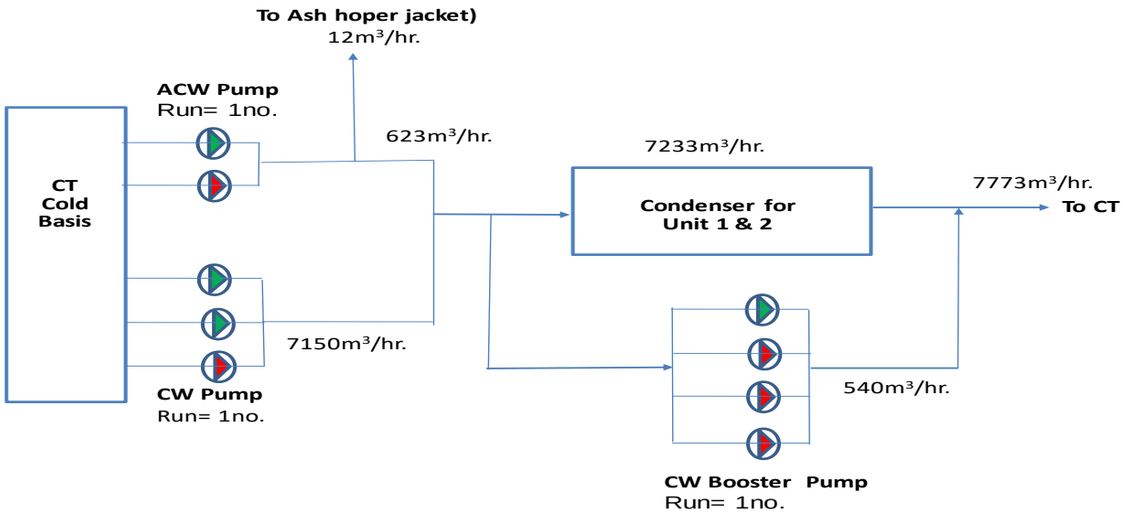


Table 7: Water Consumption and Balancing (CW Pump)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m³/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m³/hr) (@24hrs / day).	Avg. Flow (m³/day)	Remarks
1	**Cooling Water (CW) System**					
1.1	CW Pump-2	7100	24	7100	170400	*1 CWP + 1 ACWP + 1 ACW booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW. *2 CWPs + 1 ACWP + 2ACW booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1.2	CW Pump-3	7200	24	7200	172800	
1.3	ACW Pump-2 (flow at CW common header discharge line)	623	24	623	14952	
	ACW Pump-2 (flow at Ash hoper jacket)	12	24	12	288	Stop ACW water flow (12m3/hr) for Ash hopper jacket cooling. This amount of water is used from potable pump (UGR tank).
1a	Total Cooling water flow at partial load (55%).			7773	186552	*1 CWP + 1 ACWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
1b	Total Cooling water flow at full load (100%).			14923	358152	*2 CWPs + 1 ACWP + 2 ACW Booster pumps are run at full load

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
						(100%) = 100% x 2x45MW = 90MW.

Operation schedule of CWP, ACWP and ACW Booster pump during May, June and July:
**** 1 CWP + 2 ACWPs + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.***
****2 CWPs + 2 ACWPs + 2 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.***

Table 8: Water Consumption and Balancing (ACW Pump)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**ACW Booster Pumping System**					
1.1	ACW Booster Pump 1 (U#1)	540	24	540	12960	*1 ACW Booster pump is run at partial load (55%) = 55% x 2x45MW = 49.5MW. * 2 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1	**Avg. of ACW Booster pump**	**540**		**540**	**12960**	
	CW Flow to Condenser (by calculation)					
1	CW flow to Condenser at partial load (55%) = 55% x 2x45MW = 49.5MW.	7233	24	7233	173592	* 1 CWP - 1 ACWP are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
2	CW flow to Condenser at full load (100%) = 100% x 2x45MW = 90MW.	13843	24	13843	332232	* 2 CWPs - 1 ACWP are run at full load (100%) = 100% x 2x45MW = 90MW.

Table 9: Assessment of Water Pumps Performance (CW & ACW Pumps)

		Circulating Water (CW) Pump - 2	Circulating Water (CW) Pump - 3	ACW Booster Pump 1 (U#1)	ACW Pump - 2
Particulars	**Unit**	**Pump**	**Pump**	**Pump**	**Pump**
Design Details					
Motor					
Rated Power	kW	700	700	55	75
Rated Voltage	V	11000	11000	420	420
Full Load Amps	A	46.5	46.5	96	126
Efficiency (η)	%	92	92	90	90
Speed	RPM	745	745	1470	1480
Pump					
Head	m	23.16	23.16	25	35.41
Water flow rate	m^3/hr	8600	8600	500	500
Efficiency (η)	%	89	89	NA	NA
Speed	rpm	745	745	1416	1480
Measured Parameters					
Suction pressure	kg/cm^2	0.0	0.0	1.2	0.0
Discharge pressure	kg/cm^2	1.7	1.9	3.5	2.3
Water flow rate	m^3/hr	7100	7200	540	635
Power input	kW	602	575	53	73
Motor Efficiency (estimated)	%	92	92	90	90
Calculation					
Suction head	m	0	0	12	0
Discharge head	m	17	19	35	23
Total head	m	17	19	23	23
Water flow rate	m^3/s	1.972	2.000	0.150	0.176
Density of water	kg/m^3	1000	1000	1000	1000
Hydraulic power	kW	328.91	372.78	33.88	39.80
Shaft power	kW	553.76	528.56	47.39	65.57
System efficiency	%	54.64	64.89	64.34	54.63
Pump efficiency	**%**	**59%**	**71%**	**71%**	**61%**
% loading of flow	%	83%	84%	108%	127%
% loading of head	%	73%	82%	92%	65%
% Motor loading	%	79%	76%	86%	87%
SEC (kWh/m3)		0.08	0.08	0.10	0.11

Analysis and observation

1. **Circulating Water (CW) Pumps (No: 2& 3):** Pump efficiencies of 59% & 71% respectively are found to be below compared to design value 89%. The operational factors influencing efficiency variation is felt to be lower loading on flow and head.
2. **ACW Booster Pump 1 (Unit-1):** Pump efficiency of 71% is found to be at satisfactory level.

3. **Auxiliary Cooling Water (ACW) Pump 2:** Pumps efficiency of 61%is found to be below compared to design value. The operational factors influencing efficiency variation is felt to be higher loading on flow and lower loading on head.

2.7 Cooling Tower System

Performance Evaluation of Cooling Tower at partial loading (55%) is given below:

At Partial Loading (55%) = 55% x (2x45MW) = 49.5MW

Table 10: Performance Evaluation of Cooling Tower

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Cooling Tower (CT) System					
1	Unit Load	MW	25	24	49	45MW as per design.
	% of NCR	%	55%	54%	54%	
2	CW flow	m^3/hr	7773		7773	Design flow (8600 m^3/hr.
3	CW inlet water temperature	^oC	33	33.13	33	
4	CW outlet water temperature	^oC	42	44.11	43	
5	Temperature difference	^oC	9	11	10	10^oC as design.
6	DBT at ambient	^oC			32	
7	WBT at ambient	^oC			28	
8	C.O.C				6	
9	Evaporation loss	m^3/hr			117	
		%			1.51%	As per design 1.67%.
10	Blow down as per calculation	m^3/hr			26	
10a	Blow down as per measurement	m^3/hr			33	
11	Total CT make-up as per calculation	m^3/hr			143	
12	Range	^oC			10	
13	Approach	^oC			5.21	4^oC as per design
14	Effectiveness				0.65	

2.8 Condenser System

Performance Evaluation of Condenser System at partial loading (55%) is given below:

At Partial Loading (55%) = 55% x (2x45MW) = 49.5MW

Table 11: Performance Evaluation of Condenser System

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Condenser System					
1	Unit Load	MW	25	24	49	At NCR 45MW as per design.
	% of NCR	%	55%	54%	54%	

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
2	CW flow of condenser (by calculated)	m^3/hr	7233		7233	7923 m^3/hr at 100%loading.
3	CW inlet water temperature	^oC	33	33.13	33	32^oC as design.
4	CW outlet water temperature	^oC	42	44.11	43	42^oC as design.
5	Temperature difference	^oC	9	11	10	10^oC as design.
6	Condenser Thermal Load as run condition	million kCal/hr			71	

3. Environmental Compliances Related to Water

Being a reputed thermal power generating company of Uttar Pradesh state, Bajaj Energy Limited Gonda Unit has to fulfil the environmental compliances as per the guidelines given by Central Ground Water Authority (CGWA) and **Uttar Pradesh Pollution Control Board (UPPCB)**.

Table 12: Compliances related to Water

Sl. No.	Condition	Status/ Compliance	Remarks
1	The plant may extract 6,984 m3/day (≤20,95,850m³/year) with two existing bore wells.	The plant is maintaining the water withdrawal limit	Checked during visit
2	Digital Meters must be installed at each bore well and log book must be maintained	Digital meters are installed for both bore well and log book is maintained	
3	Ground water level monitoring through existing piezometers.	Plant is continue monitoring the ground water level	Ground water level data are attached in Annexure-I
4	Recycling and reuse of waste water	Complied	-

Water Saving Potential at Bajaj energy units of having capacity (2 x 45 MW each)		
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m³/MWH.		
While as per CGWA NOC BEL plants are entitled for daily ground water withdrawal of 6984 m³/day which is equivalent to 3.23 m³/MWH at station full load running condition. This withdrawal limit is already less than MOEF norms		
Recently CGWA has issued guideline dated 24 sept 2020 which states as following "All industries abstracting ground water in excess of 100 m³/day shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means. "		
Therefore we have worked out the maximum water saving potential in all BEL stations and also worked out best specific water consumption which can be achieved by BEL stations		
Specific water consumption As per MOEF (m³/MWH)	3.50	
Approved water quantity per day by CGWA(m³/day)	6984	
Specific water consumption As per CGWA Approved water quantity (m³/MWH)	3.23	
A. Water consumption Break up at full load at COC-7	Quantity (m3)	Remarks

Evaporation Loss (m^3/Day)	5914	
Drift Loss (m^3/Day)	6	
COC	7	
Blow Down loss(m^3/Day)	986	
Cooling Tower Make up(m^3/Day)	6906	
Potable Water Quantity (m^3/day)	10	
Evaporation loss from water reservoir (m^3/day)	3	
DM Plant Make up(m3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	6984	
Horticulture (m^3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (m3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption

B) Saving Potential at Full Load Condition

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 591 M3 Water may be utilised as CT Make up

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	591	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(m3/Day)	6314	
DM Plant Make up(M3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (m3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (m3/Day)	50	
Total Bore well water required(m3/day)	6443	
Water saving from approved Quantity (m^3/day)	541	
% Water Saving from approved Quantity)	7.8%	

Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9

Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	5914	
Drift Loss (M3/Day)	6	

COC	9	
Blow Down loss(M3/Day)	739	
Water Being used as CT make up from UF RO System(70% recovery)	517	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	6142	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	6270	
Water saving from approved Quantity (M3/Day)	714	
% Water Saving from approved Quantity	10.2%	
Maximum Possible water saving is 10.20%		

We have also worked water saving potential at 80% Loading factor.		
Specific water consumption As per MOEF (M3/MWH)	3.50	
Proportionate water quantity at 80% Loading Factor per day(m3/day)	5587	80% quantity
Specific water consumption As per CGWA Approved water quantity (M3/MWH)	3.23	
C. Water consumption Break up at 80% load at COC-7	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	7	
Blow Down loss(M3/Day)	789	
Cooling Tower Make up(M3/Day)	5525	
Potable Water Quantity (m3/day)	10	
Evaporation loss from water reservoir (m3/day)	3	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	5603	
Horticulture (M3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (M3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumpti

		on
D) Saving Potential at 80% Load Condition		
Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7		
Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 414 M3 Water may be utilised as CT Make up		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	473	Reject of UF RO will be used for CHP dust suppressio n, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	5052	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5180	
Water saving from approved Quantity (M3/Day)	407	
% Water Saving from approved Quantity)	7.3%	
Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9		
Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	9	
Blow Down loss(M3/Day)	591	
Water Being used as CT make up from UF RO System(70% recovery)	414	Reject of UF RO will be used for CHP dust suppressio n, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	4914	
DM Plant Make up(M3/Day)	65	

Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5042	
Water saving from approved Quantity (M3/Day)	545	
% Water Saving from approved Quantity	9.8%	
% Water Saving from approved Quantity : 9.8%		

Conclusion: It is seen from the above working that 20% reduction target is difficult to achieve in thermal power plants.

Apart from the above, plant will take up annual water audit and adopt measures to reduce fresh water consumption, monitor the ground water and will submit all the data to the concerned authority.

Table 13: Plant Production and Consumption Details

Sl. No.	Description	2019-20 (June, 2019-May, 2020)
1	Total Power Generation (MWh)	080097
2	Total Raw Water Consumption (m3)	270905
3	Specific Raw Water Consumption (m3/MWh)	3.38

Table 14: Treated Water Parameters

Sl. No.	Location	Parameter	Unit	Actual Value	CPCB Standard Value (Inland Surface Water)
1	ETP I/L	pH	-	6.96	-
2		Total Suspended Solid (TSS)	mg/l	90	-
3		Bio-chemical Oxygen Demand (BOD)	mg/l	58	-
4		Chemical Oxygen Demand (COD)	mg/l	646	-
5		Oil & Grease	mg/l	1.6	-
6	ETP O/L	pH	-	7.46	5.0-9.0
7		Total Suspended Solid (TSS)	mg/l	26	100
8		Bio-chemical Oxygen Demand (BOD)	mg/l	16	30
9		Chemical Oxygen Demand (COD)	mg/l	60	250

***Sample collected on 20/06/2020 by third party. Testing was conducted the third party.**

Table 15: Ground Water Parameters

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
1	Colour	HZN	<5.0	5 max	15 max

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
2	Odour	-	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1.0	1 max	5 max
5	pH	-	7.62	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	186	200 max	600 max
7	Iron (Fe)	mg/L	0.26	0.3 max	No Relaxation
8	Chloride (Cl)	mg/L	136	250 max	1000 max
9	Residual Free Chlorine	mg/L	<0.2	0.2 min	1
10	Sulphates (SO_4)	mg/L	96	200 max	400 max
11	Total Alkalinity	mg/L	154	200 max	600 max
12	Fluoride (F)	mg/L	0.36	1.0 max	1.5 max
13	Total Dissolved Solid (TDS)	mg/L	470	500 max	2000 max
14	Total Coliform	MPN/100ml	Not Detected	-	-
15	E coli	/100ml	Not Detected	-	-

***as per IS 10500**

Sample collected on 20/06/2020 by third party. Testing was conducted the third party.

From the above tables, it seems that the plant is complying with all parameters mentioned by CGWA and UPPCB.

4. Water and Energy Conservation Options

4.1 RECOMMENDATION – 1: Install Energy Efficient Borewell pumps set with VFD Drive

Present Scenario

As a part of the water audit study, operating performance of the Bore well pumps were assessed by measuring different parameters, like flow, pressure andcorresponding power input to the drive motor. It was observed that the said pump drive motors were operating with low system efficiency level (pump, motor).

Proposed Measure

It is proposed that the above identified underperforming pumps & motors to be replaced by energy efficient pump sets with VFD drive, effecting reduction in energy consumption.

Table 16: Cost Benefit Analysis for Recommendation 1

Item Ref	Unit	Bore well Pump - 1 (18.5 kW)	Bore well Pump - 2 (22 kW)	Total
Present Condition:				
No of pumps operation	No	1	1	
Motor input (Avg.)	KW	14.00	14.86	
Water flow (Avg.)	m3/hr	143	147	
Total Head Dev (THD) (Avg.)	mWC	9	9	
Liquid kW / Pump shaft power (Avg.)	KW	3.507	3.605	
System Efficiency (Pump & motor) (Avg.)	%	25.05%	24.26%	
Proposed Condition:				
Pump Efficiency under proposed condition (Avg.)	%	60	60	
Motor efficiency (assume)	%	85	85	
Proposed system Efficiency (Pump & motor)	%	51	51	
Proposed motor input (pump set)	kW	6.88	7.07	
Power savings of each pump	kW	7.12	7.79	
Annual Hrs. operation	Hrs/Yr.	6205	3833	
Envisaged reduction in annual energy consumption in the pump drives.	kWh	44205	29871	74076
	MU/Yr.	0.044	0.030	0.074
Unit selling Price	INR/kWh	3.25	3.25	
Annual Energy Cost savings potential	INR in Lakhs	1.44	0.97	2.407
Investment for Energy Efficient Pump set (Pump & motors and borewell) with VFD drive	INR in Lakhs	5	5	10
Simple Pay Back Period	Yrs.	3.48	5.15	4.15

4.2 RECOMMENDATION –2: Pump Efficiency Improved by Overhauling of CW pumps

Present Scenario:

As a part of the water audit study, operating performance of the CW pumps 2 was assessed by measuring different parameters, like flow, pressure & corresponding power input to the drive motor. It was observed that the said pump drive motors were operating with low system efficiency level (pump, motor).

Proposed Measure

It is proposed that the above identified underperforming pump & motor to be replaced by energy efficient pump sets with VFD drive, effecting reduction in energy consumption.

Table 17: Cost Benefit Analysis for Recommendation 2

Item Ref	Unit	Circulating Water (CW) Pump - 2
Present Condition:		
No of pumps operation	No	1
Motor input (Avg.)	kW	601.92
Water flow (Avg.)	m3/hr	7100
Total Head Dev (THD) (Avg.)	mWC	17
Liquid kW / Pump shaft power (Avg.)	KW	328.908
System Efficiency (Pump & motor) (Avg.)	%	54.64%
Proposed Condition:		
Pump Efficiency under proposed condition (Avg.)	%	70
Motor efficiency (assume)	%	90
Proposed system Efficiency (Pump & motor)	%	63
Proposed motor input (pump set)	kW	522.08
Power savings of each pump	kW	79.84
Annual Hrs. operation	Hrs/Yr.	1400
Envisaged reduction in annual energy consumption in the pump drives.	kWh	111779
	MU/Yr.	0.112
Unit selling Price	INR/kWh	3.25
Annual Energy Cost savings potential	INR in Lakhs	3.63
Investment for Overhauling	INR in Lakhs	3
Simple Pay Back Period	Yrs	0.83

5. Rain Water Harvesting Potential

5.1 Rain Water Harvesting Programme

Rain Water Harvesting, is an age-old system of collection of rainwater for future use. But systematic collection and recharging of ground water, is a recent development and is gaining importance as one of the most feasible and easy to implement remedy to restore the hydrological imbalance and prevent a crisis. Rain water harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later. Rooftop rainwater harvesting: Rooftop rainwater from the administrative office area, factory area and other plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells.

The recharge wells will be provided with recharge bores to facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside the recharge well ensure efficient filtration. In addition to this Rain water harvesting and groundwater recharge structures will also be constructed outside the plant premises to augment the ground water level.

In scientific terms, water harvesting refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage and all other hydrological studies and engineering inventions, aimed at conservation and efficient utilization of the limited water endowment of physiographic unit such as a watershed. Rain is a primary source of water for all of us. There are two main techniques of rainwater harvesting:

- Storage of rainwater on surface for future use
- Recharge to groundwater

Directly collected rainwater can be stored for direct use or can be recharged into the groundwater. All the secondary sources of water like rivers, lakes and groundwater are entirely dependent on rain as a primary source.

Rainwater harvesting structures shall be provided to recharge the groundwater resources in the region. The run-off water from the roof of the structures and paved areas shall be collected through storm water drainage system and led to rain water harvesting structure.

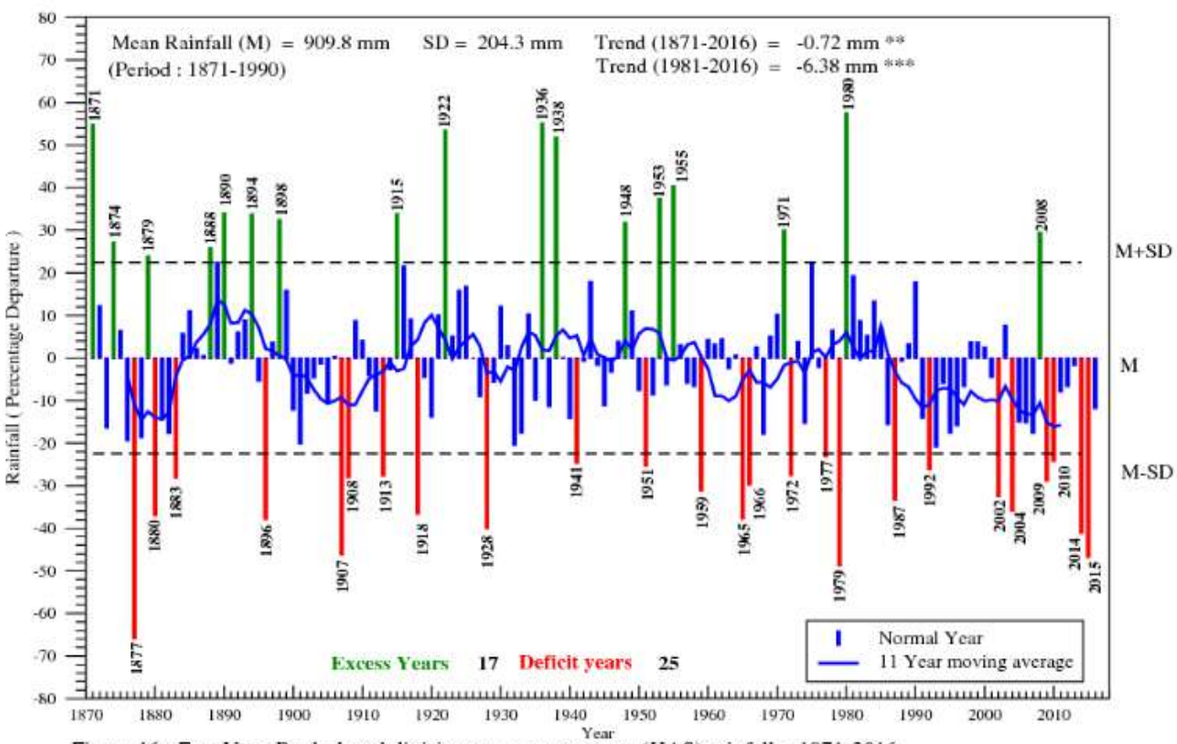


Figure 16 : East Uttar Pradesh subdivision summer monsoon (JJAS) rainfall : 1871-2016
(Trend - mm/year, *, ** and *** significance at 10 %, 5 % and 1 % level, rainfall data for the period 1871-2012 based on 306 stations and 2013-2016 based on IMD subdivisional rainfall)

Annual Rain Fall	***909.8 mm (East UP)***

5.2 Rainwater Harvesting Facilities

For augmenting the ground water resources in the plant premises, number of rainwater harvesting pits will be constructed and the internal drains where excess rain water flowing in drain will be diverted to these pits. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. The roof top water will be routed to the storm drains. This will result in increase in groundwater tables and to some extent the improvement of ground water quality.

Rainwater Harvesting in Kundarki unit will be very useful. With respect to the physical alternatives to fulfil sustainable management of freshwater, there are two solutions - first reuse the rainwater at washroom, gardening and the second is for ground water recharge.

The size and the locations of rainwater harvesting pits will be decided during detailed engineering of the project.

Run off from the proposed project site is calculated using rational formula:

$$Q = C \times I \times A$$

Q = Run-off in m3/hr

A = Catchment Area (Sq.m)

C = Coefficient of Run-off

I = intensity of Rainfall in mm/yr

5.3 Rain Water Harvesting Potential Calculation

Table 18: Rainfall Data

Particulars	Unit	Values
Intensity of rainfall (in mm) based on IMD Data	mm/yr.	909.8
No. of rainy days		48
Rainfall per day	mm/day	18.954
	m/day	0.0190

Table 19: Roof top area

Roof Top Area											
Description	**Unit**	**Values**									
		TG Building	**Deaerator Floor**	**Stores**	**Switchyard control room**	**DM Plant MCC & Lab**	**ESP Control room**	**CHP Control room**	**UGR MCC**	**Boiler roof**	**Unit Panel Room**
Drainage area in m2	m2	2170	860	650	84	120	250	160	60	750	60
Coefficient of run-off	-	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Runoff	m3/day	34.961	13.855	10.472	1.353	1.933	4.028	2.578	0.967	12.083	0.967
Total runoff	m3/day	**83.197**									

Table 20: Storage Potential**

Location	Unit	*Values
TG Building	m3/day	13.98
Deaerator Floor	m3/day	5.54
Stores	m3/day	4.19
Switchyard control room	m3/day	0.54
DM Plant MCC & Lab	m3/day	0.77
ESP Control room	m3/day	1.61
CHP Control room	m3/day	1.03
UGR MCC	m3/day	0.39

Location	Unit	*Values
Boiler roof	m3/day	4.83
Unit Panel Room	m3/day	0.39
Total	**m3/day**	**33.28**

***Considering collection efficiency to be 40%*

5.4 Recommendation for use of rain water

- The collected rain water can be pumped to a combined filtration system for removal of suspended solids and other impurities. Sand filter and activated carbon filter can be installed for filtration of rainwater before reuse.
- The following overarching goals apply to the implementation of rain water harvesting and reuse systems:
  - ✓ Reduction of rain water pollutant loads and flows to surface waters, helping achieve local rain water management requirements;
  - ✓ Reduction of the demand on potable water sources; and
  - ✓ Reduction of stress on the existing water supply infrastructure.
- Additionally, rain water harvesting and reuse systems can be used to help achieve Leadership in Energy and Environmental Design (LEED) and other sustainable design credits related to rain water quantity and quality as well as water efficiency.
- Although rain water harvesting and reuse systems appear to be a viable alternative to help achieve required rain water management standards as well as reducing the demand on the potable water supply, they are not without concerns. Concerns include human exposure to pathogens, cross-contamination of the potable water supply and exposure due to ingestion of crops potentially contaminate harvested rainwater for bacteriological parameters and other organic load before reuse in processes.

6. Motor Load Survey

Table 21: Motor Load survey

Circulating Water (CW) Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	kW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11203	39.60	0.78	601.92	79.11
Circulating Water (CW) Pump - 3									
Phase Ref.	Rated Parameters				Measured Parameters				
	kW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	46.7	94.7	11000	38.33	0.79	574.52	75.51
ACW Booster Pump 1 (U#1)									
Phase Ref.	Rated Parameters				Measured Parameters				
	kW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	93	421	83.00	0.87	52.65	86.16
ACW Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	kW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	75.0	415	126	93	422	114.67	0.87	72.86	87.43
Borewell Pump -1 (near DM plant)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	18.5	415	37.5	90	425	23.50	0.81	14.00	68.11
Borewell Pump -2 (at near shop)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	22.0	415	43	90	426	28.00	0.72	14.86	60.80
N-Pit Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	85	424	10.60	0.91	7.08	80.22
Service Water Pump - 1									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	75.0	415	128	90	418	97.00	0.88	62.08	74.50
Filter Feed Pump (ETP outlet to UGR tank)									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	420	15.4	85	416	11.60	0.85	7.10	80.51

7. Checklist List for Self-Assessment For Determining Water Efficiency For Facility Managers

Sl.No.	Activities	Descriptions	Frequency
1	Monitoring of cycle of concentration	Cooling towers are normally designed for a COC of 5 with requirement of makeup water typically about 2.1% of water flow (comprising of 1.7% evaporation loss, 0.05% drift loss and 0.35% as blow down). By increasing the COC, the blow down quantity can be reduced by external water treatment and adding water treatment chemicals, COC of even 10 can be reached. Increasing COC can result in significant savings of water as the blow down will be further reduced by suitably improving the chemical regime of circulating water, if feasible	Weekly
2	Monitoring of leaks and overflows	Leakages from valves, taps, fire fighting hoses, underground fire fighting lines, cooling tower basin, gardening hoses area also a source of water loss. There lies a possibility of reducing the water consumption by plugging the leakages. For every litre of water lost in a water network, another litre of water has to be treated and pumped through the distribution network to compensate.	Weekly
3	Installation of Pressure Gauges and Monitoring	In both the suction and discharge side of the circulating pumps. If the gauge indicates the pressure (or pressure drop) in the process, that information is valuable only if one can do something about it like cleaning a filter.	Daily
4	Calibration of Water flow meters	Annual Calibration of all the water flow meters and pressure gauges must be ensured. A calibrated instruments ensures that the measurements and readings taken are authentic and hence can be used for reference for other study very easily	Annual
5	Operational hours of the circulating pumps to be monitored	In the log book on a continuous basis. Inclusion of operational hours in the log book keeps a track record of the running hours of individual pumps and hence is helpful to optimize the pumping operations if required.	Daily
6	Water quality test report of the Cooling Tower basin	To be conducted in shift-wise. This is important to ensure that COC of the cooling tower is maintained at the desired level to reduce the cooling tower blow down.	Shift wise
7	Maintenance of log book of the cooling tower make up water flow and soft plant water flow	A log book of the cooling tower make up water flow and soft plant water flow In the cooling tower to be maintained. Soft water being a costly water should be monitored along with the makeup water for cooling tower.	Daily
8	Monitoring the amount of	Determining whether discharge from any one operation can be substituted for fresh water supply to another operation. In	Daily

Sl.No.	Activities	Descriptions	Frequency
	discharge water	many cases, where water quality is not much of significance but is only used for washing and cooling purposes, the use of discharge water is recommended over fresh water.	
9	Reuse of wastewater after treatment	Handling waste materials in a dry mode wherever possible. Use of even wastewater should be minimized as far as possible.	Daily
10	Monitoring of raw water consumption	Reduction in water consumption in processes by closely monitoring of timings of processes and water circulation.	Daily
11	Monitoring of Rainwater collected in reservoir/ pond	Collection of rain water from factory premises to reservoir / ponds for future use to reduce the raw water intake	Daily

Annexure-1

Ground Water Level data for BEL Gonda unit are given below:

Piezometer reading	
Date	**Average Ground Water Level**
8-Apr-19	6.58
9-Apr-19	6.59
10-Apr-19	6.53
11-Apr-19	6.61
12-Apr-19	6.58
13-Apr-19	6.65
14-Apr-19	6.67
15-Apr-19	6.78
16-Apr-19	6.70
17-Apr-19	6.42
18-Apr-19	6.50
19-Apr-19	6.59
20-Apr-19	6.78
21-Apr-19	6.89
22-Apr-19	6.81
23-Apr-19	6.85
24-Apr-19	6.67

Piezometer meter	
Date	**Average Ground Water Level**
1-Aug-19	5.25
2-Aug-19	5.49
3-Aug-19	6.23
4-Aug-19	6.27
5-Aug-19	6.42
6-Aug-19	6.27
7-Aug-19	6.04
8-Aug-19	6.11
9-Aug-19	5.63
10-Aug-19	5.12
11-Aug-19	4.65
12-Aug-19	3.83
13-Aug-19	3.77
14-Aug-19	3.86
15-Aug-19	3.85
16-Aug-19	3.94
17-Aug-19	4.06
18-Aug-19	4.27
19-Aug-19	3.74
20-Aug-19	3.74
21-Aug-19	3.69
22-Aug-19	3.45

Piezometer meter	
Date	**Average Ground Water Level**
23-Aug-19	3.98
24-Aug-19	3.89
25-Aug-19	3.90
26-Aug-19	3.86
27-Aug-19	4.02
28-Aug-19	4.29
29-Aug-19	4.58
30-Aug-19	4.67

Benchmarks

The following table presents Water Consumption Norms of few countries and water consumption levels of some of major Thermal Power Plants in the country:

S No	Reference	Norm
1.	USA (*Source: National Renewable Energy Laboratory Report on Consumptive Water Use for US power Production*)	1.8 Ltrs/kWh
2.	South Africa (*Source:MIT Report on Water Footprint of Electric Power Generation*)	2.02 Ltrs/kWh
3.	National Norm for 500MW Indigenous Coal Based Plant with wet Cooling Tower (*Source: CEA Report minimization of water requirement in coal based Thermal Power station*)	3.0 ltr/kWh
4	National Norm 660MW Coal Based Super Thermal Power plant with ash water recycling (*Source: FICCI Bulletin on Energy Efficiency 2006*)	3.0 -4.0 m3/MW
5	National Norm 660MW Coal Based Super Thermal Power plant without ash water recycling. (*Source: FICCI Bulletin on Energy Efficiency 2006*)	4.0 -4.5 m3/MW
6	Water Consumption in Some of the Power plant in India (Source of data: Declared by the plant)	
(a)	Vidhyachal Stage I (6 X 210MW) (Raw water consumption is 4000m3/hr with AWRS in operation).	3.17m3/MW
(b)	Vidhyachal Stage II (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(c)	Vidhyachal Stage III (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(d)	Rihand thermal Power Station-Stage I & II(2 X 500MW + 2 X 500 MW) with AWRS in operation	3.21

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Report

on

Water Audit Study

at

Bajaj Energy Limited

(Maqsoodapur Plant)

Submitted to

Bajaj Energy Limited

Maqsoodapur Plant

Maqsoodapur, Distt. Shahjahanpur

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National Productivity Council

Water Audit Team

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Executive Summary

As part of on-going efforts to reduce Water Consumption, the progressive management of Bajaj Energy Limited approached NPC to carry out the Water Balance study of its 5 plants in Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur). The study is intended to be a Detailed Water audit study of the above Plants regarding their existing operating status of water use and suggesting relevant water conservation measures to be adopted to bring down the water consumption in the plant.

As a result, NPC team has carried out the field visit for water audit study at 5 Power Plants of Bajaj Energy Limited in July 2020. Available data pertaining to various key parameters were collected from the concerned officials. The necessary field measurements were carried out during the field study for assessing the existing water use scenario and to identify the water conservation measures. The report has been prepared for Maqsoodpur Plant based on the data/information collected/measurement taken by the NPC team and observations made during the field study are discussed in this report.

The following recommendations and findings made as per the observation of the study team:

Water Usage Scenario

The source of water is from two numbers of bore well pumps installed in the plant.

Specific water consumption is established on the basis of historical data collected from the plant and the same is tabulated below:

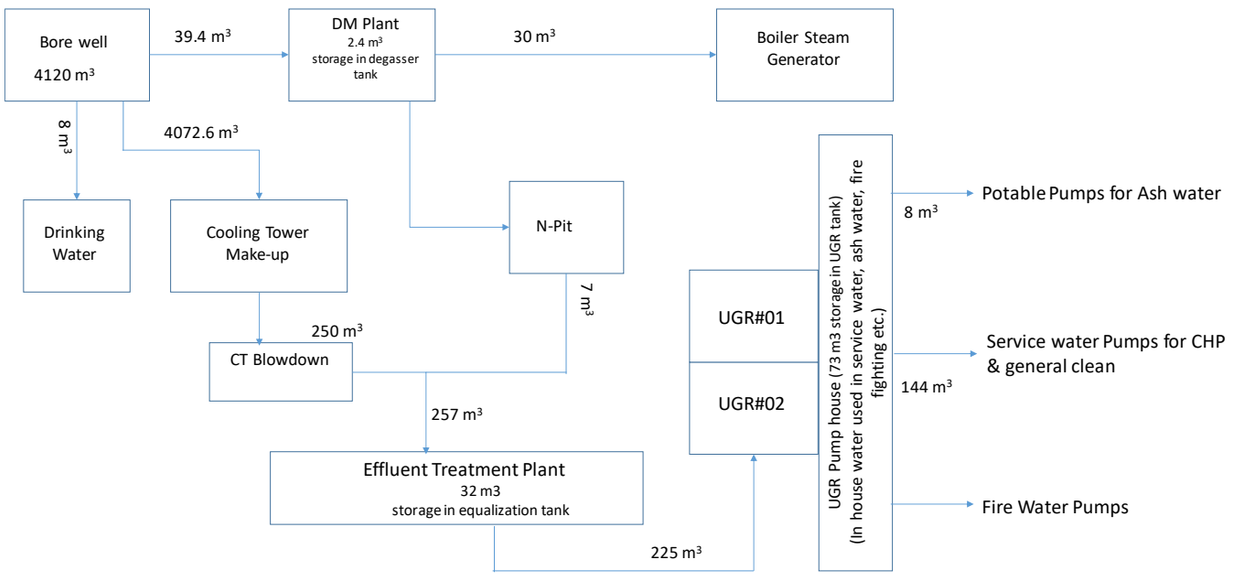
Table 1: Specific Water Consumption

Particulars	Unit	Value	Standard
Generation of 2 units (@45MW) *(July 2019 to June 2020)*	MU	74	• Standard Specific water consumption = 3.5 m^3/MWh.(as per MOEF notification dated 7th Dec'15)
Water consumption *((July 2019 to June 2020)*	m^3	224829	
Specific water consumption (m^3/MWh)	m^3/MWh	3.05	

** Period: July 2019 to June 2020.*

** Standard values for close loop circuil system.*

Actual measurement of Total water distribution on particular day at different usage areas is illustrated in the diagram below:


Bore well
4120 m³
39.4 m³
DM Plant
2.4 m³
storage in degasser tank
30 m³
Boiler Steam Generator
8 m³
4072.6 m³
Drinking Water
Cooling Tower Make-up
N-Pit
7 m³
250 m³
CT Blowdown
257 m³
Effluent Treatment Plant
32 m3
storage in equalization tank
225 m³
UGR#01
UGR#02
UGR Pump house (73 m3 storage in UGR tank)
(In house water used in service water, ash water, fire fighting etc.)
8 m³
Potable Pumps for Ash water
144 m³
Service water Pumps for CHP & general clean
Fire Water Pumps

Water Consumption & Water Balancing

Water consumption at different sections of the plant is given below:-

Table 2: Overall Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Total inflow**				
1.1	Total inflow	171.67	4120.00		
2	**Total outflow**				
2.1	DM plant inlet	1.64	39.40		
2.2	Drinking water	0.33	8.00		
2.3	CT make-up {1.1 - (2.1+2.2)}	169.69	4072.60		
	Total outflow	171.67	4120.00		

Table 3: Bore well water pumps to DM Plant

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Borewell Pump - 1 (near DM plant)	140	8.00	1	46.7	1120		
2	Borewell Pump - 2 (near UGR)	160	18.75	1	125	3000		
1	Total Inflow of Raw water Make-up (1+2).				172	4120		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	20	2.0	1	1.64	39.4		
	Inflow of DM plant				**2**	**39**		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage	12	2.5	1	1.25	30		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	tank							
2.2	N-pit Pump	35	0.2	1	0.3	7		
2.1.1	DM Transfer Pump - 1	44	0.5	1	0.9	22		VFD operated
	Outflow of DM plant (2.1+2.2)				1.5	37		
	Difference				0.10	2.40		Storage in Degasser tank

Table 4: Effluent Treatment Plant (ETP) and Underground reservoir (UGR)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	Inflow of Effluent Treatment Plant (ETP)							
1.1	ETP inlet (CT blowdown)	50	5.0	1	10.41	250		
1.2	N-pit				0.3	7		
	Inflow of ETP				10.70	257		
2	Outflow of ETP to UGR tank							
2.1	ETP Outlet (Filter feed pump)	50	4.5	1	9.38	225		
	Outflow of ETP				9.38	225		
	Difference				1.33	32.00		Storage in equalization tank
1	Inflow of underground reservoir (UGR) tank							
1.1	UGR inlet				9.38	225		
	Inflow of UGR				9.38	225		
2	Outflow of underground reservoir (UGR) tank							
2.1	Service Water for CHP,	72	2.0	1	6	144		Average Yearly running

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Cleaning and Horticulture							hours 2 Hrs.
2.2	Potable Pump for Ash water	16	0.5	1	0.33	8		
	Outflow of UGR				6.33	152		
	Difference				3.04	73.00		Storage in UGR tank

Summary of Recommendations

1. Install RO plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.
2. Pump Efficiency Improvement by Overhauling of CW pump 1.
3. Replacement of Underperforming Pumps of Bore well pumps (both) and Potable pump by Energy Efficient Pumps and Motors with VFD drive.
4. Pump Efficiency Improvement by Overhauling of ACW Booster pump 1.
5. Filter backwash water and N pit water are suggested to be used for service water and ash water.

General Observations and Recommendations

- Avoid overflows of water storage tanks by installing float-controlled valve at drinking water overhead storage tanks.
- Manage pressure in the system to ensure that optimal levels are maintained in the tanks. High pressure causes wear and tear on the system causing new leaks and increasing loss rates.
- Repair installed meters in different areas or zones monitor flow rates. Manage metered data by setting flow rate thresholds. When exceeded, it indicates possible system leaks.
- To carry out regular inspection of nozzles for clogging and leak and repair the detected leaks;
- Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow.

- Turning off all water flows during shutdowns unless they are essential for clean-up. To use solenoid valves to stop water flow when production stops (valves can be activated by connecting them to drive motor controls).
- Adjust pump cooling and water flushing to the minimum required level. Sharing of information with employees on water usage procedure and amount of water used for each application is recommended. This would promote how employee actions can reduce water usage.
- Place signs and placards near new equipment, making it easy to understand new technology and how to use it properly.

1. Introduction

1.1 Background

Water is one of the key input requirements for thermal power generation. Water is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.

Water is used in almost all areas/ facilities of thermal power stations in one way or other. A typical list of plant systems/ applications requiring consumptive water is indicated as below:

i) Cooling water system for condenser & plant auxiliaries
ii) Power cycle make up
iii) Equipment cooling system
iv) Air conditioning and ventilation system
v) Coal dust suppression system
vi) Service water system
vii) Potable water system
viii) Gardening
ix) Evaporation from raw water reservoir

Difficulties are already being faced in existing thermal power plants due to non-availability of water. This problem is expected to be aggravated in future when more sites would be required. Thus there is a need to minimize consumptive water requirement for thermal power plants. Optimization/ minimization of plant consumptive water includes measures such as judicious utilization of water in different applications, adoption of reduced margins in various consumptive uses, adequate treatment for deteriorating quality of raw water, use of plant waste waters in various low grade applications and recycling of plant waste waters to maximum extent.

Water audit is an important management tool for effective conservation of water. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one is consumption audit on demand side. Water audit in the plant is conducted to identify supplied water quantity, water usage, losses, water quality, identify and priorities areas which need immediate attention for control, raise awareness on monitoring water consumption and to provide suggestions for effective water conservation.

The broad area of scope of work includes performance assessment of raw water sources & existing storage systems, estimation of present water consumption, water balance across the entire system, assessment of water consumption per unit generation, water quality management plan, measures of improving efficiency of water utility networks and also to enhance operational efficiency through controls.

1.2 About the Project

BEL, as part of their energy efficiency and resource conservation endeavours, had initiated the process of Auditing of significant systems/subsystems on a regular basis, with a view of achieving resource consumption optimization and continuous improvement. As a part of it, the management of BEL approached National Productivity Council (NPC), Delhi, to conduct the "Water Audit Study of five of its plants located in the state of Uttar Pradesh". Onsite measurements for the above stated Water Audit Study was carried out during the month of July 2020.

This report provides details about the scope, methodology, measurements, water balance of individual subsystems and overall plant, findings and recommendations of the water balance study of Maqsoodpur plant.

1.3 Objectives and Scope of the Study

The broad objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

The scope of the water audit study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
  - Raw water
  - Clarified water
  - DM water
  - Circulating water
  - Waste water
- To develop norms for in-house water consumption and use in terms of m3/MWh for monitoring and targeting.

- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.
- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (whereever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:
  - ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.
  - ✓ Laboratory testing & analysis reports for key parameters.

1.4 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Maqsoodapur plant.

- ➢ Direct measurement-Using Ultrasonic Flow meter for clear water
- ➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
- Electrical measurements were carried out by using 3 phase Power Analyser.
- Standard pressure gauges were used for monitoring suction &discharge pressures of pumps.

1.5 Instruments used

- Ultrasonic Water Flow Meter
- 3-phase power analyser

1.6 About Bajaj Energy Limited

Bajaj Energy limited (BEL) is one of the largest private sector thermal generation companies in Uttar Pradesh and is involved in developing, financing and operating thermal power plants in India. BEL has a total installed capacity of comprising 450 MW from five operational plants of 90 MW each owned and managed by Bajaj Energy Limited (BEL), spread across the state of Uttar Pradesh.

BEL has entered into long-term fuel supply agreements with Central Coal Fields Limited & Northern Coal Field, subsidiaries of Coal India Limited & Northern Coal Field, for the supply of coal to the BEL Power Plants. The BEL Power Plants have been fully operational since 2012 and possess an operational track record of more than eight years.

1.7 About National Productivity Council (NPC)

National Productivity Council, an autonomous body under the Ministry of Industry, Government of India, was established in the year 1958, to promote productivity culture in the country. It is a tri-partite, non-profit making organization, with equal representation from the government, employers and workers organizations, apart from technical and professional institutions and other interests on its governing council. NPC, as an apex body, provides consultancy and training in various fields including Energy Management, over the past five decades and undertakes research in the areas of productivity. NPC has 12 regional offices in India and a total strength of about 135 professionals/consultants. NPC with its regional offices located in major cities / industrial cities has unique advantages in carrying out multi location assignments and assignments on all India basis.

Energy Management group of NPC has a total strength of around 30 fulltime EM professional out of which around 18 are certified Energy Auditors and about 10 are accredited energy auditors from Bureau of Energy Efficiency. NPC provides consultancy as well as capacity building services to several international, national as well as unit level clients. EM Group offers consulting

services in various sectors including industry, power generation, distribution, commercial, agriculture and SME clusters.

1.8 About the Plant

The total installed capacity of BEL, Maqsoodapur plant is 90 MW (2x45MW).

The major performance parameters of the Plant for a representative day during 3rdJuly 2020 are:

Table 5: Performance Parameters of the plant

Parameters	Units	Unit 1 (45MW)	Unit 2 (45MW)	Station
At partial loading				
Avg. Generation (3rd July 2020)	MW	38.17	38.50	76.67
Avg. daily Steam (Boiler)	TPD	3746	3563	7309.00
DM Make-up	TPD	5.00	5.00	10.00
DM Make-up	TPH	0.208	0.208	0.42
% of DM Make-up (w.r.t. actual steam flow)	%	0.13%	0.14%	0.14%
% of DM Make-up (w.r.t. design steam flow)	%	0.11%	0.11%	0.11%

Observation

1. DM make-up % is very less compared to other units and at par with the best in the industry. It will directly improve the unit heat rate.

2. Existing System

2.1 Installed Capacity

BEL, Maqsoodapur plant has an installed capacity of 90 MW as per the details given below:

2 x 45 MW	=	90 MW
Total	=	**90 MW**

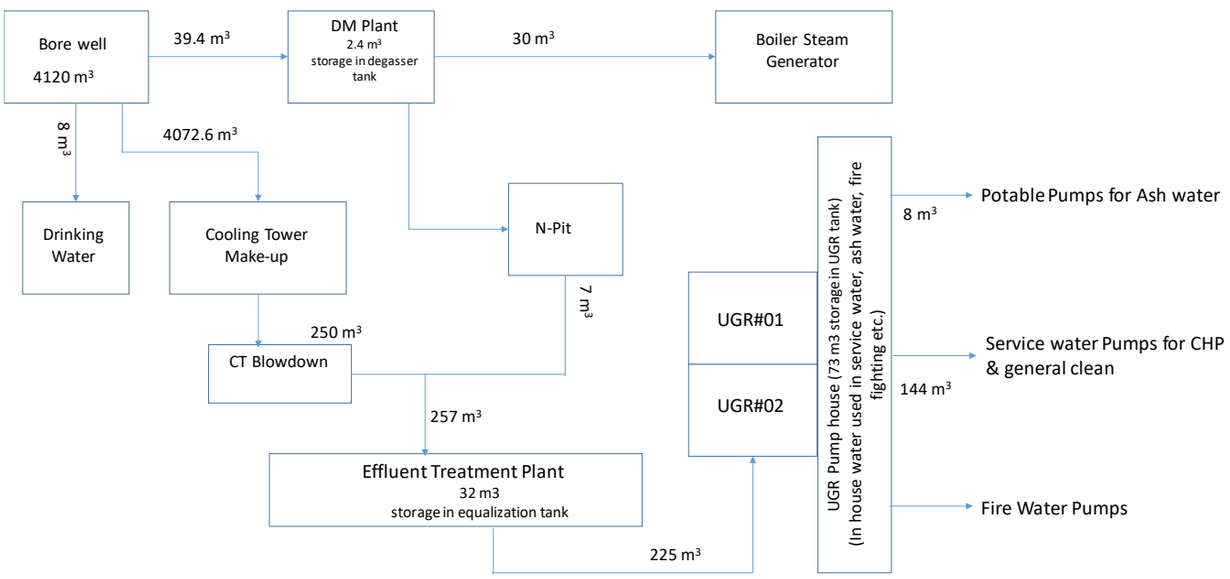
The following section describes the specifications of equipments related to various water systems in the plant.

2.2 Overall Water Balance Summary of the plant:

Table 6: Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Total inflow**				
1.1	Total inflow	171.67	4120.00		
2	**Total outflow**				
2.1	DM plant inlet	1.64	39.40		
2.2	Drinking water	0.33	8.00		
2.3	CT make-up {1.1 - (2.1+2.2)}	169.69	4072.60		
	Total outflow	171.67	4120.00		

2.3 Overall Water Balance Diagram of the plant on particular day:



2.4 Bore well water and DM Plant

Maqsoodapur plant draws raw water from underground water by two bore well pumps, then it is pumped to DM plant for DM water generation, potable water for drinking water and cooling water make-up.

Table 7: Water Consumption and Balancing

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Borewell Pump - 1 (near DM plant)	140	8.00	1	47	1120		
2	Borewell Pump - 2 (near UGR)	160	18.75	1	125	3000		
1	Total Inflow of Raw water Make-up (1+2).				172	4120		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	20	2.0	1	1.64	39.4		
	Inflow of DM plant				**1.62**	**39**		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	12	2.5	1	1.25	30		
2.2	N-pit Pump	35	0.2	1	0.3	7		
2.1.1	DM Transfer Pump - 1	44	0.5	1	0.91	22		VFD operated
	Outflow of DM plant (2.1+2.2)				1.5	37		
	Difference				0.10	2.40		Storage in Degasser tank

Table 8: Assessment of Water Pumps Performance

Particulars	Unit	Bore well Pump - 1 (Near DM Plant)	Bore well Pump - 2 (Near UGR)
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	22	18.5
Rated Voltage	V	415	415
Full Load Amps	A	43	38
Efficiency (η)	%	90	85
Speed	RPM	2850	2850
Pump			
Head	m	25	25
Water flow rate	m^3/hr	180	180
Efficiency (η)	%	-	-
Speed	rpm	2895	2895
Measured Parameters			
Suction pressure	kg/cm^2	0.0	0.0
Discharge pressure	kg/cm^2	1.2	1.6
Water flow rate	m^3/hr	140	160
Power input	kW	24	18
Motor Efficiency (estimated)	%	85	85
Calculation			
Suction head	m	0	0
Discharge head	m	12	16.2
Total head	m	12	16.2
Water flow rate	m^3/s	0.039	0.044
Density of water	kg/m^3	1000	1000
Hydraulic power	kW	4.58	7.06
Shaft power	kW	20.00	14.99
System efficiency	%	19.45	40.06
Pump efficiency	**%**	**23%**	**47%**
% loading of flow	%	78%	89%
% loading of head	%	48%	65%
% Motor loading	%	96%	81%
SEC (kWh/m3)		0.17	0.11

Analysis and observation

1. **Bore well pump- 1 (near DM plant):** Pump efficiencies are found to be much lower (23%) compared to the design value.
2. **Bore well pump- 2 (near UGR):** Pump efficiencies are found to be lower (47%) than the design value.

2.5 Effluent Treatment Plant (ETP) and Underground reservoir (UGR) tank:

Cooling tower blow down and "N" pit water is sent to ETP for treatment and after treatment the clean water pumped into the UGR tank. UGR water use to:

1. Horticulture water;
2. Ash water;
3. Service water and
4. Fire water

Table 9: Water Consumption and Balancing (ETP & UGR Tank)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	Inflow of Effluent Treatment Plant (ETP)							
1.1	ETP inlet (CT blowdown)	50	5.0	1	10.41	250		
1.2	N-pit				0.3	7		
	Inflow of ETP				10.70	257		
2	Outflow of ETP to UGR tank							
2.1	ETP Outlet (Filter feed pump)	50	4.5	1	9.38	225		
	Outflow of ETP				9.38	225		
	Difference				1.33	32.00		Storage in equalization tank
1	Inflow of underground reservoir (UGR) tank							
1.1	UGR inlet				9.38	225		
	Inflow of UGR				9.38	225		
2	Outflow of underground reservoir (UGR) tank							
2.1	Service Water for CHP, Cleaning and horticulture	72	2.0	1	6	144		Average Yearly running hours 2 Hrs.
2.2	Potable	16	0.5	1	0.33	8		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Pump for Ash water							
	Outflow of UGR				6.33	152		
	Difference				3.04	73.00		Storage in UGR tank

Table 10: Assessment of Water Pumps Performance

Particulars	Unit	Service Water Pump	Potable Water Pump
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	75	5.5
Rated Voltage	V	415	415
Full Load Amps	A	128	10.4
Efficiency (η)	%	93	85
Speed	RPM	1480	2850
Pump			
Head	m	70	30
Water flow rate	m^3/hr	250	25
Efficiency (η)	%	-	-
Speed	rpm	1416	2764
Measured Parameters			
Suction pressure	kg/cm^2	-0.3	-0.30
Discharge pressure	kg/cm^2	8.7	4.0
Water flow rate	m^3/hr	72	16
Power input	kW	33	4
Motor Efficiency (estimated)	%	90	81
Calculation			
Suction head	m	-3	-3
Discharge head	m	87	40
Total head	m	90	43
Water flow rate	m^3/s	0.020	0.004
Density of water	kg/m^3	1000	1000
Hydraulic power	kW	17.66	1.87

Particulars	Unit	Service Water Pump	Potable Water Pump
		Pump	Pump
Shaft power	kW	29.55	3.29
System efficiency	%	53.78	46.17
Pump efficiency	**%**	**60%**	**57%**
% loading of flow	%	29%	64%
% loading of head	%	129%	143%
% Motor loading	%	41%	63%
SEC (kWh/m3)		0.46	0.25

Analysis and observation

1. **Service Water Pump (from UGR):** Pump efficiency is found to be lower (60%) compared to design value of 75%. The operational factors influencing efficiency variation are felt to have lower loading on flow and higher loading on head.
2. **Potable Water Pump (from UGR):** Pump efficiency is found to be much lower (57%) compared to design value. The operational factors influencing efficiency variation are felt to have lower loading on flow and higher loading on head.

2.6 Circulating Water (CW) Pumps, Auxiliary Cooling Water (ACW) Pumps and Auxiliary Cooling Water (ACW) Booster Pumps

CW pumps and ACW pumps supply water from cooling tower cold basin to the condenser from where the return water is sent to cooling tower. There are three CW pumps, of which one pump is in operation during study period (at 55% loading) and each Pump capacity is of 8600 m^3/hr.

There are two CW booster pumps provided for each unit to meet the auxiliary equipment cooling water requirements, of which generally one pump is in operation. These pumps take suction from condenser cooling water inlet header and after heat exchange duty the water is returned to condenser cooling water outlet header.

Operational schedule of the CW pumps and CW booster pumps at different unit loading condition:

- At partial load (55%) = 1 CWP + + 1 ACW Booster pump are in operation.
- At full load (100%) = 2 CWPs + 1 ACWP Booster pumps are in operation.

Water distribution circuit diagram is given below:

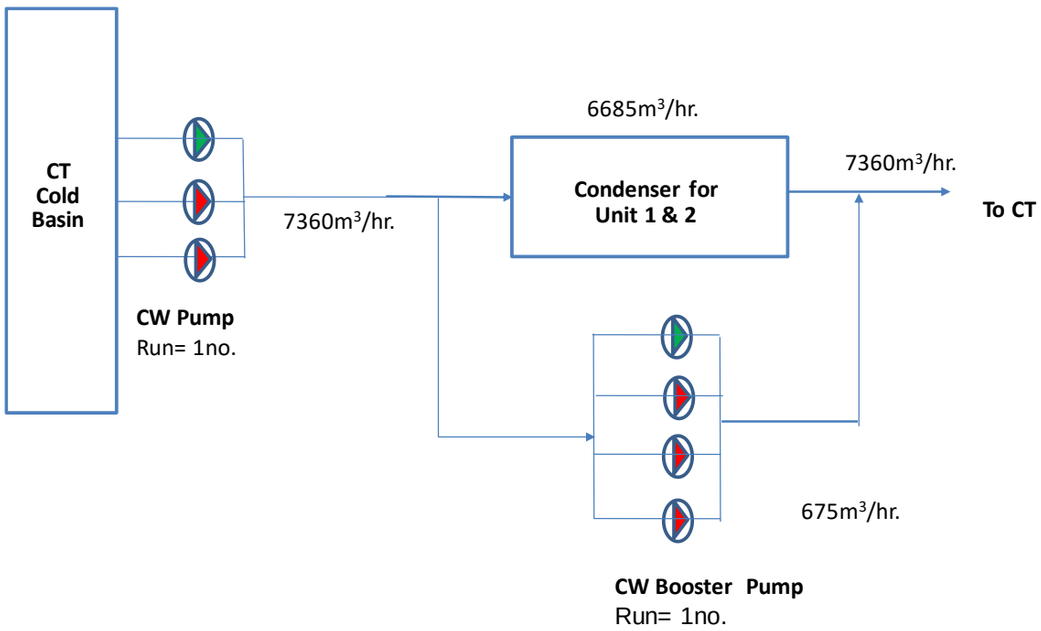


Table 11: Water Consumption and Balancing (CW System)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Cooling Water (CW) System**						
1.1	CW Pump-1	7360	24	1	7360	176640	* 1 CWP + 1 ACW booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW. * 2 CWPs + 1 ACW booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1a	Total Cooling water flow at partial load (55%).				7360	176640	* 1 CWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
1b	Total Cooling water flow at full load (100%).				14720	353280	* 2 CWPs + 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
** 1 CWP + 1 ACW Booster pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.* ** 2 CWPs + 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.*							

Table 12: Water Consumption and Balancing (ACW System)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**ACW Booster Pumping System**						
1.1	ACW Booster Pump 1 (U#1)	675	24	1	675	16200	*1 ACW Booster pump is run at partial load (55%) = 55% x 2x45MW = 49.5MW. * 1 ACW Booster pumps are run at full load (100%) = 100% x 2x45MW = 90MW.
1	Avg. of ACW Booster pump	675			675	16200	
	CW Flow to Condenser (by calculation)						
1	CW flow to Condenser at partial load (55%) = 55% x 2x45MW = 49.5MW.	6685	24		6685	160440	* 1 CWP - 1 ACW Booster Pump are run at partial load (55%) = 55% x 2x45MW = 49.5MW.
2	CW flow to Condenser at full load (100%) = 100% x 2x45MW = 90MW.	14045	24		14045	337080	* 2 CWPs - 1 ACWP Booster Pump are run at full load (100%) = 100% x 2x45MW = 90MW.

Table 13: Assessment of Water Pumps Performance

Particulars	Unit	CW Pump - 1	ACW Booster - 1
		Pump	Pump
Design Details			
Motor			
Rated Power	kW	700	55
Rated Voltage	V	11000	415
Full Load Amps	A	47	96
Efficiency (η)	%	95	93
Speed	RPM	745	1470
Pump			

Particulars	Unit	CW Pump - 1	ACW Booster - 1
		Pump	Pump
Head	m	23.16	35
Water flow rate	m^3/hr	8600	500
Efficiency (η)	%	85	-
Speed	rpm	745	1416
Measured Parameters			
Suction pressure	kg/cm^2	0.0	1.4
Discharge pressure	kg/cm^2	1.65	3.0
Water flow rate	m^3/hr	7360	675
Power input	kW	568	52
Motor Efficiency (estimated)	%	90	89
Calculation			
Suction head	m	0	14
Discharge head	m	16.5	30
Total head	m	16.5	16
Water flow rate	m^3/s	2.044	0.188
Density of water	kg/m^3	1000	1000
Hydraulic power	kW	330.92	29.43
Shaft power	kW	511.27	46.27
System efficiency	%	58.25	56.60
Pump efficiency	**%**	**65%**	**64%**
% loading of flow	%	86%	135%
% loading of head	%	71%	46%
% Motor loading	%	77%	88%
SEC (kWh/m3)		0.08	0.08

Analysis and observation

1. **Circulating Water (CW) Pumps (No: 1):** Pumps efficiency of 65% is found to be much below as compared to design value 85%. The operational factors influencing efficiency variation is felt to have lower loading on flow and head.
2. **ACW Booster Pump1:** Pumps efficiency of 64% is found to be much below as compared to design value. The operational factors influencing efficiency variation is felt to have higher loading on head and lower loading on head.

2.7 Cooling Tower System

Performance Evaluation of Cooling Tower at partial loading (56%) is given below:

At Partial Loading (56%) = 56% x (2x45MW) = 50MW

Table 14: Performance Evaluation of Cooling Tower

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
	Cooling Tower (CT) System					
1	Unit Load	MW	25	25	50	At NCR 45MW as per design.
	% of NCR	%	56%	56%	56%	
2	CW flow	m^3/hr	7360		7360	
3	CW inlet water temperature	^oC	33	32.92	33	
4	CW outlet water temperature	^oC	42	43.1	43	
5	Temperature difference	^oC	9	10	10	10^oC as design.
6	DBT at ambient	^oC			27	
7	WBT at ambient	^oC			26	
8	C.O.C				6	
9	Evaporation loss	m^3/hr			110	
		%			1.49%	As per design 1.67%.
10	Blow down as per calculation	m^3/hr			22	
11	Total CT make-up as per calculation	m^3/hr			131	
12	Range	^oC			10	
13	Approach	^oC			6.76	4^oC as per design
14	Effectiveness				0.59	

2.8 Condenser System

Performance Evaluation of Condenser System at partial loading (55%) is given below:

At Partial Loading (56%) = 56% x (2x45MW) = 50MW

Table 15: Performance Evaluation of Condenser System

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Condenser System					
1	Unit Load	MW	25	25	50	At NCR 45MW as per design.
	% of NCR	%	56%	56%	56%	
2	CW flow of condenser (by calculated)	m^3/hr	6685		6685	

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
3	CW inlet water temperature	^{O}C	33	32.92	33	32^{O}C as design.
4	CW outlet water temperature	^{O}C	42	43.1	43	42^{O}C as design.
5	Temperature difference	^{O}C	9	10	10	10^{O}C as design.
6	Condenser Thermal Load as run condition	million kCal/hr			65	

3. Environmental Compliances Related to Water

Being a reputed thermal power generating company of Uttar Pradesh state, Maqsoodapur Unit of Bajaj Energy Limited (BEL) always makes it a point to fulfill the environmental compliances as per the guidelines given by **Central Ground Water Authority (CGWA)** and **Uttar Pradesh Pollution Control Board (UPPCB)**.

Table 16: Compliances related to Water

Sl. No.	Condition	Status/ Compliance	Remarks
1	The plant may extract 6,984 m3/day (≤20,95,850m3/year) with two existing bore wells.	The plant is maintaining the water withdrawal limit	Checked during visit
2	Digital Meters must be installed at each bore well and log book must be maintained	Digital meters are installed for both bore well and log book is maintained	
3	Ground water level monitoring through existing piezometers.	Plant is continue monitoring the ground water level	Ground water level data for last one year is attached in Annexure-I
4	Recycling and reuse of waste water	Complied	-

Water Saving Potential at Bajaj energy units of having capacity (2 x 45 MW each)		
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m^3/MWH.		
While as per CGWA NOC BEL plants are entitled for daily ground water withdrawal of 6984 m^3/day which is equivalent to 3.23 m^3/MWH at station full load running condition. This withdrawal limit is already less than MOEF norms		
Recently CGWA has issued guideline dated 24 sept 2020 which states as following "All industries abstracting ground water in excess of 100 m^3/day shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means. "		
Therefore we have worked out the maximum water saving potential in all BEL stations and also worked out best specific water consumption which can be achieved by BEL stations		
Specific water consumption As per MOEF (m^3/MWH)	3.50	
Approved water quantity per day by CGWA(m^3/day)	6984	
Specific water consumption As per CGWA Approved water quantity (m^3/MWH)	3.23	
A. Water consumption Break up at full load at	Quantity	Remarks

COC-7	(m3)	
Evaporation Loss (m^3/Day)	5914	
Drift Loss (m^3/Day)	6	
COC	7	
Blow Down loss(m^3/Day)	986	
Cooling Tower Make up(m^3/Day)	6906	
Potable Water Quantity (m^3/day)	10	
Evaporation loss from water reservoir (m^3/day)	3	
DM Plant Make up(m3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	6984	
Horticulture (m^3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (m3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption

B) Saving Potential at Full Load Condition

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 591 M3 Water may be utilised as CT Make up

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	591	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(m3/Day)	6314	
DM Plant Make up(M3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (m3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (m3/Day)	50	
Total Bore well water required(m3/day)	6443	
Water saving from approved Quantity (m^3/day)	541	
% Water Saving from approved Quantity)	7.8%	

Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9

Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	5914	

Drift Loss (M3/Day)	6	
COC	9	
Blow Down loss(M3/Day)	739	
Water Being used as CT make up from UF RO System(70% recovery)	517	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	6142	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	6270	
Water saving from approved Quantity (M3/Day)	714	
% Water Saving from approved Quantity	10.2%	
Maximum Possible water saving is 10.20%		

We have also worked water saving potential at 80% Loading factor.		
Specific water consumption As per MOEF (M3/MWH)	3.50	
Proportionate water quantity at 80% Loading Factor per day(m3/day)	5587	80% quantity
Specific water consumption As per CGWA Approved water quantity (M3/MWH)	3.23	
C. Water consumption Break up at 80% load at COC-7	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	7	
Blow Down loss(M3/Day)	789	
Cooling Tower Make up(M3/Day)	5525	
Potable Water Quantity (m3/day)	10	
Evaporation loss from water reservoir (m3/day)	3	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	5603	
Horticulture (M3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (M3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption
D) Saving Potential at 80% Load Condition		

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7		
Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 414 M3 Water may be utilised as CT Make up		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	473	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	5052	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5180	
Water saving from approved Quantity (M3/Day)	407	
% Water Saving from approved Quantity)	7.3%	
Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9		
Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	9	
Blow Down loss(M3/Day)	591	
Water Being used as CT make up from UF RO System(70% recovery)	414	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	4914	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5042	
Water saving from approved Quantity (M3/Day)	545	

% Water Saving from approved Quantity	9.8%	
% Water Saving from approved Quantity : 9.8%		

Conclusion: It is seen from the above working that 20% reduction target is difficult to achieve in thermal power plants.

Apart from the above, plant will take up annual water audit and adopt measures to reduce fresh water consumption, monitor the ground water and will submit all the data to the concerned authority.

Table 17: Plant Production and Consumption Details

Sl. No.	Description	2019-20 (July, 2019-June, 2020)
1	Total Power Generation (MWh)	73805
2	Total Raw Water Consumption (m3)	224829
3	Specific Raw Water Consumption (m3/MWh)	3.05

Table 18: Treated Water Parameters

Sl. No.	Location	Parameter	Unit	Actual Value	CPCB Standard Value (Inland Surface Water)
1	ETP I/L	pH	-	7.16	-
2		Total Suspended Solid (TSS)	mg/l	74	-
3		Bio-chemical Oxygen Demand (BOD)	mg/l	52	-
4		Chemical Oxygen Demand (COD)	mg/l	260	-
6	ETP O/L	pH	-	7.46	5.0-9.0
7		Total Suspended Solid (TSS)	mg/l	24	100
8		Bio-chemical Oxygen Demand (BOD)	mg/l	19	30
9		Chemical Oxygen Demand (COD)	mg/l	60	250

*Sample collected on 14/06/2020 by third party. Testing was conducted by third party.

Table 19: Ground Water Parameters

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
1	Colour	HZN	<5.0	5 max	15 max
2	Odour	-	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1.0	1 max	5 max
5	pH	-	7.42	6.5-8.5	No Relaxation

6	Total Hardness	mg/L	174	200 max	600 max
7	Iron (Fe)	mg/L	0.15	0.3 max	No Relaxation
8	Chloride (Cl)	mg/L	106	250 max	1000 max
9	Residual Free Chlorine	mg/L	<0.2	0.2 min	1
10	Sulphates (SO_4)	mg/L	56	200 max	400 max
11	Total Alkalinity	mg/L	186	200 max	600 max
12	Fluoride (F)	mg/L	0.16	1.0 max	1.5 max
13	Total Dissolved Solid (TDS)	mg/L	370	500 max	2000 max
14	Total Coliform	MPN/100ml	Not Detected	-	-
15	E coli	/100ml	Not Detected	-	-

***as per IS 10500**

Sample collected on 14/06/2020 by third party. Testing was conducted by third party.

From the above tables, it is evident that the plant is complying with all parameters mentioned by CGWA and UPPCB.

4. Water and Energy Conservation Options

4.1 Install RO plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.

4.2 Pump Efficiency Improvement by Overhauling of CW pump 1.

4.3 Replacement of Underperforming Pumps of Bore well pumps (both) and Potable pump by Energy Efficient Pumps and Motors with VFD drive.

4.4 Pump Efficiency Improvement by Overhauling of ACW Booster pump 1.

5. Rain Water Harvesting

5.1 Rain Water Harvesting Programme

Rain Water Harvesting, is an age-old system of collection of rainwater for future use. But systematic collection and recharging of ground water, is a recent development and is gaining importance as one of the most feasible and easy to implement remedy to restore the hydrological imbalance and prevent a crisis. Rain water harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later. Rooftop rainwater harvesting: Rooftop rainwater from the administrative office area, factory area and other plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells.

The recharge wells will be provided with recharge bores to facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside the recharge well ensure efficient filtration. In addition to this Rain water harvesting and groundwater recharge structures will also be constructed outside the plant premises to augment the ground water level.

In scientific terms, water harvesting refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage and all other hydrological studies and engineering inventions, aimed at conservation and efficient utilization of the limited water endowment of physiographic unit such as a watershed. Rain is a primary source of water for all of us. There are two main techniques of rainwater harvesting:

- Storage of rainwater on surface for future use
- Recharge to groundwater

Directly collected rainwater can be stored for direct use or can be recharged into the groundwater. All the secondary sources of water like rivers, lakes and groundwater are entirely dependent on rain as a primary source.
Rainwater harvesting structures shall be provided to recharge the groundwater resources in the region. The run-off water from the roof of the structures and paved areas shall be collected through storm water drainage system and led to rain water harvesting structure.

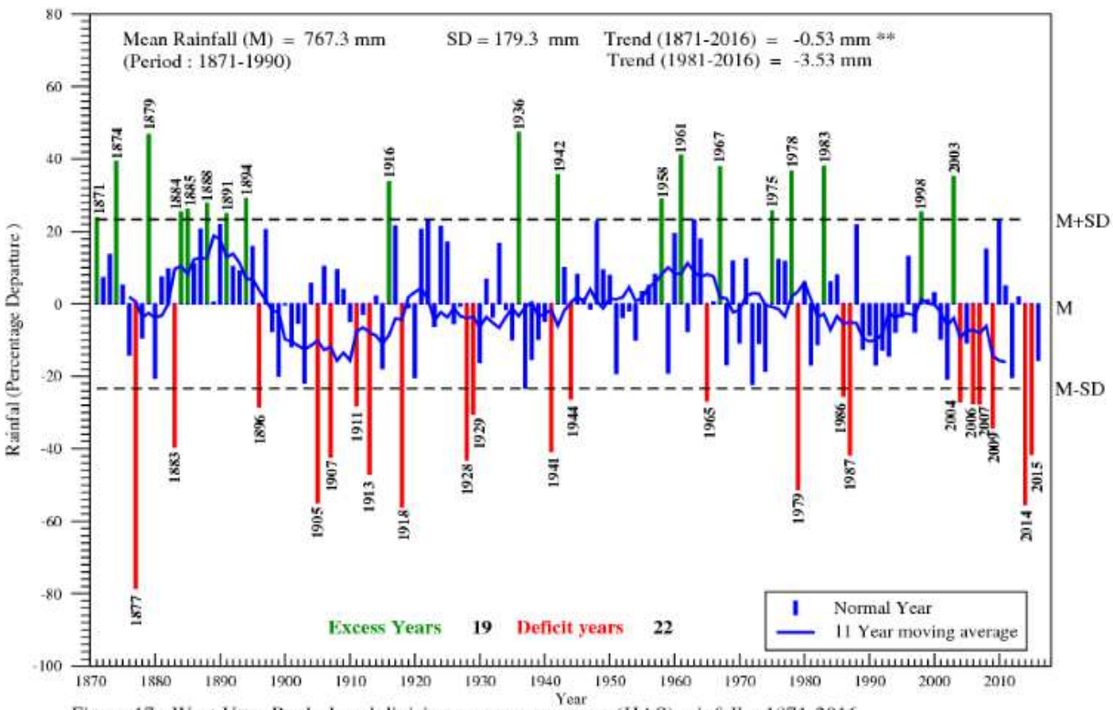


Figure 17 : West Uttar Pradesh subdivision summer monsoon (JJAS) rainfall : 1871-2016
(Trend - mm/year, *, ** and *** significance at 10%, 5% and 1% level, rainfall data for the period 1871- 2012 based on 306 stations and 2013-2016 based on IMD subdivisional rainfall)

Annual Rain Fall	***767.3 mm (West UP)***

5.2 Rainwater Harvesting Facilities

For augmenting the ground water resources in the plant premises, number of rainwater harvesting pits will be constructed and the internal drains where excess rain water flowing in drain will be diverted to these pits. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. The roof top water will be routed to the storm drains. This will result in increase in groundwater tables and to some extent the improvement of ground water quality.

Rainwater Harvesting in Maqsoodapur unit will be very useful. With respect to the physical alternatives to fulfil sustainable management of freshwater, there are two solutions - first reuse the rainwater at washroom, gardening and the second is for ground water recharge.

The size and the locations of rainwater harvesting pits will be decided during detailed engineering of the project.

Run off from the proposed project site is calculated using rational formula:

$$Q = C \times I \times A$$

Q = Run-off in m3/hr

A = Catchment Area (Sq.m)

C = Coefficient of Run-off

I = intensity of Rainfall in mm/yr

5.3 Rain Water Harvesting Potential Calculation

Table 20: Rainfall Data

Particulars	Unit	Values
Intensity of rainfall (in mm) based on IMD Data	mm/yr	767.3
No. of rainy days		48
Rainfall per day	mm/day	15.985
	m/day	0.0160

Table 21: Roof Top Area

Description	Unit	Values									
		TG Building	Deaerator Floor	Stores	Switchyard control room	DM Plant MCC & Lab	ESP Control room	CHP Control room	UGR MCC	Boiler roof	Unit Panel Room
Drainage area in m2	m2	2170	860	225	84	120	250	160	60	500	60
Coefficient of run-off	-	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Runoff	m3/day	29.485	11.685	3.057	1.141	1.631	3.397	2.174	0.815	6.794	0.815
Total runoff	m3/day	**60.995**									

Table 22: Storage Potential**

Location	Unit	Values**
TG Building	m3/day	11.79
Deaerator Floor	m3/day	4.67
Stores	m3/day	1.22
Switchyard control room	m3/day	0.46
DM Plant MCC & Lab	m3/day	0.65
ESP Control room	m3/day	1.36
CHP Control room	m3/day	0.87
UGR MCC	m3/day	0.33
Boiler roof	m3/day	2.72
Unit Panel Room	m3/day	0.33
Total	**m3/day**	**24.40**

***Considering collection efficiency to be 40%*

5.4 Recommendation for use of rain water

- The collected rain water can be pumped to a combined filtration system for removal of suspended solids and other impurities. Sand filter and activated carbon filter can be installed for filtration of rainwater before reuse.
- The following overarching goals apply to the implementation of rain water harvesting and reuse systems:
  - ✓ Reduction of rain water pollutant loads and flows to surface waters, helping achieve local rain water management requirements;
  - ✓ Reduction of the demand on potable water sources; and
  - ✓ Reduction of stress on the existing water supply infrastructure.
- Additionally, rain water harvesting and reuse systems can be used to help achieve Leadership in Energy and Environmental Design (LEED) and other sustainable design credits related to rain water quantity and quality as well as water efficiency.
- Although rain water harvesting and reuse systems appear to be a viable alternative to help achieve required rain water management standards as well as reducing the demand on the potable water supply, they are not without concerns. Concerns include human exposure to pathogens, cross-contamination of the potable water supply and exposure due to ingestion of crops potentially contaminate harvested rainwater for bacteriological parameters and other organic load before reuse in processes.

6. Motor Load Survey

Table 23: Motor Load survey

Borewell Pump 1									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	22.0	415	43	90	426	36.83	0.87	23.53	96.28
Borewell Pump 2									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	18.5	415	38	90	420	27.97	0.87	17.63	85.78
DM Transfer Pump -1									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	15.4	90.1	420	16.23	0.60	7.12	85.59
Service Water Pump									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	75.0	415	128	93	420	55.00	0.82	32.83	40.71
Potable Water Pump									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	5.5	415	10.4	85	421	6.97	0.80	4.06	62.76
Filter Feed Pump									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	9.3	415	16.8	85	419	17.30	0.82	10.30	94.17
CW Pump - 1									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	47	95	**11160**	**37.36**	**0.79**	**568.08**	77.10
ACW Booster Pump - 1									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	93	**435**	**88.17**	**0.78**	**51.99**	87.92
N-Pit Pump									
Phase	Rated Parameters				Measured Parameters				
Ref.	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	86	**428**	**6.00**	**0.80**	**3.55**	40.66

7. Check list for Self-Assessment for Determining Water Efficiency for Facility Managers

Sl. No.	Activities	Descriptions	Frequency
1	Monitoring of cycle of concentration	Cooling towers are normally designed for a COC of 5 with requirement of makeup water typically about 2.1% of water flow (comprising of 1.7% evaporation loss, 0.05% drift loss and 0.35% as blow down). By increasing the COC, the blow down quantity can be reduced by external water treatment and adding water treatment chemicals, COC of even 10 can be reached. Increasing COC can result in significant savings of water as the blow down will be further reduced by suitably improving the chemical regime of circulating water, if feasible	Weekly
2	Monitoring of leaks and overflows	Leakages from valves, taps, fire fighting hoses, underground fire fighting lines, cooling tower basin, gardening hoses area also a source of water loss. There lies a possibility of reducing the water consumption by plugging the leakages. For every litre of water lost in a water network, another litre of water has to be treated and pumped through the distribution network to compensate.	Weekly
3	Installation of Pressure Gauges and Monitoring	In both the suction and discharge side of the circulating pumps. If the gauge indicates the pressure (or pressure drop) in the process, that information is valuable only if one can do something about it like cleaning a filter.	Daily
4	Calibration of Water flow meters	Annual Calibration of all the water flow meters and pressure gauges must be ensured. A calibrated instruments ensures that the measurements and readings taken are authentic and hence can be used for reference for other study very easily	Annual
5	Operational hours of the circulating pumps to be monitored	In the log book on a continuous basis. Inclusion of operational hours in the log book keeps a track record of the running hours of individual pumps and hence is helpful to optimize the pumping operations if required.	Daily
6	Water quality test report of the Cooling Tower basin	To be conducted in shift-wise. This is important to ensure that COC of the cooling tower is maintained at the desired level to reduce the cooling tower blow down.	Shift wise
7	Maintenance of log book of the cooling tower make up water flow and soft plant water flow	A log book of the cooling tower make up water flow and soft plant water flow In the cooling tower to be maintained. Soft water being a costly water should be monitored along with the makeup water for cooling tower.	Daily

Sl. No.	Activities	Descriptions	Frequency
8	Monitoring the amount of discharge water	Determining whether discharge from any one operation can be substituted for fresh water supply to another operations. In many cases, where water quality is not much of significance but is only used for washing and cooling purposes, the use of discharge water is recommended over fresh water.	Daily
9	Reuse of wastewater after treatment	Handling waste materials in a dry mode wherever possible. Use of even waste water should be minimized as far as possible.	Daily
10	Monitoring of raw water consumption	Reduction in water consumption in processes by closely monitoring of timings of processes and water circulation.	Daily
11	Monitoring of Rainwater collected in reservoir/ pond	Collection of rain water from factory premises to reservoir / ponds for future use to reduce the raw water intake	Daily

Annexure-I

Ground Water Level Monitoring Data for BEL Maqsoodapur Unit are given below:

Period	Ground Water Level (m)
July, 2019	1.27
Aug, 2019	2.22
Sep, 2019	1.52
Oct, 2019	2.17
Nov, 2019	1.87
Dec, 2019	2.16
Jan, 2020	3.03
Feb,2020	2.78
May, 2020	2.35
Jun, 2020	2.30
July, 2020	2.20

Benchmarks

The flowing table presents the Water Consumption Norms of few countries and water consumption levels of some of major Thermal Power Plants in the country:

S No	Reference	Norm
1.	USA (***Source:*** *National Renewable Energy Laboratory Report on Consumptive Water Use for US power Production*)	1.8 Ltrs/kWh
2.	South Africa (***Source:*** *MIT Report on Water Footprint of Electric Power Generation*)	2.02 Ltrs/kWh
3.	National Norm for 500MW Indigenous Coal Based Plant with wet Cooling Tower (***Source:*** *CEA Report minimization of water requirement in coal based Thermal Power station*)	3.0 ltr/kWh
4	National Norm 660MW Coal Based Super Thermal Power plant with ash water recycling (***Source:*** *FICCI Bulletin on Energy Efficiency 2006*)	3.0 -4.0 m3/MW
5	National Norm 660MW Coal Based Super Thermal Power plant without ash water recycling. (***Source:*** *FICCI Bulletin on Energy Efficiency 2006*)	4.0 -4.5 m3/MW
6	Water Consumption in Some of the Power plant in India (Source of data: Declared by the plant)	
(a)	Vidhyachal Stage I (6 X 210MW) (Raw water consumption is 4000m3/hr with AWRS in operation).	3.17m3/MW
(b)	Vidhyachal Stage II (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(c)	Vidhyachal Stage III (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(d)	Rihand thermal Power Station-Stage I & II(2 X 500MW + 2 X 500 MW) with AWRS in operation	3.21

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Report
on
Water Balance Study
at
Bajaj Energy Limited
(Utraula Unit)

Submitted to

Bajaj Energy Limited

Utraula Unit

Utraula, Distt. Balrampur

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- ***Mr Amitabha Jana,***

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National Productivity Council

Water Audit Team

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Executive Summary

As part of on-going efforts to reduce Water Consumption, the progressive management of Bajaj Energy Limited approached NPC to carry out the Water Balance study of its 5 plants in Uttar Pradesh that are Barkhera (Pilibhit), Maqsoodapur (Shahjahanpur), Khambarkhera (Lakhimpur), Kundarkhi (Gonda) and Utraula (Balrampur). The study is intended to be a Detailed Water audit study of the above Plants regarding their existing operating status of water use and suggesting relevant water conservation measures to be adopted to bring down the water consumption in the plant.

As a result, NPC team has carried out the field visit for water audit study at 5 Power Plants of Bajaj Energy Limited in July 2020. Available data pertaining to various key parameters were collected from the concerned officials. The necessary field measurements were carried out during the field study for assessing the existing water use scenario and to identify the water conservation measures. The report has been prepared for Utraula Plant based on the data/information collected/measurement taken by the NPC team and observations made during the field study are discussed in this report.

The following recommendations and findings made as per the observation of the study team:

Water Usage Scenario

The source of water is from two numbers of bore well pumps installed in the plant.

Specific water consumption is established on the basis of historical data collected from the plant and the same is tabulated below:

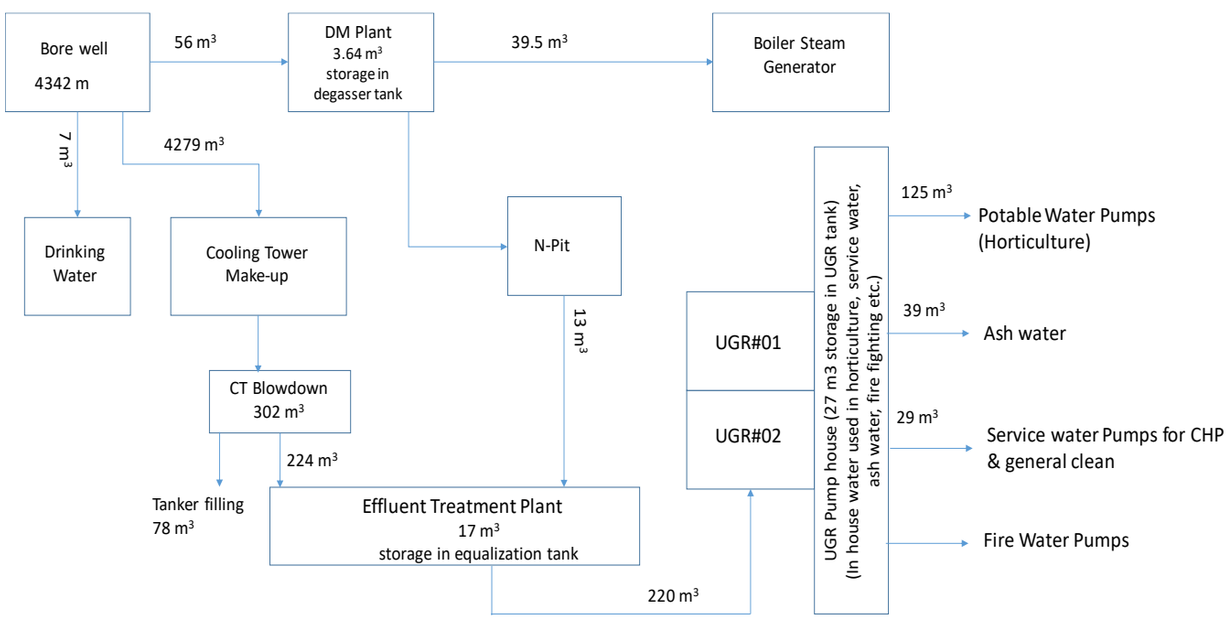
Table 1: Specific Water Consumption

Particulars	Unit	Value	Standard
Generation of 2 units (@45MW) *(July 2019 to June 2020)*	MU	127.46	Standard Specific water consumption = 3.5 m^3/MWh.(as per MOEF notification dated 7th Dec'15)
Water consumption *((July 2019 to June 2020)*	m^3	413810	
Specific water consumption (m^3/MWh)	m^3/MWh	3.25	

** Period: July 2019 to June 2020.*

** Standard values for close loop circuil system.*

Actual measurement of Total water distribution on particular day at different usage areas are illustrated in the diagram below:


Bore well
4342 m
56 m³
DM Plant
3.64 m³
storage in
degasser tank
39.5 m³
Boiler Steam
Generator
7 m³
4279 m³
Drinking
Water
Cooling Tower
Make-up
N-Pit
13 m³
CT Blowdown
302 m³
224 m³
Tanker filling
78 m³
Effluent Treatment Plant
17 m³
storage in equalization tank
220 m³
UGR#01
UGR#02
UGR Pump house (27 m3 storage in UGR tank)
(In house water used in horticulture, service water,
ash water, fire fighting etc.)
125 m³
Potable Water Pumps
(Horticulture)
39 m³
Ash water
29 m³
Service water Pumps for CHP
& general clean
Fire Water Pumps

Water Consumption & Water Balancing

Water consumption at different sections of the plant is given below.

Table 2: Overall Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	180.92	4342.16	
2	**Total outflow**			
2.1	DM plant inlet	2.33	56	
2.2	Drinking water	0.29	7.00	
2.3	CT make-up {1.1 - (2.1+2.2)}	178.30	4279	
	Total outflow	180.92	4342.16	

Table 3: Bore well water pumps to DM Plant

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (at near HR office)	138	14.32	1	82	1976		
2	Bore well Pump - 2 (at near CT)	169	14.00	1	99	2366		
1	Total Inflow of Raw water (1+2).				181	4342		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	16	3.5	1	2.3	56		
	Inflow of DM plant				2.3	56		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	11	3.5	1	1.6	39		
2.2	N-pit Pump (to ETP inlet)	28	0.5	1	0.5	13		
2.1.1	DM Transfer Pump - 1	22	1.0	1	0.9	22		VFD Operated

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
								Pump
	Outflow of DM plant (2.1+2.2)				2.2	52		
	Difference				0.15	3.64		Storage in degasser tank

Table 4: Effluent Treatment Plant (ETP) and Underground reservoir (UGR)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1a	ETP inlet (CT blowdown)	56	4.0	1	9	224		
1.1b	CT Blowdown (Tanker filling)					78		
1.1	Total CT blowdown					302		
1.2	ETP inlet (N-Pit)			1	0.5	13		
	Inflow of ETP				9.8	237		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet	51	4.3	1	9.1	220		
	Outflow of ETP				9.1	220		
	Difference				0.7	17.00		Storage in equalisation tank.
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				9.1	220		
	Inflow of UGR				**9.1**	**220**		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Horticulture Pump (Potable	25	5.0	1	5.2	125		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Water)							
2.2	Ash Water Pump	26	1.5	1	1.6	39		
2.3	Service Water	95	0.3	1	1.2	29		
	Outflow of UGR				8	193		
	Difference				1.14	27		Storage in UGR tank

Summary of Recommendations:

Water Balance Study by NPC at BEL, Utraula plant has identified saving potential of **0.13MU/year** of Energy and **INR 4.27 Lakhs/year** of monetary savings. It is suggested that Utraula plant may prioritise below mentioned Water & Energy conservation measures and commence implementation at the earliest. It is the responsibility of the plant personnel to confirm with safety and other statutory requirements before implementing the proposed water and energy conservation measures.

Summary of Water and Energy Conservation measures identified at Utraula plant is shown below:

Table 5: Water and Energy Conservation measures identified at Utraula plant

Sr. No	Particulars	Annual savings potential		Investment (INR in Lakhs)	Simple payback period (Yrs.)
		Energy	Monitory		
		MU/yr.	INR in Lakhs		
1	Pump Efficiency Improvement by operating pumps near design flow and head for CW pump 2 and ACW Booster Pump 2 (Unit#1)	0.066	2.16	0.75	0.35
2	Pump Efficiency Improvement by operating pumps near design flow and head of Effluent Transfer pump (ETP).	0.001	0.03	Negligible	-
3	Install Energy Efficient Bore well pump set with VFD Drive	0.064	2.09	14.00	6.7
	TOTAL	**0.13**	**4.27**	**14.75**	**3.45**

General Observations and Recommendations:

- Install RO plant to treat the Cooling Tower Blowdown and recirculate the same to CT Make up.
- Stop ACW pump operation at partial load to manage excess water flow.
- Pump Efficiency Improvement by operating ACW Pump 2 near design flow and head.
- Dust suppression (DS) pumps are in operation during summer season only.
- Avoid overflows of water storage tanks by installing float-controlled valve at drinking water overhead storage tanks.
- Manage pressure in the system to ensure that optimal levels are maintained in the tanks. High pressure causes wear and tear on the system causing new leaks and increasing loss rates.
- Repair installed meters at different areas or zones to monitor flow rates. Manage metered data by setting flow rate thresholds. When exceeded, it indicates possible system leaks.
- To carry out regular inspection of nozzles for clogging and leak and repair the detected leaks;
- Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow.
- Turning off all water flows during shutdowns unless they are essential for cleaning. To use solenoid valves to stop water flow when production stops (valves can be activated by connecting them to drive motor controls).
- Adjust pump cooling and water flushing to the minimum required level. Sharing of information with employees on water usage procedure and amount of water used for each application is recommended. This would promote how employee actions can reduce water usage.
- Place signs and placards near new equipment, making it easy to understand new technology and how to use it properly.

1. Introduction

1.1 Background

Water is one of the key input requirements for thermal power generation. Water is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.

Water is used in almost all areas/ facilities of thermal power stations in one way or other. A typical list of plant systems/ applications requiring consumptive water is indicated as below:

i) Cooling water system for condenser & plant auxiliaries
ii) Power cycle make up
iii) Equipment cooling system
iv) Air conditioning and ventilation system
v) Coal dust suppression system
vi) Service water system
vii) Potable water system
viii) Gardening
ix) Evaporation from raw water reservoir

Difficulties are already being faced in existing thermal power plants due to non-availability of water. This problem is expected to be aggravated in future when more sites would be required. Thus there is a need to minimize consumptive water requirement for thermal power plants. Optimization/ minimization of plant consumptive water includes measures such as judicious utilization of water in different applications, adoption of reduced margins in various consumptive uses, adequate treatment for deteriorating quality of raw water, use of plant waste waters in various low grade applications and recycling of plant waste waters to maximum extent.

Water audit is an important management tool for effective conservation of water. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one is consumption audit on demand side. Water audit in the plant is conducted to identify supplied water quantity, water usage, losses, water quality, identify and priorities areas which need immediate attention for control, raise awareness on monitoring water consumption and to provide suggestions for effective water conservation.

The broad area of scope of work includes performance assessment of raw water sources & existing storage systems, estimation of present water consumption, water balance across the entire system, assessment of water consumption per unit generation, water quality management plan, measures of improving efficiency of water utility networks and also to enhance operational efficiency through controls.

1.2 About the Project

BEL, as part of their energy efficiency and resource conservation endeavours, had initiated the process of Auditing of significant systems/subsystems on a regular basis, with a view of achieving resource consumption optimization and continuous improvement. As a part of it, the management of BEL approached National Productivity Council (NPC), Delhi, to conduct the "Water Audit Study of five of its plants located in the state of Uttar Pradesh. Onsite measurements for the above stated Water Audit Study was carried out during the month of July 2020.

This report provides details about the scope, methodology, measurements, water balance of individual subsystems and overall plant, findings and recommendations of the water balance study of Utraula plant.

1.3 Objectives and Scope of the Study

The broad objectives of the study are:

- To assess water flow at each pump house/location
- To assess pump performance
- To arrive at water/energy conservation options

The scope of the water audit study includes:

- To assess consumption and draw a balance of the station comprising of 2 units (2X45 MW). They will be largely based on estimation method, plant design data, operating parameters etc. for various namely:
  - Raw water
  - DM water
  - Circulating water
  - Waste water

- To develop norms for in-house water consumption and use in terms of m^3/MWh for monitoring and targeting.
- To develop scope of water conservation among the above, along with cost benefits.
- To bring out allied energy & water conservation opportunities through water conservation study, along with cost benefits.
- To study total water consumption/Expenditure of previous years/months based on historical data.
- To suggest ways of systematic monitoring and assessment of water consumption including additional provision of flow measuring devices at appropriate locations (where ever necessary).
- To study Rainwater Harvesting Potential for the site.
- Checking the compliances of relevant conditions/requirements as stipulated by government authority such as CGWA, MoEF etc.
- NPC would be provided with:
  - ✓ On field water sampling reports (at Various locations for intake water, drinking water, process water, cooling tower blow down, wastewater) etc.
  - ✓ Laboratory testing & analysis reports for key parameters.

1.4 Methodology

The following methodology has been adopted while carrying out the Water Balance study at BEL, Utraula plant.

- ➢ Direct measurement-Using Ultrasonic Flow meter for clear water
- ➢ Inferential method based on Pump motor power input method

- The flow measurement in pipes was made using an ultrasonic flow meter (Adept, AFM 6720), wherever measurement conditions were available. This device is used to measure flow in pipes, at laminar flow conditions, and where 5 D upstream and 3 D downstream straight pipe lengths are available. Where such measurements are not possible like in CW pumps, flow measurement is done by using inferential pump testing method.
  - Electrical measurements were carried out by using 3 phase Power Analyser.

- Standard pressure gauges were used for monitoring suction & discharge pressures of pumps.

1.5 Instruments Used

- Ultrasonic Water Flow Meter
- 3-phase power analyser

1.6 About Bajaj Energy Limited

Bajaj Energy limited (BEL) is one of the largest private sector thermal generation companies in Uttar Pradesh and is involved in developing, financing and operating thermal power plants in India. BEL has a total installed capacity of comprising 450 MW from five operational plants of 90 MW each owned and managed by Bajaj Energy Limited (BEL), spread across the state of Uttar Pradesh.

BEL has entered into long-term fuel supply agreements with Central Coal Fields Limited & Northern Coal Field, subsidiaries of Coal India Limited & Northern Coal Field, for the supply of coal to the BEL Power Plants. The BEL Power Plants have been fully operational since 2012 and possess an operational track record of more than eight years.

1.7 About National Productivity Council (NPC)

National Productivity Council, an autonomous body under the Ministry of Industry, Government of India, was established in the year 1958, to promote productivity culture in the country. It is a tri-partite, non-profit making organization, with equal representation from the government, employers and workers organizations, apart from technical and professional institutions and other interests on its governing council. NPC, as an apex body, provides consultancy and training in various fields including Energy Management, over the past five decades and undertakes research in the areas of productivity. NPC has 12 regional offices in India and a total strength of about 135 professionals/consultants. NPC with its regional offices located in major cities / industrial cities has unique advantages in carrying out multi location assignments and assignments on all India basis.

Energy Management group of NPC has a total strength of around 30 fulltime EM professional out of which around 18 are certified Energy Auditors and about 10 are accredited energy auditors from Bureau of Energy Efficiency. NPC provides consultancy as well as capacity building services to several international,

national as well as unit level clients. EM Group offers consulting services in various sectors including industry, power generation, distribution, commercial, agriculture and SME clusters.

1.8 About the Plant

The total installed capacity of BEL, Utraula plant is 90 MW (2x45MW).

The major performance parameters of the Plant for a representative day during 5th July 2020 are:

Table 6: Performance Parameters

Parameters	Units	Unit 1 (45MW)	Unit 2 (45MW)	Station
At partial loading (68%)				
Avg. Generation	MW	30.74	30.69	61.43
Avg. daily Steam (Boiler)	TPH	124	124	248.58
DM Make-up	TPD	12.51	12.49	25.00
DM Make-up	TPH	0.521	0.520	1.04
% of DM Make-up	%	0.42%	0.42%	0.42%

2. Existing System

2.1 Installed Capacity

BEL, Utraula plant has an installed capacity of 90 MW as per the details given below:

2 x 45 MW	=	90 MW
Total	=	**90 MW**

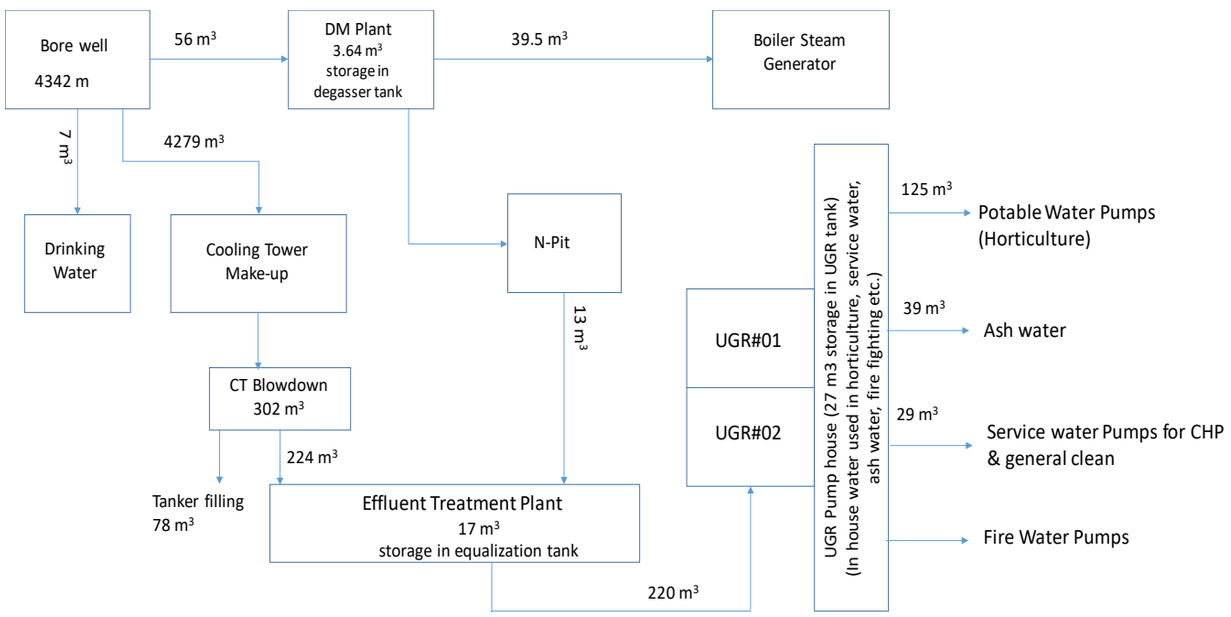
The following section describes the specifications of equipments related to various water systems in the plant.

2.2 Overall Water Balance Summary of the plant

Table 7: Water Balance Summary

Sl. No.	Item Ref.	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
1	**Total inflow**			
1.1	Total inflow	180.92	4342.16	
2	**Total outflow**			
2.1	DM plant inlet	2.33	56	
2.2	Drinking water	0.29	7.00	
2.3	CT make-up {1.1 - (2.1+2.2)}	178.30	4279	
	Total outflow	180.92	4342.16	

2.3 Overall Water Balance Diagram of the plant on Particular day



2.4 Bore well water and DM Plant

Utraula plant draws raw water from surface water by two bore well pumps, then it is pumped to DM plant for DM water generation, potable water for drinking water and cooling water make-up.

Table 8: Water Consumption and Balancing

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Total inflow of Raw water Make-up							
1	Bore well Pump - 1 (at near HR office)	138	14.32	1	82.3	1976		
2	Bore well Pump - 2 (at near CT)	169	14.00	1	98.6	2366		
1	Total Inflow of Raw water (1+2).				180.9	4342		
1	**Inflow of DM plant**							
1.1	DM Plant Inlet	16	3.5	1	2	56		
	Inflow of DM plant				2	56		
2	**Outflow of DM plant**							
2.1	DM Plant Outlet to DM plant storage tank	11	3.5	1	2.3	39		
2.2	N-pit Pump (to ETP inlet)	28	0.5	1	0.5	13		
2.1.1	DM Transfer Pump – 1	22	1.0	1	0.91	22		VFD Operated Pump
	Outflow of DM plant (2.1+2.2)				2.1	52		
	Difference				0.15	3.64		Storage in degasser tank

Table 9: Assessment of Water Pumps Performance

		Bore well Pump - 1 (18.5 kW)	Bore well Pump - 2 (18.5 kW)	N-Pit Pump
Particulars	**Unit**	**Pump**	**Pump**	**Pump**
Design Details				
Motor				
Rated Power	kW	18.5	18.5	7.5
Rated Voltage	V	415	415	415
Full Load Amps	A	38	38	14.3
Efficiency (η)	%	85	85	86
Speed	RPM	2850	2850	2850
Pump				
Head	m	25	25	30.28
Water flow rate	m^3/hr	180	180	45
Efficiency (η)	%	NA	NA	NA
Speed	rpm	2895	2895	2764
Measured Parameters				
Suction pressure	kg/cm^2	0.0	0.0	-0.15
Discharge pressure	kg/cm^2	1.1	1.1	1.2
Water flow rate	m^3/hr	138	169	28
Power input	kW	14	16	3
Motor Efficiency (estimated)	%	80	80	78
Calculation				
Suction head	m	0	0	-1.5
Discharge head	m	10.5	10.9	12
Total head	m	10.5	10.9	13.5
Water flow rate	m^3/s	0.038	0.047	0.008
Density of water	kg/m^3	1000	1000	1000
Hydraulic power	kW	3.95	5.02	1.03
Shaft power	kW	11.05	12.96	2.02
System efficiency	%	28.58	30.99	39.68
Pump efficiency	%	**36%**	**39%**	**51%**
% loading of flow	%	77%	94%	62%
% loading of head	%	42%	44%	45%
% Motor loading	%	63%	74%	30%
SEC (kWh/m3)		0.10	0.10	0.09

Analysis and observation

1. **Bore well pump- 1 & 2:** Pump efficiencies are found to be much lower (36% and 39% respectively) than the design value.
2. **"N" pit Pump:** Pump efficiency is found to be satisfactory level (51%) compared to the design value.

2.5 Effluent Treatment Plant (ETP) and Underground reservoir (UGR) tank:

Cooling tower blowdown and "N" pit water are sent to ETP for treatment and after treatment the clean water is pumped into the UGR tank. UGR water is used for:

1. Horticulture water;
2. Ash water;
3. Service water and
4. Fire water

Table 10: Water Consumption and Balancing

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1a	ETP inlet (CT blowdown)	56	4.0	1	9.3	224		
1.1b	CT Blowdown (Tanker filling)					78		
1.1	Total CT blowdown					302		
1.2	ETP inlet (N-Pit)			1	0.5	13		
	Inflow of ETP				9.8	237		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet	51	4.3	1	9.1	220		
	Outflow of ETP				9.1	220		
	Difference				0.7	17.00		Storage in equalisation tank.
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				9.1	220		

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
	Inflow of UGR				**9.1**	**220**		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Horticulture Pump (Potable Water)	25	5.0	1	5.2	125		
2.2	Ash Water Pump	26	1.5	1	1.6	39		
2.3	Service Water	95	0.3	1	1.2	29		
	Outflow of UGR				8	193		
	Difference				1.12	27		Storage in UGR tank

Table 11: Assessment of Water Pumps Performance

Particulars	Unit	Effluent Transfer Pump (Tube settler) Pump	Service Water Pump Pump	Ash Water Pump Pump	Potable Water Pump Pump
Design Details					
Motor					
Rated Power	kW	5.5	75	7.5	5.5
Rated Voltage	V	415	415	415	415
Full Load Amps	A	11.3	128	14.3	10.4
Efficiency (η)	%	85	93.6	86	85.7
Speed	RPM	1440	1480	2850	2850
Pump					
Head	m	14	70	30.28	30
Water flow rate	m^3/hr	45	250	48	25
Efficiency (η)	%	59	NA	NA	NA
Speed	rpm	1450	1416	2764	2764
Measured Parameters					
Suction pressure	kg/cm^2	-0.30	-0.3	-0.3	-0.3
Discharge pressure	kg/cm^2	0.6	7.9	3.8	3.1
Water flow rate	m^3/hr	51	95	26	25
Power input	kW	5	65	5	4
Motor Efficiency (estimated)	%	78	87	80	76
Calculation					
Suction head	m	-3	-3	-3	-3

		Effluent Transfer Pump (Tube settler)	Service Water Pump	Ash Water Pump	Potable Water Pump
Discharge head	m	6	79	38	31
Total head	m	9	82	41	34
Water flow rate	m^3/s	0.014	0.026	0.007	0.007
Density of water	kg/m^3	1000	1000	1000	1000
Hydraulic power	kW	1.25	21.23	2.90	2.32
Shaft power	kW	3.72	56.89	3.89	3.12
System efficiency	%	26.21	32.46	59.80	56.45
Pump efficiency	**%**	**34%**	**37%**	**75%**	**74%**
% loading of flow	%	113%	38%	54%	100%
% loading of head	%	64%	117%	135%	113%
% Motor loading	%	74%	82%	56%	64%
SEC (kWh/m3)		0.09	0.69	0.19	0.16

Analysis and observation

1. **Effluent Transfer Pump (Tube settler):** Pump efficiency was found to be much lower (34%) compared to design value (59%).
2. **Service Water Pump:** Pump efficiency was found to be much lower (37%) compared to design value. The operational factors influencing efficiency variation are felt to have higher loading on flow and lower loading on head.
3. **Ash Water Pump:** Pump efficiency was found to be satisfactory level.
4. **Potable Water Pump:** Pump efficiency was found to be satisfactory level.

2.6 Circulating Water (CW) Pumps, Auxiliary Cooling Water (ACW) Pumps and Auxiliary Cooling Water (ACW) Booster Pumps:

CW pumps and ACW pumps supply water from cooling tower cold basin to the condenser, from where the return water is sent to cooling tower. There are three CW pumps, of which one pump is in operation during study period (at 55% loading). Each CW Pump capacity is of $8600m^3/hr$ and there are two ACW pumps, of which one pump is in operation during study period (at 55% loading)

There are two CW booster pumps provided for each unit to meet the auxiliary equipment cooling water requirements, of which generally one pump is in operation during study period (at 55% loading). These pumps take suction from condenser cooling water inlet header and after heat exchange duty the water is returned to condenser cooling water outlet header.

Operational schedule of the CW pumps, ACW pumps and CW booster pumps at different unit loading condition:

- At partial load (55%) = 1 CWP + 1 ACWPs + 1 ACW Booster pump are in operation.
- At full load (100%) = 2 CWPs + 2 ACW Booster pumps are in operation.

Water distribution circuit diagram is given below:

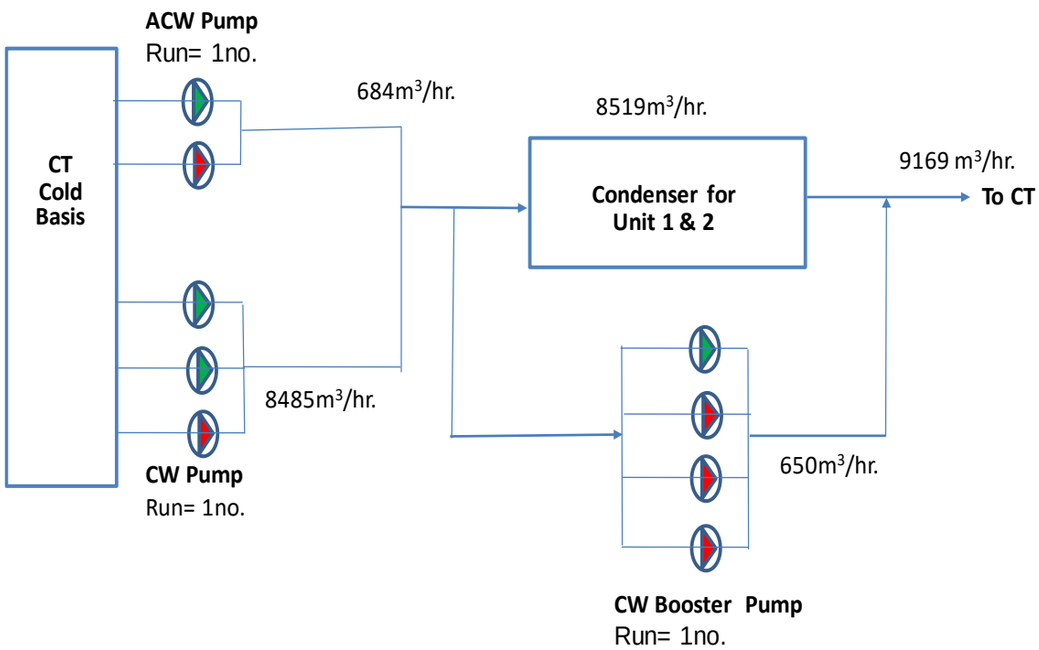


Table 12: Water Consumption and Balancing (CW System)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m³/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m³/hr) (@24hrs / day).	Avg. Flow (m³/day)	Remarks
1	**Cooling Water (CW) System**					
1.1	CW Pump-1	7850	24	7850	188400	Two CW pumps (CWP 1 & 3) run
1.2	CW Pump-2	8560	24	8560	205440	One CW pump run
1.3	ACW Pump-2	684	24	684	16416	
1.4	Unit#1 Booster Pump – 2	560	24	560	13440	
1.5	Unit#2 Booster Pump -1	740	24	740	17760	
1a	Total Cooling water flow at partial load.			9169	220056	* 1 CWP + 1 ACWP + 1 ACW Booster pump are run at partial load.
1b	Total Cooling water flow at full load.			16970	407280	* 2 CWPs + 2 Booster pumps are run at full load.

Table 13: Water Consumption and Balancing (for Condenser)

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	Remarks
	CW Flow to Condenser (by calculation)					
1	CW flow to Condenser at partial load.	8239	24	8239	197736	* 1 CWP - 1 ACWP are run at partial load.
2	CW flow to Condenser at full load (100%).	15670	24	15670	362080	* 2 CWPs - 2 ACWPs are run at full load.

Table 14: Assessment of Water Pumps Performance (ACW Pumps)

		ACW Pump 2	CW Pump 1	CW Pump 2	Unit#1 Booster Pump 2	Unit#2 Booster Pump 1
Particulars	**Unit**	**Pump**	**Pump**	**Pump**	**Pump**	**Pump**
Design Details						
Motor						
Rated Power	kW	75	700	700	55	55
Rated Voltage	V	415	11000	11000	415	415
Full Load Amps	A	126	46.7	46.7	96	96
Efficiency (η)	%	92	92	92	92	426
Speed	RPM	1480	745	745	1470	1470
Pump						
Head	m	35.4	23.16	23.16	25	25
Water flow rate	m^3/hr	500	8600	8600	500	500
Efficiency (η)	%	-	85	85	NA	NA
Speed	rpm	1480	745	745	1416	1416
Measured Parameters						
Suction pressure	kg/cm^2	0.00	0.00	0.00	1.2	1.2
Discharge pressure	kg/cm^2	1.8	2.25	1.60	2.9	2.9
Water flow rate	m^3/hr	684	7850	8560	560	740
Power input	kW	70	618	622	52	54
Motor Efficiency (estimated)	%	87	90	90	85	85
Calculation						
Suction head	m	0	0	0	12	12
Discharge head	m	18.4	22.5	16	29.1	28.5
Total head	m	18.4	22.5	16	17.1	16.5
Water flow rate	m^3/s	0.190	2.181	2.378	0.156	0.206
Density of water	kg/m^3	1000	1000	1000	1000	1000

		ACW Pump 2	CW Pump 1	CW Pump 2	Unit#1 Booster Pump 2	Unit#2 Booster Pump 1
Hydraulic power	kW	34.30	481.30	373.22	26.09	33.27
Shaft power	kW	60.95	556.54	560.00	44.35	45.65
System efficiency	%	48.95	77.83	59.98	50.01	61.96
Pump efficiency	**%**	**56%**	**86%**	**67%**	**59%**	73%
% loading of flow	%	137%	91%	100%	112%	148%
% loading of head	%	52%	97%	69%	68%	66%
% Motor loading	%	86%	81%	82%	87%	416%
SEC (kWh/m3)		0.10	0.08	0.07	0.09	0.07

Analysis and observation

1. **Circulating Water (CW) Pump (No: 1):** Pump efficiency of 86% is found to be at satisfactory level.
2. **Circulating Water (CW) Pump (No: 2):** Pumps efficiency of 67% is found to be much below compared to design value of 85%. The operational factors influencing efficiency variation is felt to have on lower loading on head.
3. **Auxiliary Cooling Water (ACW) Pump 2:** Pump efficiency of 56% is found to be much below compared to design value. The operational factors influencing efficiency variation is felt to have higher loading on flow and lower loading on head.
4. **ACW Booster Pump 2 (Unit-1)** Pump efficiency of 59% is found to be very much below compared to design value. The operational factors influencing efficiency variation is felt to have higher loading on flow and lower loading on head.
5. **ACW Booster Pump 1 (Unit-2):** Pump efficiency of 73% is found to be at satisfactory level.

2.7 Cooling Tower System

Performance Evaluation of Cooling Tower at partial loading (54%) is given below:

Date: 5th July 2020
At Partial Loading (54%)

Table 15: Performance Evaluation of Cooling Tower

Sl. No.	Item Ref.	Unit	Values			Remarks
			Unit -1	Unit - 2	Total	
	Cooling Tower (CT) System					
1	Unit Load	MW	24	24	49	
	% of NCR	%	54%	54%	54%	
2	CW flow	m^3/hr	8889		8889	
3	CW inlet water temperature	^oC	35	33	34	
4	CW outlet water temperature	^oC	45	43	44	
5	Temperature difference	^oC	10	10	10	10^oC as design.
6	DBT at ambient	^oC			28	
7	WBT at ambient	^oC			27	
8	C.O.C				6	
9	Evaporation loss	m^3/hr			136	
		%			1.53%	As per design 1.67%.
10	Blow down as per calculation	m^3/hr			25	
11	Total CT make-up as per calculation	m^3/hr			161	
12	Range	^oC			10	
13	Approach	^oC			7.35	4^oC as per design
14	Effectiveness				0.58	

2.8 Condenser System

Performance Evaluation of Condenser System at partial loading (54%) is given below:

At Partial Loading (54%) = 54% x (2x45MW) = 49MW

Date: 5th July 2020
At Partial Loading (54%)

Table 16: Performance Evaluation of Condenser System

Sl. No.	Item Ref.	Unit	Values		Total	Remarks
			Unit -1	Unit - 2		
	Condenser System					
1	Unit Load	MW	24	24	49	At NCR 45MW as per design.
	% of NCR	%	54%	54%	54%	
2	CW flow of condenser (by calculated)	m^3/hr	8239		8239	
3	CW inlet water temperature	^oC	35	33.05	34	32^oC as design.
4	CW outlet water temperature	^oC	45	42.84	44	42^oC as design.
5	Temperature difference	^oC	10	10	10	10^oC as design.
6	Condenser Thermal Load as run condition	million kCal/hr			82	.

3. Environmental Compliances Related to Water

Being a reputed thermal power generating company of Uttar Pradesh state, Utraula Unit of Bajaj Energy Limited (BEL) always makes it a point to fulfil the environmental compliances as per the guidelines given by **Central Ground Water Authority (CGWA)** and **Uttar Pradesh Pollution Control Board (UPPCB)**.

Table 17: Compliances related to Water

Sl. No.	Condition	Status/ Compliance	Remarks
1	The plant may extract 6,984 m3/day (≤20,95,850 m3/year) with two existing bore wells.	The plant is maintaining the water withdrawal limit	Checked during visit
2	Digital Meters must be installed at each bore well and log book must be maintained	Digital meters are installed for both bore well and log book is maintained	
3	Ground water level monitoring through existing piezometers.	Plant is continue monitoring the ground water level	Ground water level data for last one year- Annexure-I
4	Recycling and reuse of waste water	Complied	-

Water Saving Potential at Bajaj energy units of having capacity (2 x 45 MW each)		
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m^3/MWH.		
While as per CGWA NOC BEL plants are entitled for daily ground water withdrawal of 6984 m^3/day which is equivalent to 3.23 m^3/MWH at station full load running condition. This withdrawal limit is already less than MOEF norms		
Recently CGWA has issued guideline dated 24 sept 2020 which states as following "All industries abstracting ground water in excess of 100 m^3/day shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means. "		
Therefore we have worked out the maximum water saving potential in all BEL stations and also worked out best specific water consumption which can be achieved by BEL stations		
Specific water consumption As per MOEF (m^3/MWH)	3.50	
Approved water quantity per day by CGWA(m^3/day)	6984	
Specific water consumption As per CGWA Approved water quantity (m^3/MWH)	3.23	
A. Water consumption Break up at full load at	Quantity	Remarks

COC-7	(m3)	
Evaporation Loss (m^3/Day)	5914	
Drift Loss (m^3/Day)	6	
COC	7	
Blow Down loss(m^3/Day)	986	
Cooling Tower Make up(m^3/Day)	6906	
Potable Water Quantity (m^3/day)	10	
Evaporation loss from water reservoir (m^3/day)	3	
DM Plant Make up(m3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	6984	
Horticulture (m^3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (m3/Day) Used from ETP Treated Water	150	Not considered in total ground water consumption

B) Saving Potential at Full Load Condition

Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7

Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 591 M3 Water may be utilised as CT Make up

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	591	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(m3/Day)	6314	
DM Plant Make up(M3/Day) Includes RO-DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (m3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (m3/Day)	50	
Total Bore well water required(m3/day)	6443	
Water saving from approved Quantity (m^3/day)	541	
% Water Saving from approved Quantity)	7.8%	

Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9

Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.

Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	5914	

Drift Loss (M3/Day)	6	
COC	9	
Blow Down loss(M3/Day)	739	
Water Being used as CT make up from UF RO System(70% recovery)	517	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	6142	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	6270	
Water saving from approved Quantity (M3/Day)	714	
% Water Saving from approved Quantity	10.2%	
Maximum Possible water saving is 10.20%		

We have also worked water saving potential at 80% Loading factor.		
Specific water consumption As per MOEF (M3/MWH)	3.50	
Proportionate water quantity at 80% Loading Factor per day(m3/day)	5587	80% quantity
Specific water consumption As per CGWA Approved water quantity (M3/MWH)	3.23	
C. Water consumption Break up at 80% load at COC-7	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	7	
Blow Down loss(M3/Day)	789	
Cooling Tower Make up(M3/Day)	5525	
Potable Water Quantity (m3/day)	10	
Evaporation loss from water reservoir (m3/day)	3	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Total Bore well water required(M3/Day)	5603	
Horticulture (M3/Day) Used from ETP Treated Water	50	Not considered in total ground water consumption
CHP Dust Suppression & Ash Quenching and Floor Washing (M3/Day) Used from ETP Treated Water	150	Not considered in total ground

		water consumption
D) Saving Potential at 80% Load Condition		
Case 1 -Cooling tower Blow Down water Recycling with UF-RO System installation with COC 7		
Since Blow down water Quality is harsh, so only 60% recovery is ,In this case 414 M3 Water may be utilised as CT Make up		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Water Being used as CT make up from UF RO System (60% recovery of CT Blow Down	473	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash quenching
Cooling Tower Make up(M3/Day)	5052	
DM Plant Make up(M3/Day) Includes RO- DM water production, RO Reject & MGF Back wash & DM Plant Regeneration	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5180	
Water saving from approved Quantity (M3/Day)	407	
% Water Saving from approved Quantity)	7.3%	
Case 2- 85% Cooling Tower Blow down & 15% Fresh water Make up recycling with UF-RO System Installation at COC-9		
Blended water quality will be quite superior than Blow down water. So 70% recovery may be possible.		
Water consumption and Saving will be as :	**Quantity (m3)**	**Remarks**
Evaporation Loss (M3/Day)	4731	
Drift Loss (M3/Day)	5	
COC	9	
Blow Down loss(M3/Day)	591	
Water Being used as CT make up from UF RO System(70% recovery)	414	Reject of UF RO will be used for CHP dust suppression, Floor washing & Ash

		quenching
Cooling Tower Make up(M3/Day)	4914	
DM Plant Make up(M3/Day)	65	
Potable (M3/Day)	10	
Evaporation loss from water reservoir (m3/day)	3	
Horticulture (M3/Day)	50	
Total Bore well water required(M3/Day)	5042	
Water saving from approved Quantity (M3/Day)	545	
% Water Saving from approved Quantity	9.8%	
% Water Saving from approved Quantity : 9.8%		

Conclusion: It is seen from the above working that 20% reduction target is difficult to achieve in thermal power plants.

Apart from the above, plant will take up annual water audit exercise, adopt measures to reduce fresh water consumption, monitor ground water and will submit relevant data to the concerned authority.

Table 18: Plant Production and Consumption Details

Sl. No.	Description	2019-20 (July, 2019-June, 2020)
1	Total Power Generation (MWh)	127458
2	Total Raw Water Consumption (m3)	413810
3	Specific Raw Water Consumption (m3/MWh)	3.25

Table 19: Treated Water Parameters

Sl. No.	Location	Parameter	Unit	Actual Value	CPCB Standard Value (Inland Surface Water)
1	ETP I/L	pH	-	6.96	-
2		Total Suspended Solid (TSS)	mg/l	94	-
3		Bio-chemical Oxygen Demand (BOD)	mg/l	54	-
4		Chemical Oxygen Demand (COD)	mg/l	260	-
6	ETP O/L	pH	-	7.26	5.0-9.0
7		Total Suspended Solid (TSS)	mg/l	28	100
8		Bio-chemical Oxygen Demand (BOD)	mg/l	14	30
9		Chemical Oxygen Demand (COD)	mg/l	56	250

***Sample collected on 18/06/2020 by third party. Test was conducted by third party.**

Table 20: Ground Water Parameters

Sl. No.	Parameter	Unit	Value	Desirable Limit*	Permissible Limit*
1	Colour	HZN	<5.0	5 max	15 max
2	Odour	-	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1.0	1 max	5 max
5	pH	-	7.46	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	202	200 max	600 max
7	Iron (Fe)	mg/L	0.29	0.3 max	No Relaxation
8	Chloride (Cl)	mg/L	112	250 max	1000 max
9	Residual Free Chlorine	mg/L	<0.2	0.2 min	1
10	Sulphates (SO_4)	mg/L	36	200 max	400 max
11	Total Alkalinity	mg/L	190	200 max	600 max
12	Fluoride (F)	mg/L	0.19	1.0 max	1.5 max
13	Total Dissolved Solid (TDS)	mg/L	416	500 max	2000 max
14	Total Coliform	MPN/100ml	Not Detected	-	-
15	E coli	/100ml	Not Detected	-	-

***as per IS 10500**

Sample collected on 18/06/2020 by third party. Test was conducted by third party

From the above tables, it is evident that the plant is complying with the relevant parameters mentioned by CGWA and UPPCB.

4. Water and Energy Conservation Options

4.1 RECOMMENDATION – 1: Pump Efficiency Improvement by operating CW pump 2 and ACW Booster Pump 2 (Unit#1) near design flow and head.

Present Scenario

As a part of the water audit study, operating performance of the CW pump 2 & 3 and ACW Booster Pump 2 (Unit#1) were assessed by measuring different parameters, like flow, pressure and corresponding power input to the drive motor. It was observed that the said pumps were operating with low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumps to be operate near design flow and head, to improve pump efficiency.

Table 21: Cost Benefit Analysis for Recommendation 1

Item Ref	Unit	Circulating Water (CW) Pump - 2	ACW Booster Pump 2 (Unit#1)	Total
Present Condition:				
No of pumps operation	No	1	1	
Motor input (Avg.)	KW	622.23	52.18	
Water flow (Avg.)	m3/hr	8560	560	
Total Head Dev (THD) (Avg.)	mWC	16	17.1	
Liquid kW / Pump shaft power (Avg.)	KW	373.216	26.095	
System Efficiency (Pump & motor) (Avg.)	%	59.98%	50.01%	
Proposed Condition:				
Pump Efficiency under proposed condition (Avg.)	%	70	70	
Motor efficiency (assume)	%	90	90	
Proposed system Efficiency (Pump & motor)	%	63	63	
Proposed motor input (pump set)	KW	592.41	41.42	
Power savings of each pump	KW	29.82	10.76	
Annual Hrs. operation	Hrs/Yr	1650	1600	
Envisaged reduction in annual energy consumption in the pump drives.	kWh	49204	17216	**66420**
	MU/Yr	**0.049**	**0.017**	**0.066**
Unit selling Price	INR/kWh	3.25	3.25	
Annual Energy Cost savings potential	INR in Lakhs	**1.60**	**0.56**	**2.159**
Investment	INR in Lakhs	0.5	0.25	**0.75**
Simple Pay Back Period	Yrs	0.31	0.45	**0.35**

4.2 RECOMMENDATION – 2: Pump Efficiency Improvement by overhauling and operating Effluent Transfer pump (ETP) near design flow and head.

Present Scenario

As a part of the water audit study, operating performance of the Effluent transfer pump were assessed by measuring different parameters, like flow, pressure and corresponding power input to the drive motor. It was observed that the said pumps were operating at low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumps to be operate near design flow and head, to improve pump efficiency.

Table 22: Cost Benefit Analysis for Recommendation 2

Item Ref	Unit	Effluent Transfer Pump
Present Condition:		
No of pumps operation	No	1
Motor input (Avg.)	KW	4.77
Water flow (Avg.)	m3/hr	51
Total Head Dev (THD) (Avg.)	mWC	9
Liquid kW / Pump shaft power (Avg.)	KW	1.25
System Efficiency (Pump & motor) (Avg.)	%	26.21%
Proposed Condition:		
Pump Efficiency under proposed condition (Avg.)	%	55
Motor efficiency (assume)	%	80
Proposed system Efficiency (Pump & motor)	%	44
Proposed motor input (pump set)	kW	2.84
Power savings of each pump	kW	1.93
Annual Hrs. operation	Hrs/Yr	431.0
Envisaged reduction in annual energy consumption in the pump drives.	kWh	831
	MU/Yr	0.0008
Unit selling Price	INR/kWh	3.25
Annual Energy Cost savings potential	INR in Lakhs	0.03
Investment	INR in Lakhs	Negligible

4.3 RECOMMENDATION – 3: Install Energy Efficient Bore well pumps set with VFD Drive

Present Scenario

As a part of the water audit study, operating performance of the Bore well pumps were assessed by measuring different parameters, like flow, pressure &

corresponding power input to the drive motor. It was observed that the said pumps were operating at low efficiency level (pump).

Proposed Measure

It is proposed that the above identified underperforming pumps & motors to be replaced by energy efficient pump sets with VFD drive, to reduce energy consumption.

Table 23: Cost Benefit Analysis for Recommendation 3

Item Ref	Unit	Bore well Pump - 1 (18.5 kW)	Bore well Pump - 2 (18.5 kW)	Total
Present Condition:				
No of pumps operation	No	1	1	
Motor input (Avg.)	KW	13.81	16.20	
Water flow (Avg.)	m3/hr	138	169	
Total Head Dev (THD) (Avg.)	mWC	10.5	10.9	
Liquid kW / Pump shaft power (Avg.)	KW	3.949	5.020	
System Efficiency (Pump & motor) (Avg.)	%	28.58%	30.99%	
Proposed Condition:				
Pump Efficiency under proposed condition (Avg.)	%	60	60	
Motor efficiency (assume)	%	85	85	
Proposed system Efficiency (Pump & motor)	%	51	51	
Proposed motor input (pump set)	KW	7.74	9.84	
Power savings of each pump	KW	6.07	6.36	
Annual Hrs. operation	Hrs/Yr	5227	5110	
Envisaged reduction in annual energy consumption in the pump drives.	kWh	31739	32486	64225
	MU/Yr	0.032	0.032	0.064
Unit selling Price	INR/kWh	3.25	3.25	
Annual Energy Cost savings potential	INR in Lakhs	1.03	1.06	2.087
Investment for Energy Efficient Pump set (Pump & motors and bore well) with VFD drive	INR in Lakhs	7	7	14
Simple Pay Back Period	Yrs	6.79	6.63	6.71

5. Rain Water Harvesting

5.1 Rain Water Harvesting Programme

Rain Water Harvesting, is an age-old system of collection of rainwater for future use. But systematic collection and recharging of ground water, is a recent development and is gaining importance as one of the most feasible and easy to implement remedy to restore the hydrological imbalance and prevent a crisis. Rain water harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later. Rooftop rainwater harvesting: Rooftop rainwater from the administrative office area, factory area and other plant area is flown down to the ground and then taken to storm water drains. The storm water drains are intercepted at strategic locations and rainwater is diverted into recharge wells.

The recharge wells will be provided with recharge bores to facilitate the recharge. Layers of filtering material like boulders, pebbles and coarse sand inside the recharge well ensure efficient filtration. In addition to this Rain water harvesting and groundwater recharge structures will also be constructed outside the plant premises to augment the ground water level.

In scientific terms, water harvesting refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage and all other hydrological studies and engineering inventions, aimed at conservation and efficient utilization of the limited water endowment of physiographic unit such as a watershed. Rain is a primary source of water for all of us. There are two main techniques of rainwater harvesting:

- Storage of rainwater on surface for future use
- Recharge to groundwater

Directly collected rainwater can be stored for direct use or can be recharged into the groundwater. All the secondary sources of water like rivers, lakes and groundwater are entirely dependent on rain as a primary source.

Rainwater harvesting structures shall be provided to recharge the groundwater resources in the region. The run-off water from the roof of the structures and paved areas shall be collected through storm water drainage system and led to rain water harvesting structure.

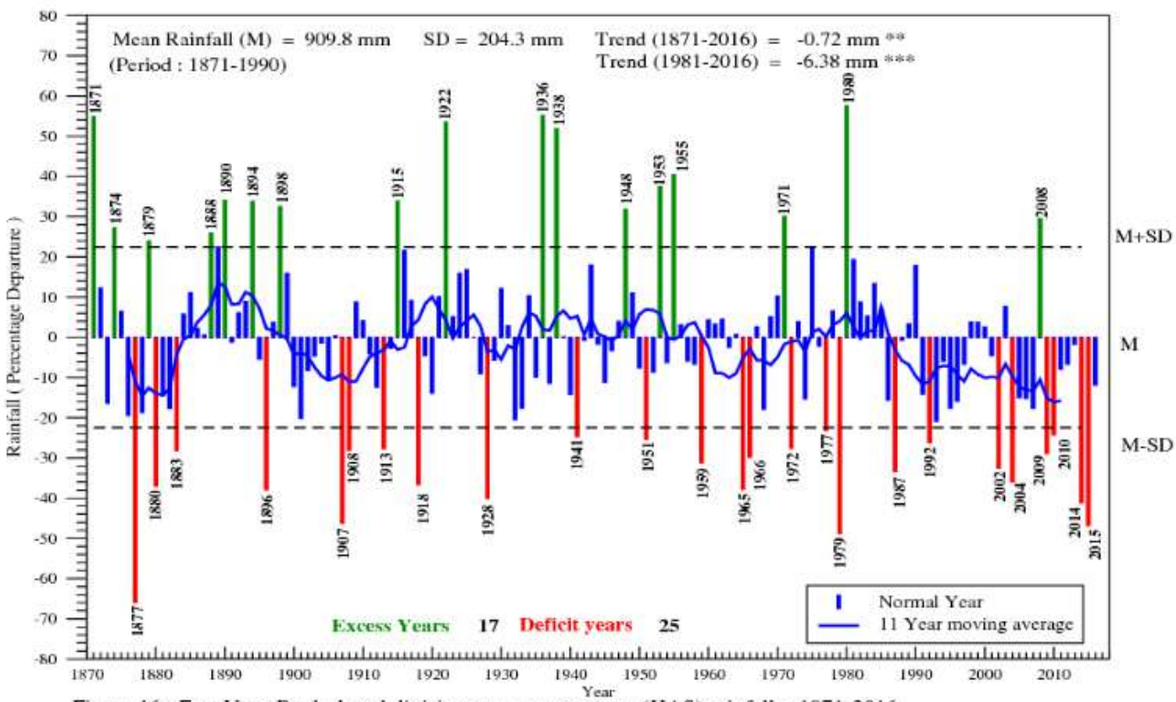


Figure 16 : East Uttar Pradesh subdivision summer monsoon (JJAS) rainfall : 1871-2016
(Trend - mm/year, *, ** and *** significance at 10 %, 5 % and 1 % level, rainfall data for the period 1871-2012 based on 306 stations and 2013-2016 based on IMD subdivisional rainfall)

Annual Rain Fall	***909.8 mm (East UP)***

5.2 Rainwater Harvesting Facilities

For augmenting the ground water resources in the plant premises, number of rainwater harvesting pits will be constructed and the internal drains where excess rain water flowing in drain will be diverted to these pits. These structures will facilitate percolation of water into the ground and thus augmenting the groundwater sources. The roof top water will be routed to the storm drains. This will result in increase in groundwater tables and to some extent the improvement of ground water quality.

Rainwater Harvesting in Utraula unit will be very useful. With respect to the physical alternatives to fulfil sustainable management of freshwater, there are two solutions - first reuse the rainwater at washroom, gardening and the second is for ground water recharge.

The size and the locations of rainwater harvesting pits will be decided during detailed engineering of the project.

Run off from the proposed project site is calculated using rational formula:

$$Q = C \, x \, I \, X \, A$$

Q = Run-off in m3/hr

A = Catchment Area (Sq.m)

C = Coefficient of Run-off

I = intensity of Rainfall in mm/yr

5.3 Rain Water Harvesting Potential Calculation

Table 24: Rainfall Data

Particulars	Unit	Values
Intensity of rainfall (in mm) based on IMD Data	mm/yr	909.8
No. of rainy days		48
Rainfall per day	mm/day	18.954
	m/day	0.0190

Table 25: Roof top area

Description	Unit	Values									
		TG Building	Deaerator Floor	Stores	Switchyard control room	DM Plant MCC & Lab	ESP Control room	CHP Control room	UGR MCC	Boiler roof	Unit Panel Room
Drainage area in m2	m2	2170	860	288	84	120	250	160	60	750	60
Coefficient of run-off	-	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Runoff	m3/day	34.961	13.855	4.640	1.353	1.933	4.028	2.578	0.967	12.083	0.967
Total runoff	m3/day	77.365									

Table 26: Storage Potential

Location	Unit	*Values
TG Building	m3/day	13.98
Deaerator Floor	m3/day	5.54
Stores	m3/day	1.86
Switchyard control room	m3/day	0.54
DM Plant MCC & Lab	m3/day	0.77
ESP Control room	m3/day	1.61
CHP Control room	m3/day	1.03
UGR MCC	m3/day	0.39
Boiler roof	m3/day	4.83
Unit Panel Room	m3/day	0.39
Total	**m3/day**	**30.95**

Considering collection efficiency to be 40%

5.4 Recommendation for use of rain water

- The collected rain water can be pumped to a combined filtration system for removal of suspended solids and other impurities. Sand filter and activated carbon filter can be installed for filtration of rainwater before reuse.
- The following overarching goals apply to the implementation of rain water harvesting and reuse systems:
  - ✓ Reduction of rain water pollutant loads and flows to surface waters, helping achieve local rain water management requirements;
  - ✓ Reduction of the demand on potable water sources; and
  - ✓ Reduction of stress on the existing water supply infrastructure.
- Additionally, rain water harvesting and reuse systems can be used to help achieve Leadership in Energy and Environmental Design (LEED) and other sustainable design credits related to rain water quantity and quality as well as water efficiency.
- Although rain water harvesting and reuse systems appear to be a viable alternative to help achieve required rain water management standards as well as reducing the demand on the potable water supply, they are not without concerns. Concerns include human exposure to pathogens, cross-contamination of the potable water supply and exposure due to ingestion of crops potentially contaminate harvested rainwater for bacteriological parameters and other organic load before reuse in processes.

6. Motor Load Survey

Motor Load survey are given below:

Table 27: Motor Load Survey

Bore well Pump - 1									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	18.5	415	38	85	417	24.75	0.77	13.81	63.47
Bore well Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	18.5	415	38	85	419	28.52	0.78	16.20	74.43
Effluent Transfer Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	5.5	415	11.3	85	422	10.00	0.65	4.77	73.74
DM Transfer Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	-	82	429	9.03	0.71	4.74	51.82
N-Pit Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	86	**424**	**5.43**	**0.65**	**2.60**	29.76
Unit#2 Booster Pump - 1									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	90	425	84.77	0.86	53.70	87.88
ACW Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	75.0	415	126	92	425	110.67	0.86	70.06	85.94
CW Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	45.7	92	11227	40.00	0.80	622.23	81.78

CW Pump - 1									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	700.0	11000	45.7	92	11130	39.77	0.81	618.38	81.27
Unit#1 Booster Pump - 2									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	55.0	415	96	92	426	82.23	0.86	52.18	87.28
Service Water Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	75.0	415	128	93.6	424	107.37	0.83	65.39	81.61
Ash Water Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	7.5	415	14.3	86	424	8.17	0.81	4.86	55.70
Potable Water Pump									
Phase Ref.	Rated Parameters				Measured Parameters				
	KW	V	A	Eff (%)	Voltage	Amps	PF	KW	% Loading
3Ø	5.5	415	10.4	85.7	422	7.10	0.79	4.10	63.93

7. Checklist for Self-Assessment for Determining Water Efficiency for Facility Managers

Sl. No.	Activities	Descriptions	Frequency
1	Monitoring of cycle of concentration	Cooling towers are normally designed for a COC of 5 with requirement of makeup water typically about 2.1% of water flow (comprising of 1.7% evaporation loss, 0.05% drift loss and 0.35% as blow down). By increasing the COC, the blow down quantity can be reduced by external water treatment and adding water treatment chemicals, COC of even 10 can be reached. Increasing COC can result in significant savings of water as the blow down will be further reduced by suitably improving the chemical regime of circulating water, if feasible.	Weekly
2	Monitoring of leaks and overflows	Leakages from valves, taps, fire fighting hoses, underground fire fighting lines, cooling tower basin, gardening hoses area also a source of water loss. There lies a possibility of reducing the water consumption by plugging the leakages. For every litre of water lost in a water network, another litre of water has to be treated and pumped through the distribution network to compensate.	Weekly
3	Installation of Pressure Gauges and Monitoring	In both the suction and discharge side of the circulating pumps. If the gauge indicates the pressure (or pressure drop) in the process, that information is valuable only if one can do something about it like cleaning a filter.	Daily
4	Calibration of Water flow meters	Annual Calibration of all the water flow meters and pressure gauges must be ensured. A calibrated instruments ensures that the measurements and readings taken are authentic and hence can be used for reference for other study very easily	Annual
5	Operational hours of the circulating pumps to be monitored	In the log book on a continuous basis. Inclusion of operational hours in the log book keeps a track record of the running hours of individual pumps and hence is helpful to optimize the pumping operations if required.	Daily
6	Water quality test report of the Cooling Tower basin	To be conducted in shift-wise. This is important to ensure that COC of the cooling tower is maintained at the desired level to reduce the cooling tower blow down.	Shift wise
7	Maintenance of log book of the cooling tower make up water flow and soft plant water flow	A log book of the cooling tower make up water flow and soft plant water flow In the cooling tower to be maintained. Soft water being costly water should be monitored along with the makeup water for cooling tower.	Daily

8	Monitoring the amount of discharge water	Determining whether discharge from any one operation can be substituted for fresh water supply to another operation. In many cases, where water quality is not much of significance but is only used for washing and cooling purposes, the use of discharge water is recommended over fresh water.	Daily
9	Reuse of wastewater after treatment	Handling waste materials in a dry mode wherever possible. Use of even waste water should be minimized as far as possible.	Daily
10	Monitoring of raw water consumption	Reduction in water consumption in processes by closely monitoring of timings of processes and water circulation.	Daily
11	Monitoring of Rainwater collected in reservoir/ pond	Collection of rain water from factory premises to reservoir / ponds for future use to reduce the raw water intake	Daily

Annexure-I

Ground Water Level monitoring data for BEL Utraula unit are given below:

Period	Average Ground Water Level (m)
Jan, 2020	1.99
Feb, 2020	2.19
Mar, 2020	2.60
Apr, 2020	3.74
May, 2020	4.17
June, 2020	3.83
July, 2020	1.28

BENCHMARKS

The following table presents the Water Consumption Norms of few countries and water consumption levels of some of major Thermal Power Plants in the country:

S No	Reference	Norm
1.	USA (***Source:*** *National Renewable Energy Laboratory Report on Consumptive Water Use for US power Production*)	1.8 Ltrs/kWh
2.	South Africa (***Source:*** *MIT Report on Water Footprint of Electric Power Generation*)	2.02 Ltrs/kWh
3.	National Norm for 500MW Indigenous Coal Based Plant with wet Cooling Tower (***Source:*** *CEA Report minimization of water requirement in coal based Thermal Power station*)	3.0 ltr/kWh
4	National Norm 660MW Coal Based Super Thermal Power plant with ash water recycling (***Source:*** *FICCI Bulletin on Energy Efficiency 2006*)	3.0 -4.0 m3/MW
5	National Norm 660MW Coal Based Super Thermal Power plant without ash water recycling. (***Source:*** *FICCI Bulletin on Energy Efficiency 2006*)	4.0 -4.5 m3/MW
6	**Water Consumption in Some of the Power plant in India** **(Source of data:** Declared by the plant**)**	
(a)	Vidhyachal Stage I (6 X 210MW) (Raw water consumption is 4000m3/hr with AWRS in operation).	3.17m3/MW
(b)	Vidhyachal Stage II (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(c)	Vidhyachal Stage III (2X 500MW) (Raw water consumption is 3500m3/hr with AWRS in operation).	3.5m3/MW
(d)	Rihand thermal Power Station-Stage I & II(2 X 500MW + 2 X 500 MW) with AWRS in operation	3.21

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WATER AUDIT REPORT

As per the guidelines of CGWA

MINISTRY OF JAL SHAKTI

At

Bajaj Energy Limited, Utraula, Balrampur

Prepared by

Confederation of Indian Industry
CII-Triveni Water Institute

January 2022

Water Audit Report
Bajaj Energy Limited, Utraula, Balrampur

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It is well worthy to mention that the efforts being taken, and the enthusiasm shown by all the personnel towards water conservation are really admirable.





Sanjay Gupta
Senior Counsellor & Head Advisory Services
Confederation of Indian Industry
CII-Triveni Water Institute

Abbreviations

MGF	Multi-Grade Filter
DMF	Dual Media Filter
UF	Ultrafiltration
RO	Reverse Osmosis
ERS	Effluent Recovery System
CGWA	Central Ground Water Authority
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
ETP	Effluent Treatment Plant
IMD	Indian Meteorological Department
LPCD	Liter Per Capita Per Day
RWH	Rainwater Harvesting
SAC	Strong Acid Cation (DM plant unit)
SBA	Strong Base Anion (DM plant unit)
STP	Sewage Treatment Plant
WTP	Water Treatment Plant

Executive Summary

Bajaj Energy Limited, Utraula, Uttar Pradesh division is a coal based thermal power plant. It is situated in Balrampur District of Uttar Pradesh. It is spread across an area of 40.56 acres including Plant, ETP, New Coal yard & Ash Dyke. There are 3 borewells installed inside the plant area. The wastewater generated in the plant is treated in the common effluent treatment plant. The treated effluent from this ETP is used for various activities like firefighting, ash handling, dust suppression and gardening. The specific water consumption for the plant is 2.89 m^3/MWh of power generated (October 2020 – September 2021).

Currently, the plant had a consent to withdraw 21,60,000 m3/annum of water from 3 nos. borewells located within the plant area vide Registration no. 202108000332, 202108000181, valid upto 05/09/2026 and application no. BLMP0821NIN0011 from 3 borewells available inside the plant. At present, approximately 2271 m3/day (average of October 2020 – September 2021) of water is used for the plant operations. The plant has installed two piezometers with digital water level recorder and at four locations manual piezometers is used for water level monitoring inside the campus in compliance of the conditions mentioned in the NOC issued to them by Ground Water Department, Ministry of Jal Shakti, Government of Uttar Pradesh.

The plant has installed electromagnetic flow meters on all the three borewells and also on the common header of the borewells. Electromagnetic Flowmeters have also been installed at other locations like Boiler Feed, RO Reject, ETP Outlet, domestic water consumption etc.

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 28.29% which puts Balrampur district in the category of safe zone.

Given the above scenario of prevailing resource challenge, accelerating over time the management of Bajaj Energy Limited is very keen to do water audit of their premises. To get benefit of water saving projects, management of Bajaj Energy Limited awarded the task of water audit of its premises at Village Utraula, Balrampur district, Uttar Pradesh to CII Triveni Water Institute.

The audit is focused on improving water usage efficiency and identifying water conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by CII team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis.

Summary of Water Audit findings are presented in the following table shown below:

I	**Total Fresh Water Intake (Average)**	**2271 m^3/day**		
II	**Savings Achievable**	**101 m^3/day**		
	Water Saving Potential (%)	**4.44 %**		
Recommended Projects				
Sno.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	1	0.01	0.1
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	1.82	100
Observations				
1	Overflow from the cooling tower sump happens during plant shutdown as bypass arrangement was not in place			

- Water balance across the plant has been successfully achieved. Total consumption- Bore well: 2271 m^3/day (average of October 2020 – September 2021)
- Strategies identified for reduction, reuse and recycle show:
  - Collection and Reuse of supernatant MGF backwash water after settling in a settling tank
  - Installation of RO plant for treatment of ETP treated effluent and reuse in cooling towers
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.
- Internal audits to be undertaken at BEL, Utraula (every year); third party audits also recommended.

1. Introduction and background

1.1 Introduction

Water is a core element of natural capital, underpinning many business activities. Water risks cut across most industry sectors. As per the World Economic Forum Global Risks report, water crisis is the third most impactful global risks to business (WEF 2017). The risk continues to rise given the increasing demands and rising pressures. Safeguarding water and ensuring its availability in sufficient quantity and quality is therefore subject of vital interest to business.

Bajaj Energy Limited deals in generating coal-based power for UPPCL. They have an installed capacity of 2x45 MW power plant.

The present study focuses on BEL, Utraula unit for water audit at the plant level that would help in identification of appropriate water management and conservative strategies to minimize the risks to operations.

The first step towards efficiently managing and conserving water resources is monitoring and mapping water consumption under various processes. This involves conducting a regular water audit that identifies and quantifies water uses and losses from a water system.

A comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions.

Good initiatives taken by the plant

- Monitoring system for flow by installation of electromagnetic flow meters at borewells and other strategic locations, mechanical flowmeters installed at other locations such as pump house, cooling tower blow down etc.
- No fresh water is used for horticulture.
- The ETP treated water is used in various applications like gardening, ash handling, dust suppression and firefighting.
- The ETP treated water is used for Firefighting in the entire plant.
- Rainwater harvesting pits have been constructed for recharge of ground water collected from paved road and sideways.
- SWAS panel water is being collected and used as cooling tower makeup.

2. Scope

The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Utraula.

Scope of work of the study includes the following:

- Study of water sources (size, capacity, quantity, quality)
- Existing water distribution system, associated losses , Wastewater discharge points across the process and Identification of water
- consumption of each existing meter/sub-meter
- Quantification of water distribution network in each section
- Mapping of raw water, process, recirculating water, cooling & domestic, recycling & effluents
- Segregation and collection of waste streams based on quality and quantity
- Study of various treatment & disposal schemes deployed in the plant
- Identification and Recommendations of projects based on reduce reuse & recycle on water Conservation
- On-site discussion with facility manager and personnel
- Monitoring and measurements using pressure and flow meters and various other devices as and when required
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Water system analysis and Quantification of baseline water map
- Developing Water consumption and wastewater generation pattern
- Evolving value added "cost of water" at various water use locations
- Identification of "branch flow unbalancing" at multi-cell cooling tower & associated losses in cooling tower efficiency & high drift losses
- Calculation of Rainwater Harvesting Potential for the site
- Estimating Specific water use and conservation potential
- Evolving recommendations/schemes for improvement in water and wastewater management system With Cost
- Recommendations for reduction in water consumption particularly in two conditions
    - Plant Stoppage Condition

- Plant Running Condition

- Checking the compliances of all conditions/requirements as stipulated by government authority such as CGWA,MOEF etc.

3. Methodology of the Study

A team of three engineers were involved in carrying out the study. The study methodology involved the following steps:

- Preliminary discussions with plant personnel and observations in all water consuming areas
- Data collection through discussions, past records, specifications
- Identification of water conservation options on short, medium & long terms
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion, and submission of report to the management

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of portable instruments for carrying out various measurements and analyses. CII has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support water audit investigations and analyses. The specialized instruments that were used during the water audit include Ultrasonic water flow meter.

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

4. Assessment of Present Water Usage

4.1 Plant Water Consumption Trends

The source of water to the plant is borewell. Borewell water is majorly used for cooling and production applications after suitable treatment in water treatment plant. Borewell water is also utilized for domestic purposes. The figure below indicates the water consumption trend from October 2020 to September 2021. The uneven water consumption trend could be noticed because of the plant gets instructions from UPPCL for shutdown based on load requirements.



Figure 4.1: Water Consumption Trend Oct-20 to Sep-21

Specific Water Consumption

The specific water consumption is 2.89 m^3/MWh based on the data (October 2020 – September 2021) provided by the BEL, Utraula team.

4.2 Water Sources

The source of water to the plant is borewells. The plant has 3 borewells within its premises. Raw water is majorly utilized for cooling tower makeup and producing DM water which is utilized for feed to the Boiler. The average daily water consumption through borewells is 2271 m^3/day (October 2020 - September 2021).

The total water consumption for past three calendar years is as follows:

Table 4.1 Water consumption trends for past 3 years

Year	Jan – Dec 2018	Jan – Dec 2019	Jan – Dec 2020
Water Consumption (m^3/year)	745392	394023	686658

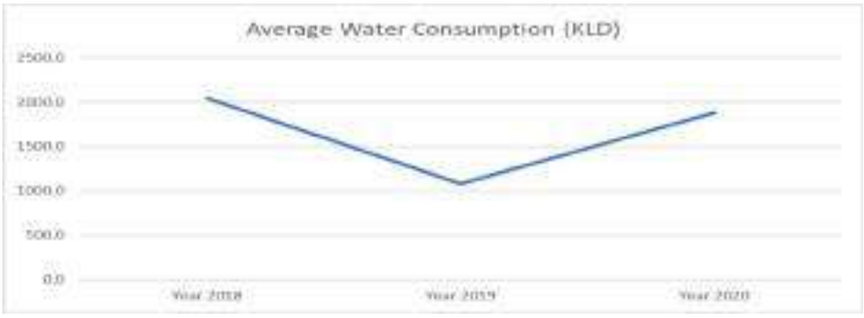


Figure 4.2: Water Consumption Trend for year 2018 - 2020

The running hours of borewell range from 7-18 hours depending upon requirement. Borewell no.3 was not being utilized during the data collection period.

The detailed description about the water source is provided below in the tabular form in table:

Table 4.2 Borewell Details

S.No.	Description	Depth (ft)	TDS (ppm)	Pumping capacity (m^3/h)
1	Borewell-1	121.95	325	180
2	Borewell-2	121.95	320	180
3	Borewell-3	121.95	305	180

Rainfall Pattern in last 5 years as per IMD

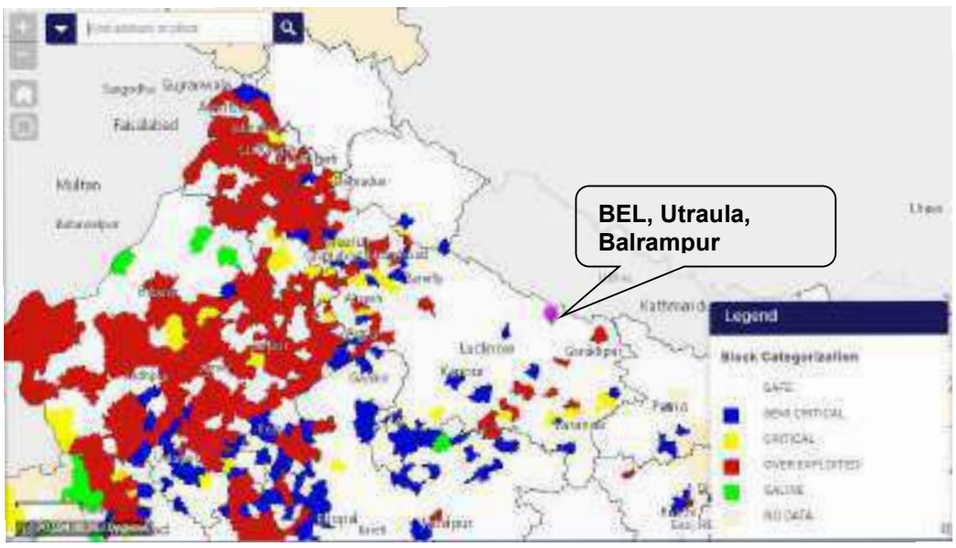
Total rainfall received at Balrampur district, based on IMD datasets shows that average rainfall is around 956.3 mm. The rainfall varies between 722.1 mm to 1347 mm in last 5 years (2016 to 2020).

Table 4.3 Average annual rainfall (mm) in last 5 years as per IMD data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	0	0	0	0	31.1	97.3	377.5	136.9	65.5	43	0	0	751.3
2017	7	0	6	0	13.5	50.2	243.3	260	52.8	15.9	0	0	648.7
2018	0	1	0	6	7.4	65.4	359	254.6	28.7	0	0	0	722.1
2019	15.7	21.4	1	0	4	330.3	520	142.4	277	0	0		1311.8
2020	74.4	32.6	74.1	0	49.3	428.4	251.3	280.7	150.8	0	6	0	1347.6
												Average	**956.3**

Groundwater situation at the plant site

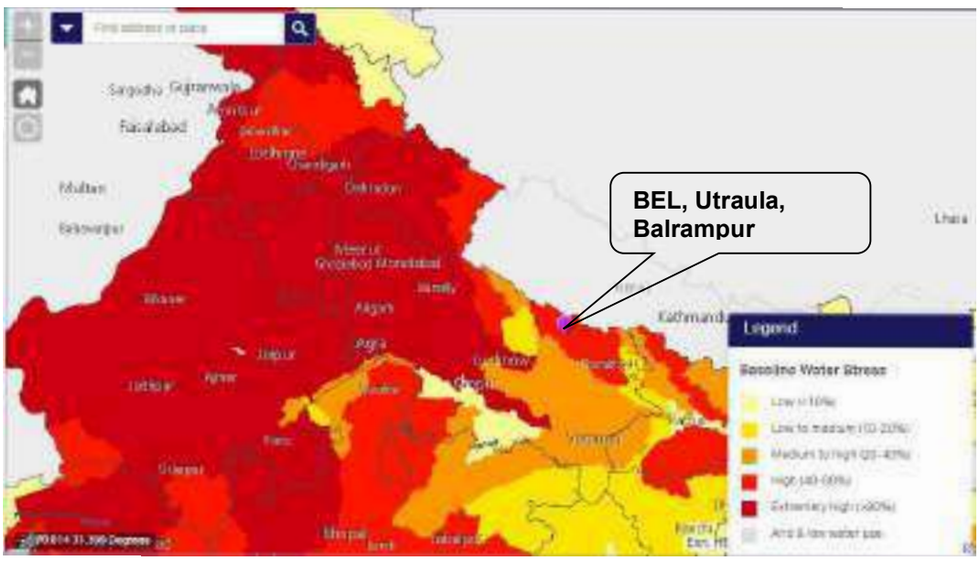
The stage of groundwater extraction as reported by CGWB (assessment year: 2017) is 28.29% which puts Balrampur district in the category of safe zone.



Source: India Water Tool 3.0

Figure 4.3 Groundwater Block Categorization of Balrampur district

As per the India water tool the block lies in High (40-80%) baseline water stress zone. Higher value indicates that there is more competition among users related to water for domestic, industrial, agriculture and other purpose



Source: India Water Tool 3.0

Figure 4.4 Baseline Water Stress of Balrampur District

4.3 Water Supply & Distribution Details

The water extracted from any of the 3 borewells is pumped through a common header line to the cooling towers, inlet to DM plant and for domestic water utilization. The major water consumer in the unit is the cooling tower.

For generation of DM water, the raw water from the borewells is first fed to a Multi Grade Filter (MGF) followed by a 2 stage RO system of 16 m3/h (inlet) Capacity. The RO- permeate generated is fed to the DM plant which consists of Strong Acid Cation (SAC) followed by Strong base Anion (SBA) followed by Mixed Bed (MB). The reject from the RO and regeneration from the SAC, SBA & MB go to the N-pit. The DM water generated post MB is stored in 2 nos. DM water storage tanks of 150 m^3 and 200 m^3 (total DM water storage capacity 350 m^3) The DM water is used as feed to the boiler.

4.4 Water Balance

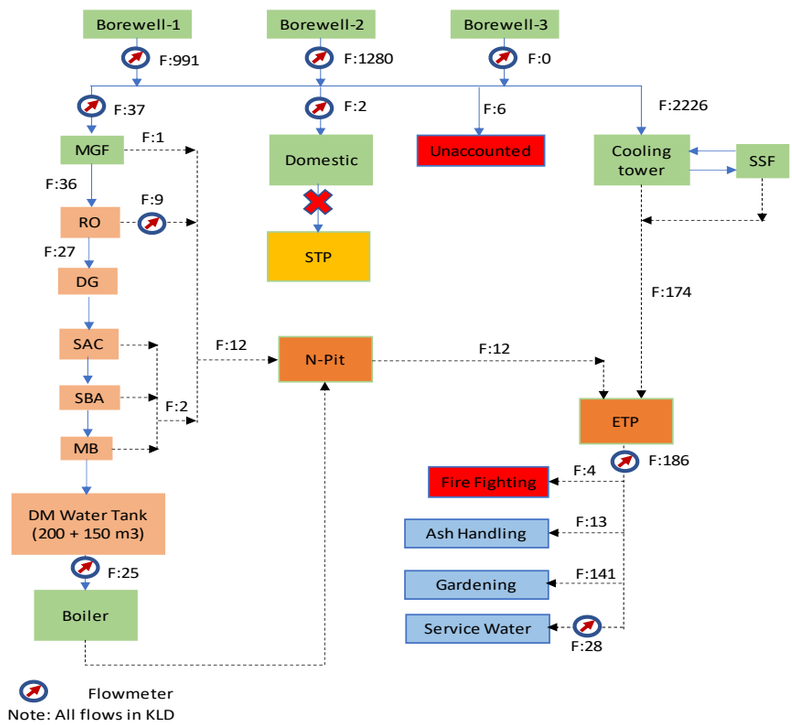


Figure 4.5 Water Distribution network diagram

NOTE: This balance has been prepared on average of the data from October 2020 – September 2021

Overall plant water balance is shown below in tabular form in table 4.4

Table 4.4 Overall Water Balance (Daily Average)

Fresh water Balance			
Sno.	**Description**	**Quantity (KLD)**	**Remarks**
1	Inlet from BW-1	991	FM reading
2	Inlet from BW-2	1280	FM reading
3	Inlet from BW-3	0	FM reading
	Total freshwater Inlet	**2271**	
Fresh water Distribution			
4	Inlet to DM Plant	37	FM reading
5	For Domestic Water Consumption	2	FM reading
6	As Cooling Tower Makeup	2226	FM reading
	Total Fresh Water Distribution	**2265**	
7	Unaccounted	6	
DM Plant water balance			
8	Inlet to MGF	37	
9	MGF Backwash	1	
9	RO Inlet	36	
10	RO Reject	9	
11	Inlet to DM Plant SAC	27	
12	SAC Regeneration	2.00	
13	SBA Regeneration		
14	MB Regeneration		
15	DM water feed to Boiler	25	

4.5 Domestic water Consumption

Present domestic water consumption is 2 m^3/day (based on flowmeter readings). Domestic water consumption in the plant is accounted for applications like drinking, hand wash and toilet flushing.

The water supply and usage patterns were discussed with plant personnel and the observations are as follows:

- Separate meter is installed for measurement of domestic water consumption for the Plant.
- Water closets in plant are of western type with single flush type. However, the size of cisterns are large.

- ❖ Handwash taps in the plant are normal bib taps.
- ❖ Canteen is not present in the plant

- ❖ Total number of consumers (Permanent+ workers+ Visitors) = 210
- ❖ Water Consumption = 2 m^3/day
- ❖ Per capita Consumption = 9.5 LPCD

As per CGWA gazette notification, the recommended domestic water requirement is 30 LPCD

The domestic water consumption is well within limits as compared to the benchmark.

4.6 Rainwater Recharge & Harvesting

During the water audit study of the plant, it was found that plant is practicing the rainwater recharge by means both rooftop and paved area drainage through storm water drainage network.

Rainwater harvesting potential is the total amount of rainwater that can be harvested from a given site throughout the year. It can be calculated using the following formula:

Rainwater Harvesting Potential (KL) =
Catchment Area (sq.m.) x Average Annual Rainfall (m) x Run-off Coefficient

Average Annual Rainfall for Balrampur[1] = 956.3 mm

The following table summarizes the total rainwater harvesting potential from the plant:

Table 4.5 Rainwater Recharge potential

Description	Area (m^2)	Runoff coefficient	Annual Rainfall (mm)	RWH Potential (KL)
Rooftop area (m^2)	4802	0.85	956.3	4081
Paved Area (m^2)	59400.2	0.65		36923
Green Area (m^2)	48783	0.15		6997
Unpaved area (m^2)	56004.3	0.15		8033
Total				**56034**

[1] Source: IMD: 2016-2020

It can be seen from the table above that there exists rainwater harvesting potential of 55623 KL throughout the plant.

4.7 Water Metering & Monitoring System

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. The presence and regular monitoring of flow meters ensures that the flows in the plant are well accounted. During the audit, the available flow meters were identified, and their working conditions were checked. The plant has installed flowmeters at various strategic locations, the flowmeter readings in comparison with ultrasonic flow meter readings have been detailed in annexure 2.

4.8 Water Costing

The cost of the different types of water is illustrated given below in table:

Table 4.6 Water Cost

S. No.	Description	Total Cost (Rs./m^3)
1	Borewell Water (as per charges by UP ground water authority)	5.0

5. Water & Wastewater Treatment Practices

This section provides the detailed analysis of the data along with the key findings.

The effluent generated from the plant is treated in an Effluent Treatment Plant (1000 KLD) and the treated effluent is used for gardening, ash handling, dust suppression, firefighting etc.

Table 5.1 Wastewater Discharge Status (Daily Average)

S. No.	Description	Quantity (KLD)	Mode of Disposal
1	Cooling Tower Blowdown	174	Effluent Treatment Plant
2	MGF Backwash	1	
3	RO Reject	9	
4	SAC Regeneration	2	
5	SBA Regeneration		
6	MB Regeneration		

5.1 Raw/Fresh water Treatment

The water from all three borewells is supplied to the Water treatment plant. The treatment plants consist of MGF and RO system followed by DM plant. Though they have installed softener, but at the time audit it was not operational and as per inputs from the plant team the softener is not being used at all. The water after passing to the RO system, goes to the DG, SAC, SBA and MB. The DM water generated post MB is stored in DM water storage tanks of 150 m^3 and 200 m^3. The wastewater from the MGF backwash, RO Reject and DM plant regeneration is collected into the N-pit from where it is sent to the ETP plant for further treatment.

For cooling purpose, water is being fed through these three borewells into the cooling towers and its blowdown water is sent directly to the ETP after mixing with the N-pit discharge water. These borewells also meet the requirement for domestic purposes primarily for drinking purposes.

A schematic of the water treatment system inside the plant is shown below:

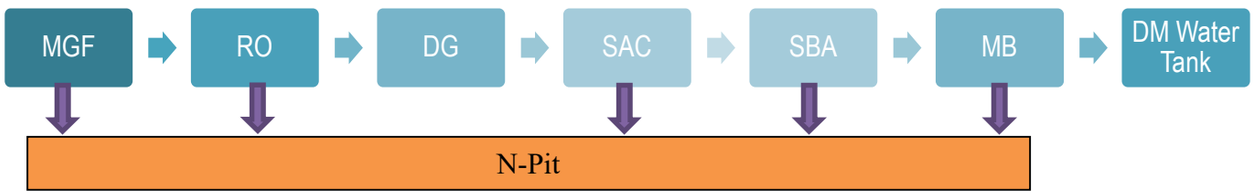


Figure 5.1: Schematic diagram of water treatment system

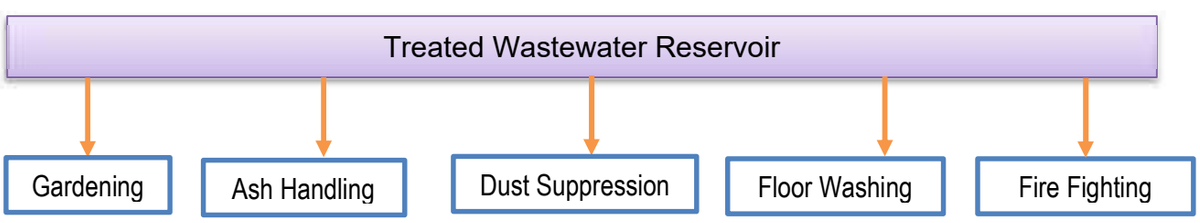
5.2 Waste Treatment & Disposal

The schematic of wastewater treatment and disposal is shown below



Figure 5.2 Schematic of Effluent Treatment plant

The treated water from the ETP is used for various secondary activities such as gardening, ash handling, dust suppression and floor washing.



5.3 Sewage Treatment

The plant has installed a Sewage treatment plant of 60 KLD capacity inside its township but as reported by the plant team, the pipeline connection is yet to be laid till the STP.

5.4 Environmental Compliance related to Water

- BEL, Utraula is currently extracting 2271 m^3/day (October 2020 – September 2021) against a permission of 7020 m^3/day (calculated based on rated discharge & permitted running hours).
- Plant has installed Electromagnetic flow meters at all the 3 borewells and at remaining locations Electromagnetic/ mechanical flow meters have been installed.
- 02 nos. Piezometer with Digital water level recorder and at four locations manual piezometer is used for water level monitoring in the campus in compliance of the NOC conditions. The piezometers with DWLR support telemetry.
- As per the NOC issued by Ministry of Jal Shakti, Government of Uttar Pradesh the plant has to adopt rainwater harvesting/ recharge in the project premises. 2 nos. rainwater harvesting pits have also been constructed within the campus to collect rainwater from the paved roads and cemented sideways.
- Ground water quality is being regularly monitored through inhouse laboratory and the samples are also sent to NABL accredited lab for testing. The reports have been attached along in annexures.
- As per UPPCB Consent order, the domestic sewage generated within theplant premises should be treated in a sewage treatment plant. A sewage treatment plant of 60 KLD has been installed in the township but pipeline connecting plant to the STP is not yet in place.

6. Water Conservation Opportunities

6.1 Water Saving Proposal 1: Reuse of filter backwash (MGF) water after settlement in a settling tank

6.1.1 Present Status

Presently the MGF backwash being generated from the Multi Grade Filter is being discharged into the common drain which goes to the N-pit.

The schematic of the present system is shown below:

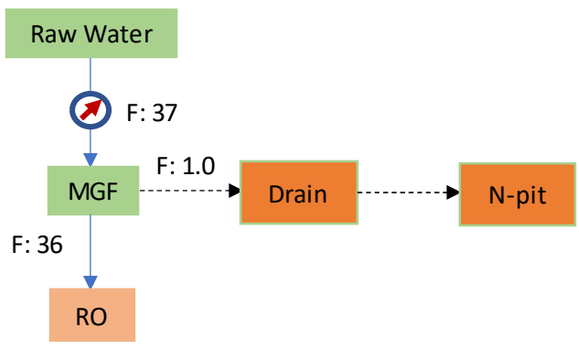


Figure 6.1: Schematic of present system of MGF Backwash

6.1.2 Recommendation

It is recommended to reuse the backwash water from the MGF and instead of sending it to the N-pit, the filter backwash should be stored in a settling tank to store water and allow for settlement of the supernatant particles. This backwash water does not have any impurities except for suspended particles and after settlement, the supernatant water quality will be equivalent to the raw water quality.

The schematic of the proposed system is shown below:

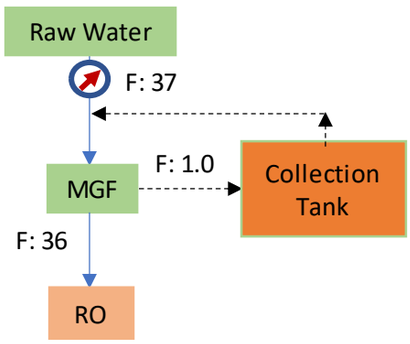


Figure 6.2: Schematic of proposed system of MGF Backwash

6.1.3 Benefits

The fresh water saving potential of about 1.0 m^3/day with cost benefit analysis as below.

Table 6.1 Cost – Benefits: Reuse of filter backwash (MGF) water after settlement in a settling tank

Estimated Parameters	Units	Based on Raw water cost @ Rs. 5.0/m^3 (as per UP Ground Water Authority)
Daily water savings	m^3/day	1.0
Annual water savings	m^3/year	365
Annual cost Savings	Rs. Lakhs	0.01
Investment Required	Rs. Lakhs	0.1

6.2 Water Saving Proposal 2: Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup

6.2.1 Present Status

Presently the ETP treated water is being used for low end applications such as Ash handling, Gardening, Coal yard dust suppression, sprinkling on road etc. This water has great potential to reduce the freshwater makeup to the cooling tower.

The water reaching the ETP comprises of mostly cooling tower blowdown and water from the N-pit which is a combination of DM plant regeneration and MGF backwash.

6.2.2 Recommendation

It is recommended to install a 3 stage RO system with MEE system to treat excess ETP treated water which presently is being used for gardening.

The capacity of the RO should be 105 KLD or approximately 10 KL/h considering 10 hours working. The overall recovery of the system will be 95% and the remaining 5% would get converted to salt through MEE.

6.2.3 Benefits

The fresh water saving potential of about 100 m^3/day with cost benefit analysis as below.

Table 6.2 Cost – Benefits: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5.0/m^3 (as per UP ground water authority)**
Daily water savings	m^3/day	100
Annual water savings	m^3/year	36,500
Annual cost Savings	Rs. Lakhs	1.82
Estimated cost (Approx)	Rs. Lakhs	100
Payback Period	Years	55

7. Implementation Plan

To better understand and comprehensively assess the water usage in the various processes and explore possibilities of water saving, Bajaj Energy Limited and CII- Water Institute partnered to undertake a detailed water audit of the plant.

The previous chapter detailed out the water saving proposals along with the key recommendations and, costs and benefits to the plant from their adoption. This chapter summarizes the key points emerging along with the way forward towards formulation of a Water Efficiency Plan.

The summary of total water savings emanating from proposed water saving proposals is shown in table 8.1.

Table 7.1 Water saving projects: summary for recommendations

I	**Total Fresh Water Intake (Average)**	**2271 m^3/day**		
II	**Savings Achievable**	**101 m^3/day**		
	Water Saving Potential (%)	**4.44 %**		
Recommended Projects				
Sno.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	1	0.01	0.1
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	1.82	100
Observations				
1	Overflow from the cooling tower sump happens during plant shutdown as bypass arrangement was not in place			

7.1 Conclusions

7.1.1 Conclusion 1

Water balance across the plant has been successfully achieved
Total consumption: 2271 m^3/day (Daily Average)

7.1.2 Conclusion 2

Strategies identified for reduction, reuse and recycle show:

- Around 4.44 % saving can be achieved.
- Reduction in freshwater makeup for the cooling tower high potential to reduce overall groundwater withdrawal

7.1.3 Way Forward

❖ Prioritize projects

- Priority areas where immediate savings can be achieved include reuse of filter backwash water (MGF) after settlement in a settling tank.
- Installation of a RO system for treatment of ETP treated water has good potential to reduce the cooling tower freshwater makeup.
- Rainwater collection and harvesting is an important project and could be executed.
- Need to adopt schemes for water management and conservation (Recycle, Reuse and Reduce options)
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Monitor proposal-by-proposal

❖ Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.

❖ Internal audits to be undertaken at Bajaj Energy Limited units; third party audits also recommended.

Annexure I: Data Received from Plant Team

Water Consumption data

Borewell	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Total (KL/Annum)	Avg (KLD)
Borewell-1	40547	562	17034	20669	13628	6375	49425	8858	50900	52953	56138	44492	361579	**991**
Borewell-2	40803	683	17606	36578	13034	4716	65084	17095	63771	66083	77988	63922	467361	**1280**
Borewell-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Specific Water Consumption data

	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Average
Water consumption (m3)	81350	1245	34639	57247	26672	11081	114508	25953	114670	119036	134125	108414	828940
Production – Power (MWh)	28235	0	12358	21808	9606	1011	39452	8189	39820	40310	48645	36997	286431
Specific Water Consumption (m3/MWh)	2.9	-	2.8	2.6	2.8	11.0	2.9	3.2	2.9	3.0	2.8	2.9	2.89

Cooling Tower Details

S. No.	Description	Recirculation Rate, m^3/hr
1	CT-1	17200

Piezometer Reading

Month	Old office	Boiler stack	CHP	Project office	CHP WB
	Manual	Manual	Manual	Online	Online
Oct-21	0.87	1.7	1.45	0.73	1.37
Sep-21	0.65	0.67	0.86	0.48	1.94
Aug-21	0.25	0.32	0.26	-0.19	0.35
Jul-21	1.41	1.57	1.72	2.71	2.34
Jun-21	0.9	1.03	1.22	1.88	1.28
May-21	3.1	3.25	3.42	3.71	3.05
Apr-21	6.35	6.14	6.35	6.19	6.28
Mar-21	5.7	5.6	5.5	5.11	5.23
Feb-21	5.02	5.24	4.99	5.12	5.18
Jan-21	3.28	3.11	3.07	3.09	3.24
Dec-20	3.16	3.23	2.97	2.96	2.88
Nov-20	2.59	2.3	2.44	2.44	2.35
Oct-20	1.67	1.6	1.58	1.64	1.7
Sep-20	1.08	1.11	1.07	1.23	1.3
Aug-20	1.41	1.53	1.79	1.57	1.44
Jul-20	1.53	1.64	1.76	1.57	1.44
Jun-20	1.2	1.22	1.32	1.56	1.53
May-20	4.35	4.55	4.6	4.59	4.39
Apr-20	3.42	3.84	3.88	4.1	3.6
Mar-20	3.06	2.94	3.06	3.52	3.08
Feb-20	1.78	1.94	1.92	2.08	2.58
Jan-20	1.8	1.92	1.88	1.88	2.56
Dec-19	0.47	0.46	0.51	1.15	_
Nov-19	0.43	0.39	0.45	0.8	_
Oct-19	_	_	_	_	_
Sep-19	_	_	_	_	_
Aug-19	0.47	1.15	0.46	_	_
Jul-19	0.43	0.48	0.39	_	_
Jun-19	6.2	6.21	6.22	_	_
May-19	5.05	5.04	4.84	_	_
Apr-19	5.03	5.02	5.01	_	_
Mar-19	3.59	3.58	3.59	_	_
Feb-19	3.79	3.75	3.9	_	_
Jan-19	3.96	3.91	3.94	_	_
Dec-18	_	_	_	_	_
Nov-18	_	_	_	_	_

Annexure II: Minimum Water Requirement

Annexure-2: Minimum Water Requirement
In view of the Gazette of India Notification Part II- Section 3 – Sub-section (ii) (CG-DL-E-24092020-221952, No. 2941), dated September 24, 2020, " All industries abstracting ground water in excess of 100 m3 /d shall be required to undertake annual water audit through Confederation of Indian Industry (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/PHDCCC certified auditors and submit audit reports within three months of completion of the same to CGWA".
An attempt was made to understand the minimum water required for regular plant operations.
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m3/MWH.
The specific water consumption for Bajaj Energy Limited, Utraula, Balrampur is 2.89 m3/MWh of power generated (October 2020 – September 2021) Since the plant was running at less than the full load due to COVID-19 pandemic and coal shortage, approximately 2271 m3/day (average of October 2020 – September 2021) of water was being used for the plant operations.
The details of NOC for withdrawal of ground water are as under:

Water withdrawal permission as per CGWA NOC				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
13	Registration no. 202108000332	972000	KL/Annum	
14	Registration no. 202108000181	756000	KL/Annum	
15	Application no. BLMP0821NIN0011	378000	KL/Annum	
16	Total water withdrawal NOC	2106000	KL/Annum	
E	**Permissible water withdrawal at 100% load**	**7020.0**	**KL/day**	**300 days working**
F	**Permissible water withdrawal at 70% load**	**4914.0**	**KL/day**	**300 days working**
Condition A: Plant working at 100% load condition				

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
1	Design recirculation rate	17200	m3/h	

2	Actual recirculation rate	16104		
3	COC	7		
4	Temperature difference	10		
5	Evaporation loss	5913	m3/day	
6	Drift Loss	77.3	m3/day	considering 0.02%
7	Blowdown	985.6	m3/day	
A	**Total makeup to the cooling circuit**	**6976.3**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
8	Total Staff Strength	210	Nos.	
9	Floating population	50	Nos.	
10	Recommended domestic water consumption	30	LPCD	
11	Total Domestic water consumption	7.8	m3/day	
12	Considering 15% extra	9.0	m3/day	
B	**Domestic Water Requirement**	**9**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**65**	**m3/day**	

D	**Total Minimum water requirement at 100 % load**	**7050.2**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
13	Cooling tower blowdown	985.6	**m3/day**	
14	Permeate recycled in cooling tower	591.3	**m3/day**	
15	Reject	394.2	**m3/day**	The reject will be used for dust suppression & ash quenching
16	New minimum water demand at 100% load	6458.9	**m3/day**	
17	Saving potential over NOC quantity	7.99%		

Case-2 : Saving potential with COC increased to 9				
18	COC	9		
19	Blowdown	739.2	**m3/day**	

20	Permeate recycled in cooling tower	443.5	**m3/day**	60% recovery
21	Reject	295.7	**m3/day**	The reject will be used for dust suppression & ash quenching
22	New minimum water demand at 100% load	6360.3	**m3/day**	
23	Saving potential over NOC quantity	9.40%		
Maximum saving possible at 100% load is 9.40% over NOC quantity				

Condition B: Plant working at 70% load condition

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
24	Design recirculation rate	17200	m3/h	
25	Actual recirculation rate	11272.8		at 70% load
26	COC	7		
27	Temperature difference	10		
28	Evaporation loss	4139.4	m3/day	
29	Drift Loss	54.1	m3/day	considering 0.02%
30	Blowdown	689.9	m3/day	
A	**Total makeup to the cooling circuit**	**4883.4**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
31	Total Staff Strength	210	Nos.	
32	Floating population	50	Nos.	
33	Recommended domestic water consumption	30	LPCD	
34	Total Domestic water consumption	7.8	m3/day	
35	Considering 15% extra	9.0	m3/day	
B	**Domestic Water Requirement**	**9**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**65**	**m3/day**	

D	**Total Minimum water requirement**	**4957.3**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7

36	Cooling tower blowdown	689.9	**m3/day**	
37	Permeate recycled in cooling tower	413.9	**m3/day**	60% recovery
38	Reject	276.0	**m3/day**	The reject will be used for dust suppression & ash quenching
39	New minimum water demand at 100% load	4543.4	**m3/day**	
40	Saving potential over minimum water requirement	8.35%		Considering same COC
41	Saving potential over NOC quantity	7.54%		

Case-2 : Saving potential with COC increased to 9				
42	COC	9		
43	Blowdown	517.4	**m3/day**	
44	Permeate recycled in cooling tower	310.5	**m3/day**	
45	Reject	207.0	**m3/day**	The reject will be used for dust suppression & ash quenching
46	New minimum water demand at 100% load	4474.4	**m3/day**	
47	Saving potential over minimum water requirement	9.74%		Considering COC of 9
48	Saving potential over NOC quantity	8.95%		

Maximum saving possible at 70% load is 8.95%

Annexure III: Measurements done by CII

Bajaj Energy Limited, Utraula, Balrampur					
Flow measurement Sheet					
Sno.	Meter Location	Type of meter	Meter reading		Remarks
			CII	BEL	
1	Borewell-1	EM	155	150	
2	Borewell-2	EM	150	147	
3	Borewell-3	EM	148	149	
4	DM Plant Inlet	EM	16.5	16	
5	RO-Permeate	EM	11.4	11.8	
6	RO-Reject	EM	4.55	4.02	
7	ETP Outlet	Mechanical	50.5	52.9	
8	CWP-1	NA	7528		
9	CWP-2	NA	7200		
10	CWP-3	NA	7617		
11	DM water to boiler	EM	27.4	28	
12	Service water	Mechanical	31.33	32.2	
13	MB outlet	EM	11.3	11.2	
14	Transfer pump - Ash water	Mechanical	10.5	10.58	
15	Potable water pump	NA	35.2		

Annexure IV: Drinking water standard IS 10500 (2012)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

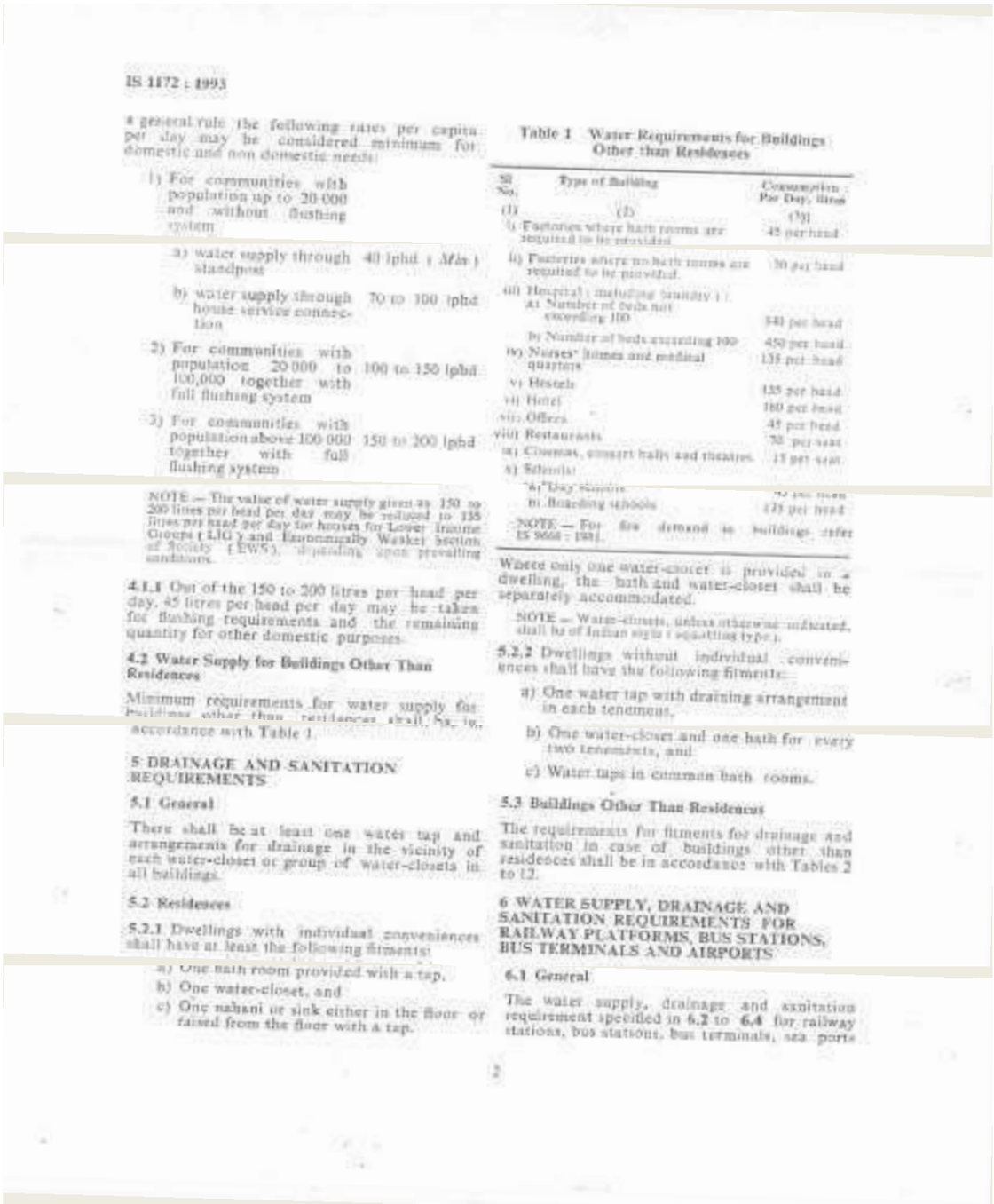
Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

Annexure V: IS 1172: 1993 Code of Basic Requirements for water supply, drainage and sanitation



IS 1172 : 1993

As a general rule the following rates per capita per day may be considered minimum for domestic and non domestic needs:

1) For communities with population up to 20 000 and without flushing system

a) water supply through standpost — 40 lphd (*Min*)

b) water supply through house service connection — 70 to 100 lphd

2) For communities with population 20 000 to 100 000 together with full flushing system — 100 to 150 lphd

3) For communities with population above 100 000 together with full flushing system — 150 to 200 lphd

NOTE — The value of water supply given as 150 to 200 litres per head per day may be reduced to 135 litres per head per day for houses for Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions.

4.1.1 Out of the 150 to 200 litres per head per day, 45 litres per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

4.2 Water Supply for Buildings Other Than Residences

Minimum requirements for water supply for buildings other than residences shall be, in accordance with Table 1.

Table 1 Water Requirements for Buildings Other than Residences

Sl No.	Type of Building	Consumption Per Day, litres
(1)	(2)	(3)
i)	Factories where bath rooms are required to be provided	45 per head
ii)	Factories where no bath rooms are required to be provided	30 per head
iii)	Hospital (including laundry) :	
	a) Number of beds not exceeding 100	340 per head
	b) Number of beds exceeding 100	450 per head
iv)	Nurses' homes and medical quarters	135 per head
v)	Hostels	135 per head
vi)	Hotel	180 per head
vii)	Offices	45 per head
viii)	Restaurants	70 per seat
ix)	Cinemas, concert halls and theatres	15 per seat
x)	Schools:	
	a) Day scholar	70 per head
	b) Boarding schools	135 per head

NOTE — For fire demand in buildings refer IS 9668 : 1981.

Where only one water-closet is provided in a dwelling, the bath and water-closet shall be separately accommodated.

NOTE — Water-closets, unless otherwise indicated, shall be of Indian style (squatting type).

5.2.2 Dwellings without individual conveniences shall have the following fitments:

a) One water tap with draining arrangement in each tenement,

b) One water-closet and one bath for every two tenements, and

c) Water taps in common bath rooms.

5.3 Buildings Other Than Residences

The requirements for fitments for drainage and sanitation in case of buildings other than residences shall be in accordance with Tables 2 to 12.

6 WATER SUPPLY, DRAINAGE AND SANITATION REQUIREMENTS FOR RAILWAY PLATFORMS, BUS STATIONS, BUS TERMINALS AND AIRPORTS

6.1 General

The water supply, drainage and sanitation requirement specified in 6.2 to 6.4 for railway stations, bus stations, bus terminals, sea ports

5 DRAINAGE AND SANITATION REQUIREMENTS

5.1 General

There shall be at least one water tap and arrangements for drainage in the vicinity of each water-closet or group of water-closets in all buildings.

5.2 Residences

5.2.1 Dwellings with individual conveniences shall have at least the following fitments:

a) One bath room provided with a tap,

b) One water-closet, and

c) One sahani or sink either in the floor or raised from the floor with a tap.

Annexure VI: Borewell & ETP Quality test reports

NOIDA TESTING LABORATORIES

(A Government Approved Testing Laboratory)

(An ISO :9001 : 2015 & ISO 45001 : 2018 Certified Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & HSPCB Recognized Laboratory

☎ +91-9313616842, 8510081921, 7503031145, 8527870872, 7503031146, 9999794569

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-017	14/08/2021

Issued To: M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 06/08/2021 To 14/08/2021
Sample Description : Ground Water Collected from Ash Pond (Towards ETP)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.29	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	423	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
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4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	58.12	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	37.60	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.28	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.129	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	32.50	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	4.12	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	54.80	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	212.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	280.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as NI)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection Limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report unless until specified by the customer.

NTL

CHECKED BY **AUTHORIZED SIGNATORY**

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-018	14/08/2021

Issued To: M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Received On	:	06/08/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	06/08/2021 To 14/08/2021
Sample Description	:	Ground Water Collected from Power Plant Gate

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500-2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.24	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	312	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	72.35	mg/l	75	200

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7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	15.80	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.32	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.154	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	18.26	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.60	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	32.16	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	256.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	312.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	6.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
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4. This test report will not be used for any publicity/legal purpose.
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-019	14/08/2021

Issued To: M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 06/08/2021 To 14/08/2021
Sample Description : Ground Water Collected from Coal Storage Yard

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.35	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	486	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0

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6.	Calcium (as Ca)	IS: 3025 (P- 40)	62.52	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	18.21	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.36	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.185	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	20.36	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.48	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	27.18	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	336.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	288.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	7.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-020	14/08/2021

Issued To: M/S. Bajaj Energy Limited,
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 06/08/2021 To 14/08/2021
Sample Description : Potable Water from Pantry

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.20	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	74.0	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	8.82	mg/l	75	200

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7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	3.99	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	<0.1	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	<0.05	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	, 4.34	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	<1.0	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	4.12	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	44.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	40.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	8.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Remarks – As per IS 10500: 2012, standards the sampled water is suitable for potable, purpose.

Notes:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-020	14/08/2021

Issued To: M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Received On	:	06/08/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	06/08/2021 To 14/08/2021
Sample Description	:	Potable Water from Pantry

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.20	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	74.0	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	8.82	mg/l	75	200

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-060821-015	14/08/2021

Issued To M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/08/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1ltr/Plastic Cane
Analysis Duration	:	06/08/2021 to 14/08/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.04	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	136	mg/l
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B-2005	380	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	65.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	2.8	mg/l

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY **AUTHORIZED SIGNATORY**

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar, Kalgodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com *W.*: www.noidalabs.com

NOIDA TESTING LABORATORIES

(A Government Approved Testing Laboratory)

(An ISO :9001 : 2015 & ISO 45001 : 2018 Certified Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & BSPCB Recognized Laboratory

+91-9313611642, 8510001921, 7505031145, 8527670572, 7505031146, 9999794369

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-060821-016	14/08/2021

Issued To M/S. Bajaj Energy Limited.
Vill- Italmaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/08/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	ETP Outlet
Sample Quantity/Packing detail	:	1lt/Plastic Cane
Analysis Duration	:	06/08/2021 to 14/08/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11):1983	7.26	-	5.0-9.0
2.	Total Suspended Solid	IS:3025(Part-17):1984	15.2	mg/l	100
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B:2005	58.0	mg/l	250
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	16.0	mg/l	30
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l	10

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
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Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
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Branch Office : Gayatri Nagar, Kaigodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com W.: www.noidalabs.com

Annexure VII: Water Saving Gadgets

Electronic Taps (e-taps)

The latest trend in industries is to install electronic taps (e-taps). The advantages of using e-taps are as mentioned below:

- Unlike conventional taps, there is no twisting or turning in e-taps. They have a sensor, which cuts off water supply completely when not in use. This helps in saving up to 70% water during hand wash

- E-taps enable hands free operation. No fear of cross contamination or contact with germs. E-taps score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.

- E-taps can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.

- The touch free electronic taps, available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Operation of Electronic Taps

This has been successfully implemented in several hotels & restaurants. Of late, several industries have also started implementing this proposal.

Thus, there is a good potential to optimize the freshwater consumption by replacing the existing taps with e-taps.

Electronic flush (e-flush) urinals

The latest trend in industries is to install e-flush urinals. The advantages of using e-flush urinals are as mentioned below:

- E-flush urinals are fitted with a sensor, which senses the usage and flush with water for few seconds after use. This helps in saving 70% water during urinal flush
- E-flush urinals enable hands free operation and score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.
- E-flush urinals can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.
- The touch free e-flush urinals available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.



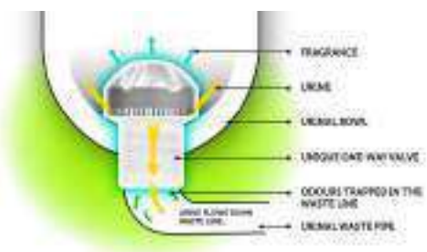


Photographs: Electronic flush urinals

Waterless urinals

Waterless urinals eliminate 100% water usage in urinal flush. The concept is based on blue seal technology. The patented blue seal density is lesser than urine and hence allows the passage of urine and acts as a protective layer. The blue seal also eliminates odour emanating from urine. The blue seal is bio-degradable and has to be replaced once in 5000-7000 usages.



Photographs: waterless urinals

Hand wash
NEERR nozzles

Demonstration conducted at a site showed a water saving of 92.18% in the mist mode, 85% in the foam mode and 60% with the normal aerator nozzle.



Photographs: Basic Aerator, NEERR nozzle: Foam Mode and NEERR nozzle: Mist Mode

Thus, 85% water saving can be assumed though installation of these NEERR nozzles.

Technical details about the product: NEERR[2] nozzles are based on water A.R.T. (Atomizer Reduction Technology)[3], which atomizes the water and creates a heavy mist, hence reducing the consumption in any washing application by up to 95%. There are two modes available in the same nozzle:

Mist Mode: Saves up-to 95% water (at 3 bar pressure). It is perfect for daily utility activities like brushing, washing dishes etc.

Normal Mode: With a twist, Neerr switches to normal mode, which still saves up to 75% water (at 3 bar pressure). It is more useful while filling glasses, pots etc.

Installation: Retrofits into the existing tap**;** Unscrew the existing aerator and insert the Neerr Nozzle.

Dimensions: Fits Standard (20.8 mm), Junior (18.1 mm) and Tom Thumb (15 mm) sized taps (inner socket dimension)

Material: Lead Free Brass (Chromed Handles)

Water Pressure: 1.2 – 8bar. (Suitable for low pressure water systems).

Water Temperature: Max 192 degree F / 89 degree C

[2] NEERR™ is a product innovated by ZeFi Labs with RETAS as Marketing Partner
[3]It is a patent pending technology by ZeFi Labs

Foam taps

Conventional taps are used in the hand wash areas which results in large quantity of fresh water. Foam taps are a better fit in these high consumption areas. They consume 25-30% less than the conventional taps.





Photographs: Foam taps

Spring loaded Push taps

Spring loaded push type tap is an alternate device for minimizing hand wash Water. The spring-loaded push taps operate with the simple mechanism of pressing the knob for water. The knob automatically released back to close position in 5-7 seconds. This saves about 30-40% of water compared to the conventional taps





Photographs: Spring loaded push taps

Low flush cistern

The latest model closets are water efficient and operate in dual mode with single flush releases 2 liters and dual flush releases 4 liters per flush. This results in large quantity of water savings.





Photographs: Low flush cisterns

Annexure VIII: Suggestive List of Vendors for providing water saving equipment/technology/consultancy

a. Supplier Addresses of Water & Wastewater Treatment Systems and Water Saving Devices

1. Hitech Enviro Engineers & Consultants Pvt. Ltd.
Address: Plot No : A-1, Ground Floor,
Kaushambi, Ghaziabad – 201010
Tel: 0120– 4294461-63,
Fax: 0120- 4294462
Email: projects@heecpl.com
Website: www.heecpl.com
Contact Person: Mr. Hitesh Mittal (Director)

2. Arvind Envisol Ltd.,
Address: Naroda Road, Ahmedabad,
Gujarat-380025
Tel: 079 30138000
Fax: 079 30138677
Email: ashini.shah@arvind.in
Website: www.arvind.com
Contact Person: Mr Ashini Shah

3. GE India Industrial Pvt. Ltd
Address: Building No 7A, 5th Floor DLF Cyber City,
DLF Phase III, Sector 25A, Gurgaon
Haryana – 122002
Tel: 0124 4808016
Mobile: 09999907981
Email: himanshu.gupta@ge.com
Contact Person: Mr Himanshu Gupta

4. Genesis Membrane Sepratech Pvt. Ltd
Address: No18, Vardhaman Complex
No 10, L.B.S Marg, Vikhroli (West)
Mumbai – 400 083
Tel: 022-5775456 / 5775458
Fax: 022-5790608
Mobile: 9322229520
Email: genesis@bom5.vsnl.net.in
Contact Person: Dr BibhashChakravorty

5. Ion Exchange India Ltd
Address: Block B, Flat No.8, Local Shopping Center
Ring Road, NarainaVihar
New Delhi - 110 028
Tel: 011 2577 1160/0862/6061/6065
Fax: 011 2577 4837
Email:delcro@ionexchange.co.in

6. Jindal Water Infrastructure Ltd
Address: Jindal ITF Centre, 28 ShivajiMarg, New Delhi 110015
Telephone: 011-45021983, 45021984
Fax: 011-45021982
Email: info@jindalaquasource.com
Website: www.jindalaquasource.com
Contact Person: Mr SudhirMalhotra, Sr Vice President

7. Doshi Ion Exchange & Chemical Industries Limited
Address: C – 147, Madhuban
Near Universal Public School
New Delhi 110092, India
Tel: +91-11-22502064 / 22022175
Fax: +91-11-22044979
Email: delhi@doshion.com

8. Max Pure Water Systems
Address: Near Bharat Petrol Pump,
Opposite Bharat Cancer Hospital,
Kumbharia Road, Saroli, Surat. Gujarat
Telephone: 0261-264 3894
Fax: 0261-264 0034
Mobile: 98980 43960, 98980 41900
E-mail: maxpurero@gmail.com; info@maxpurero.com
Website: www.maxpurero.com
Contact Person: Mr. Kailash Shah, Director

9. Chempure Technologies Pvt Ltd
Address: 28/1, Manjolai 2nd Main Road
Kalaimagal Nagar Extn., Ekkaduthangal
Chennai – 600097
Tel: 044-22250173 / 22250162
Fax: 044-22250867
Mobile: 9444076114
Email: chempure@vsnl.net
Contact Person: Mr Leo Vino

10. **Pentair Water India**
    Address: L/52-55, Verna Industrial Estate
    Verna, Salcette
    Goa – 403 722
    Tel: 0832-2883300
    Fax: 0832-2883312
    Contact Person: Mr MritunjayChaubey

11. **Nuchem Weir India Limited**
    Address: E-46/12, Okhla Industrial Area,
    Phase - II , New Delhi - 110 020
    Tel: 26385737, 26383234, 26384656
    Fax: 51611846
    Manager-Water Treatment
    Email: msakhtar@nuchemweir.com
    Contact Person: Mr M.S.Akhtar

b. Flow Meters (Fixed/Portable)

1. **Forbes Marshall Pvt. Ltd.**
    Address: A-34/35, MIDC, H Block,
    Pimpri, Pune-411018, Maharashtra
    Telephone: 020-2744 2020
    Fax: 020-2744 2420, 2040
    Mobile: 98505 67714
    E-mail: rmishra@forbesmarshall.com
    Website: www.forbesmarshall.com
    Contact Person: Mr Rakesh Mishra,
    Head - Water Business

2. **Iota Flow Systems Pvt Ltd**
    Address: A-2/13 Phase II ,Industries Area,
    Maya Puri, New Delhi - 1100 064
    Tel.: 91-11-46254601-08 Extn 17
    Moblie: 09958609393
    Fax: 91-11-46880020
    Email: sunil@iotaflow.com
    Contact Person: Mr Sunil Yadav

3. **GE India Industrial Pvt. Ltd**
    Address: Building No 7A, 5th Floor DLF Cyber City,
    DLF Phase III, Sector 25A, Gurgaon
    Haryana – 122002
    Tel: 0124 4808016
    Email: Srikanth.Kommu@ge.com

Contact Person: Mr Srikanth Kommu

4. **Rockwin Flowmeter India Pvt Limited**
   Address: B-24, Site IV,
   Sahibabad Industrial Area,
   Ghazibad-201010, Uttarpradesh
   Tel: 0120-2895400, 2896286, 2895079
   Fax: 0120-2895450
   Mobile: 9810129687, 9331052312, 9381026604
   E-mail: rajiv@rockwin.com; Mumbai@rockwin.com; rockwinkolkata@vsnl.net; rockwinchennai@vsnl.net
   Website: www.rockwin.com
   Contact Person : Mr Rajiv Prakash

5. **Orbit Technologies Pvt. Ltd.,**
   Address: B-50, Sanathnagar Industrial Area,
   Hyderabad-500018
   Ph: 040-67216354
   Fax: 040-23801579
   Email : orbit@orbitindia.com
   Website :www.orbitindia.com

c. **Water Saving Gadgets (e-flush, e-taps, Foam taps, dual flush cisterns & low flow showers)**

1. **Hindustan Sanitary ware & Industries Ltd.**
   Address: Tewari House, 2nd Floor, 11 - B / 8
   Main Pusa Road, New Delhi - 110005
   Tele Phone: 011 - 2585 4656
   E-mail: nitinkulkarni@hindware.co.in
   Contact Person: Mr. Nitin Kulkarni, Head,
   Institutional Sale & Business Development

2. **Jaguar & Company Limited**
   Address: 306, Udyog Vihar,
   Phase-II, Gurgaon (INDIA)
   Hand Phone: 098110 23782
   E-mail: bandu@jaguar.com
   Contact Person: Mr.Bandhu,
   Asst. Manager Production

3. **Kohler India**
   Tele Phone : 0124 - 4319 685 / 86
   E-mail : indiacustomercare@kohler.com

4. **Parryware Roca Pvt. Ltd.**
   Address: 234, N.S.C. Bose Road,
   Dare House, 4th Floor, Chennai -600 001
   Tele Phone: 044 - 25306341
   Hand Phone: 98401 00544
   Fax: 044 - 25340034
   E-mail: muralit@parry.murugappa.com
   Website: www.parrywareroca.com
   Contact Person: Mr. T.Murali,
   Area Head (Institutional Sales)

5. **Viega International** - GEM Sanitary Appliances Pvt. Ltd.
   Address: A-57, Wazirpur Industrial Area, Delhi - 110 052
   Tele Phone: 011 - 2737 7802 / 03 / 05
   Hand Phone: 098101 56083
   Fax: 011 - 2737 7806
   E-mail: gemsanitary@vsnl.com
   Contact Person: Mr. C.S. Gupta

6. **BVG Falcon**
   Address: Hyderabad
   Tele Phone: 040 - 2309 5499
   Hand Phone: 98480 55507
   Contact Person: Mr.Goel, Director
   Head Institutional Sale & Business Development

d. Cooling Tower Equipments:

1. **Kemco Technologies India Private Limited**
   Suite 906, Surya Kiran,
   19 Kasturba Gandhi Marg,
   New Delhi 110001, India
   Tel: +91 11 4151 1177
   Fax: +91 11 4151 8989
   Mobile: +91 9364204800
   Email: junsodsod@kemcosc.com

2. **Raj Heat Exchangers & Cooling Towers**
   Address: 190-1/4, Sai Nagar,
   Sidco Industrial Estate (P.O.),
   Coimbatore-641021, Tamil Nadu
   Telephone: 0422-2672615, 2672592
   Mobile: 9443820160
   E-mail: info@rajheat.com
   Website: www.rajheat.com

Contact Person: Mr Nagarajana

3. **Sanosil Biotech Pvt. Ltd.**
   Address: Warden House, Sir P M Road, Fort, Mumbai-400001
   Telephone: 022-2287 2295
   Fax: 022-2287 3475
   E-mail: info@sanosilbiotech.com
   Website: www.sanosilbiotech.com

4. **Aquazone Systems & Engineering**
   Address: 1, Yash Plaza,
   25 Archna Industrial Estate,
   B/h. Nilkanth Hotel, Opp. Bharat
   Bobbins, 132 Ft. Ring Road,
   Ajit Mill, Rakhial,
   Ahmedabad-380023, Gujarat
   Telephone: 079-2909 2182
   Fax: 079-2909 2182
   Mobile: 98242 65617, 94277 02867
   E-mail: ozone@ozoneworld.com;
   ozonators@rediffmail.com;
   ozoneworld@gmail.com
   Website: www.ozoneworld.com

5. **Mm Aqua Technologies Ltd**
   Address: Behrampur Road, Khandsa,
   Gurgaon-122001, Haryana
   Telephone: 0124-221 4134
   Fax: 0124-426 5020
   E-mail: info@mmaqua.com
   Website: www.mmaqua.com
   Contact Person: Mr Santanu Paul, Manager

6. **Ozonetek Limited**
   Address: 30 Landons Road,
   Chennai-600010
   Telephone: 044-2641 4717, 18, 19
   Fax: 044-26414720
   E-mail: info@ozonetek.com; ozonetek@vsnl.com; support@ozonetek.com;
   kpatel@ozonetek.com
   Website: www.ozonetek.com
   Contact Person: Mr Dr K. Patel, Managing Director

7. **Cook Deck Aqua Solutions Pvt. Ltd.**
   Address: 121, Andheri Industrial Premises,
   Off Veera Desai Road, Andheri West,
   Mumbai-400053, Maharashtra
   Telephone: 022-6725 1401,
   2850 3670, 2850 5767
   Fax: 022-2673 1820
   Mobile: 98960 11623, 98201 06694
   E-mail: kpgwalani@cooldeckin.com;
   harsh@cooldeckin.com;marketing@cooldeckin.com
   Website: www.cooldeckin.com
   Contact Person: Mr K P Gwalani, Proprietor
   Mr Harsh Bhargava, Director

8. **Adwyn Chemicals Pvt. Ltd.**
   Address: 154-A, Pocket-1, Mayur Vihar, Phase-1, Delhi-110091
   Telephone: 011-2279 3281, 2275 7974
   Fax: 011-2275 7974, 2275 3765
   Mobile: 98101 74794
   E-mail: adwynchemicals@yahoo.co.in; adwyn@vsnl.com
   Contact Person: Mr Aditya Gupta, Director

Annexure IX: Guidelines for installation of Flow meter on Borewells

Digital Water Flow Meter with Telemetry for Groundwater extraction monitoring as per CGWA notification

Technical specifications

1. Specification of Tamper proof Electronic water meter with telemetry

Metering Technology	: Ultrasonic or Electromagnetic
Communication type	: LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G)
Tamper proof:	
a) Power source	: The meter shall be battery operated or UPS powered supply with provision of power OFF detection. The telemetry system units shall be battery operated or through external power supply. The metering data should be stored in the meter even if the telemetry system is off due to power failure.
b) Sealing	: The meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
Compliance	: The meter shall preferably be manufactured as per ISO 4064: 2014 Standards and shall have IP 68 ingress protection.
Accuracy	: The meter shall be of accuracy better than ± 2% for the operating flow range (from 10 % to 100 % of maximum flow rate).
Test certificate	: The meter manufacturer shall submit the latest test/calibration certificate of the meter, from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL) or any third party laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), for every meter.
Parameters to monitor	: The meter (since installation of the requisite water meter) shall transmit the following parameters to a

	secure cloud • Timestamp • Cumulative forward flow volume • Cumulative reverse flow volume • Cumulative Net volume • Cumulative pump working hours • Meter serial number • Device last calibration date • Borewell id (Provided by CGWA)
Cloud	: The Communication / telemetry data should be directly captured in a secure cloud. The cloud service provider should be empaneled with The Ministry of Electronics and Information Technology (MeitY).
Transmission frequency	: The data shall be transmitted minimum 2 times in a day
Battery life	: In case of battery operated meters the battery shall run at least for a period of 3 years with 2 transmissions per day. The battery shall be replaceable without any data loss.
Data acquisition	: The meter shall be supplied with complete AMR / AMI system with Data Management software. The Data Management Software must be capable of running on a standard PC. The Data Management Software should be cloud based and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.
Real-time data to CGWA	: The un-tampered data from the secure cloud shall be sent to Central Ground Water Authority (CGWA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.

2. Installation of meter

Location	: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure. 1
Bypassing	: There shall be no bypassing of pipe prior to the installed flow meter.
Full flow	: The installation of the meter shall ensure the pipe shall have full of water at all times. Sufficient upstream and downstream straight length shall be provided for the meter (Refer to Figure 1.)

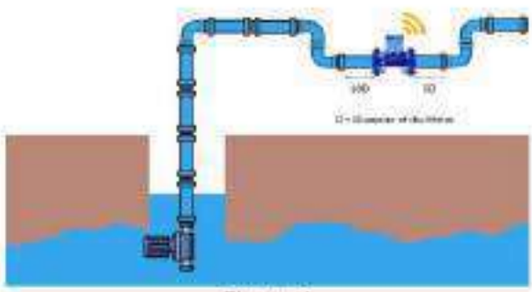


Figure. 1
Installation position of tamper proof flow meter with telemetry at groundwater abstraction structures.

3. DETAILED TECHNICAL SPECIFICATIONS OF AMR / AMI WATER FLOW METERS

3.1 Specification of flow meter

Flow meters shall meet the following metrological specification:

Turndown ratio of 10 or above
Accuracy ± 2%
Technology: electromagnetic or ultrasonic

3.1.1 Size:

1. DN40 - Flow range: 0.5 lps to 5 lps
2. DN100 - Flow range: 3 to 30 lps
3. DN150 - Flow range: 13 to 130 lps

Meter performance shall not get affected by external magnetic field, as specified in ISO4064.

Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.

3.1.2 Material of Construction:

The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per applicable standards (referred above).

- The water meter and accessories shall be manufactured from materials of adequate strength and durability.
- The body of the meter shall be of Brass/Bronze/MS/CI/SS/Engineering Plastic and compact enough to avoid tampering of meter. The manufacturer shall specifically mention in the offer, the material used in manufacturing.
- The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste, odor or discoloration in the water supply.
- The painting material used should be free from toxic constituents and safe for human uses and should not affect human health (Health Certificate should be attached/provided).
- Each meter should be supplied in separate individual box with its accessories, test/ calibration Certificate (for accuracy parameter) and Guarantee Card for free repair/replacement during the warranty period.

3.1.3 Markings on the Body of the Meter:

- Make/Brand, Size / Nominal Dia.
- Sl. No. / Year of Manufacture, Metrological specifications etc.

3.1.4 Meter indicator

The digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.

- It shall be of straight reading type
- No. of digits and verification scale interval shall be as sufficient enough to meet the required accuracy.
- Totalizer shall be made of suitable material required to maintain IP 68 protection class.

3.2 Telemetry System

- The AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering etc. along with necessary alarms.
- The system will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.
- The battery shall be replaceable without any data loss.
- The meters should report an alarm to the server as and when tampered.
- All Water Meter readings should be time stamped.
- The meter should have the capability to detect and record reverse flow separately.
- The meter should be capable of to detect Leak, Zero (No) Flow, High Flow.
- The AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The AMR/AMI should function even in the presence of high voltage power lines.
- Battery usage has to be indicated at the server. Provision should be provided to replace batteries if required.
- The communication shall be encrypted to avoid tampering.
- The meter should be configurable either using the DTU or from the server.
- Loss of communication should be indicated in the server within 48 hours.
- The meter should be able to log the daily flow data with a timestamp which is supposed to be sent to the cloud via telemetry for at least 2 years.
- In case the telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.
- This data shall also be used for retrieval in case of any dispute between meter data and online data.

3.3 Data Management Software

• The web based Data Management Software must be capable of running on a standard PC compatible with minimum Pentium Processor; in addition, the software must run under Windows XP Professional, Windows Vista, Windows 7 and / or latest version of Windows Operating System and HP Unix, Linux, Solaris, etc.

• The Data Management Software should be cloud base and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.
• The Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email/SMS to the user.

• The Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.
• The Data Management Software should be able to display all kind of data on screen at any time.
• The Data Management Software should have capability to add additional customer information and create customizable data fields.

3.4 Lab Testing / calibration:

Testing or Calibration of meters shall be performed at ISO 17025: 2017 accredited laboratory. The accuracy of meter shall be within ± 2 % in the operating range. The meter shall have valid model approval certificate.

The meter shall have model approval from India or abroad. Every meter should be calibrated / tested for accuracy in the operating flow range (10% to 100%). At least 4 point calibration at 10%, 40%, 70% and 100% of maximum/rated flow shall be performed.

Confederation of Indian Industry

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CII is a non-government, not-for-profit, industry-led and industry-managed organization, with over 9000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 294 national and regional sectoral industry bodies.

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WATER AUDIT REPORT

As per the guidelines of CGWA

MINISTRY OF JAL SHAKTI

At

Bajaj Energy Limited, Barkhera, Pilibhit, Uttar Pradesh

Prepared by

Confederation of Indian Industry
CII-Triveni Water Institute

April 2022

Water Audit Report
Bajaj Energy Limited, Barkhera, Pilibhit

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It is well worthy to mention that the efforts being taken, and the enthusiasm shown by all the personnel towards water conservation are really admirable.





Konala Kartik Reddy
Associate Counsellor & Head Advisory Services
Confederation of Indian Industry
CII-Triveni Water Institute

Abbreviations

MGF	Multi-Grade Filter
DMF	Dual Media Filter
UF	Ultrafiltration
RO	Reverse Osmosis
ERS	Effluent Recovery System
CGWA	Central Ground Water Authority
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
ETP	Effluent Treatment Plant
IMD	Indian Meteorological Department
LPCD	Liter Per Capita Per Day
RWH	Rainwater Harvesting
SAC	Strong Acid Cation (DM plant unit)
SBA	Strong Base Anion (DM plant unit)
STP	Sewage Treatment Plant
WTP	Water Treatment Plant

Executive Summary

Bajaj Energy Limited, Barkhera, Uttar Pradesh division is a coal based thermal power plant. It is situated in Pilibhit District of Uttar Pradesh. It is spread across an area of 27.65 acres including Plant, ETP, New Coal yard & Ash Dyke. There are 3 borewells installed inside the plant area. The wastewater generated in the plant is treated in the common effluent treatment plant. The treated effluent from this ETP is used for various activities like firefighting, ash handling, dust suppression and gardening. The specific water consumption for the plant is 2.93 m^3/MWh of power generated (FY 2021 - 2022).

Currently, the plant had a consent to withdraw 21,06,000 m^3/annum of water from 3 nos. borewells located within the plant area vide Application no. PLBH0621NIN0004, PLBH0621NIN0005 and PLBH0621NIN0006 valid up to 22/06/2026 from 3 borewells available inside the plant. At present, approximately 3661.46 m^3/day (average of from April 2021 – March 2022) of water is used for the plant operations. The plant has installed two piezometers with digital water level recorder and at four locations manual piezometers is used for water level monitoring inside the campus in compliance of the conditions mentioned in the NOC issued to them by Ground Water Department, Ministry of Jal Shakti, Government of Uttar Pradesh.

The plant has installed electromagnetic flow meters on all the three borewells. Electromagnetic Flowmeters have also been installed at other locations like Boiler Feed, RO Reject, ETP Outlet, domestic water consumption etc.

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 57.20% which puts Pilibhit district in the category of safe zone.

Given the above scenario of prevailing resource challenge, accelerating over time the management of Bajaj Energy Limited is very keen to do water audit of their premises. To get benefit of water saving projects, management of Bajaj Energy Limited awarded the task of water audit of its premises at Barkhera, Pilibhit district, Uttar Pradesh to CII Triveni Water Institute.

The audit is focused on improving water usage efficiency and identifying water conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by CII team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis.

Summary of Water Audit findings are presented in the following table shown below:

I	**Total Fresh Water Intake (Average)**	**3661.46 m^3/day**		
II	**Savings Achievable**	**101.6 m^3/day**		
	Water Saving Potential (%)	**2.77 %**		
Recommended Projects				
S. No	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	1.6	0.03	0.2
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	1.8	100
Observations				
1	Ash water flow meter was installed at inaccessible and non-readable height			
2	No smooth platform was present along the boundary of cooling tower sump to reclaim drifted water from the surface			

- Water balance across the plant has been successfully achieved. Total consumption- Bore well: 3661.46 m^3/day (average of April 2021 – March 2022)
- Strategies identified for reduction, reuse and recycle show:
  - Collection and Reuse of supernatant MGF backwash water after settling in a settling tank
  - Installation of RO plant for treatment of ETP treated effluent and reuse in cooling towers
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.
- Internal audits to be undertaken at BEL, Barkhera (every year); third party audits also recommended.

1. Introduction and background

1.1 Introduction

Water is a core element of natural capital, underpinning many business activities. Water risks cut across most industry sectors. As per the World Economic Forum Global Risks report, water crisis is the third most impactful global risks to business (WEF 2017). The risk continues to rise given the increasing demands and rising pressures. Safeguarding water and ensuring its availability in sufficient quantity and quality is therefore subject of vital interest to business.

Bajaj Energy Limited deals in generating coal-based power for UPPCL. They have an installed capacity of 2x45 MW power plant.

The present study focuses on BEL, Barkhera unit for water audit at the plant level that would help in identification of appropriate water management and conservative strategies to minimize the risks to operations.

The first step towards efficiently managing and conserving water resources is monitoring and mapping water consumption under various processes. This involves conducting a regular water audit that identifies and quantifies water uses and losses from a water system.

A comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions.

Good initiatives taken by the plant

- Monitoring system for flow by installation of electromagnetic flow meters at borewells and other strategic locations, mechanical flowmeters installed at other locations such as pump house, cooling tower blow down etc.
- No fresh water is used for horticulture.
- The ETP treated water is used in various applications like gardening, ash handling, dust suppression and firefighting.
- The ETP treated water is used for Firefighting in the entire plant.
- Rainwater harvesting pits have been constructed for recharge of ground water collected from paved road and sideways
- SWAS panel water is being collected and used as cooling tower makeup.

2. Scope

The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Barkhera, District Pilibhit.

Scope of work of the study includes the following:

- Study of water sources (size, capacity, quantity, quality)
- Existing water distribution system, associated losses, Wastewater discharge points across the process and Identification of water
- consumption of each existing meter/sub-meter
- Quantification of water distribution network in each section
- Mapping of raw water, process, recirculating water, cooling & domestic, recycling & effluents
- Segregation and collection of waste streams based on quality and quantity
- Study of various treatment & disposal schemes deployed in the plant
- Identification and Recommendations of projects based on reduce reuse & recycle on water Conservation
- On-site discussion with facility manager and personnel
- Monitoring and measurements using pressure and flow meters and various other devices as and when required
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Water system analysis and Quantification of baseline water map
- Developing Water consumption and wastewater generation pattern
- Evolving value added "cost of water" at various water use locations
- Identification of "branch flow unbalancing" at multi-cell cooling tower & associated losses in cooling tower efficiency & high drift losses
- Calculation of Rainwater Harvesting Potential for the site
- Estimating Specific water use and conservation potential
- Evolving recommendations/schemes for improvement in water and wastewater management system With Cost
- Recommendations for reduction in water consumption particularly in two conditions
    - Plant Stoppage Condition

  - Plant Running Condition
- Checking the compliances of all conditions/requirements as stipulated by government authority such as CGWA, MOEF etc.

3. Methodology of the Study

A team of two engineers were involved in carrying out the study. The study methodology involved the following steps:

- Preliminary discussions with plant personnel and observations in all water consuming areas
- Data collection through discussions, past records, specifications
- Identification of water conservation options on short, medium & long terms
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion, and submission of report to the management

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of portable instruments for carrying out various measurements and analyses. CII has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support water audit investigations and analyses. The specialized instruments that were used during the water audit include Ultrasonic water flow meter.

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

4. Assessment of Present Water Usage

4.1 Plant Water Consumption Trends

The source of water to the plant is borewell. Borewell water is majorly used for cooling and production applications after suitable treatment in water treatment plant. Borewell water is also utilized for domestic purposes. The figure below indicates the water consumption trend from April 2021 – March 2022. The uneven water consumption trend could be noticed because of the plant gets instructions from UPPCL for shutdown based on load requirements.

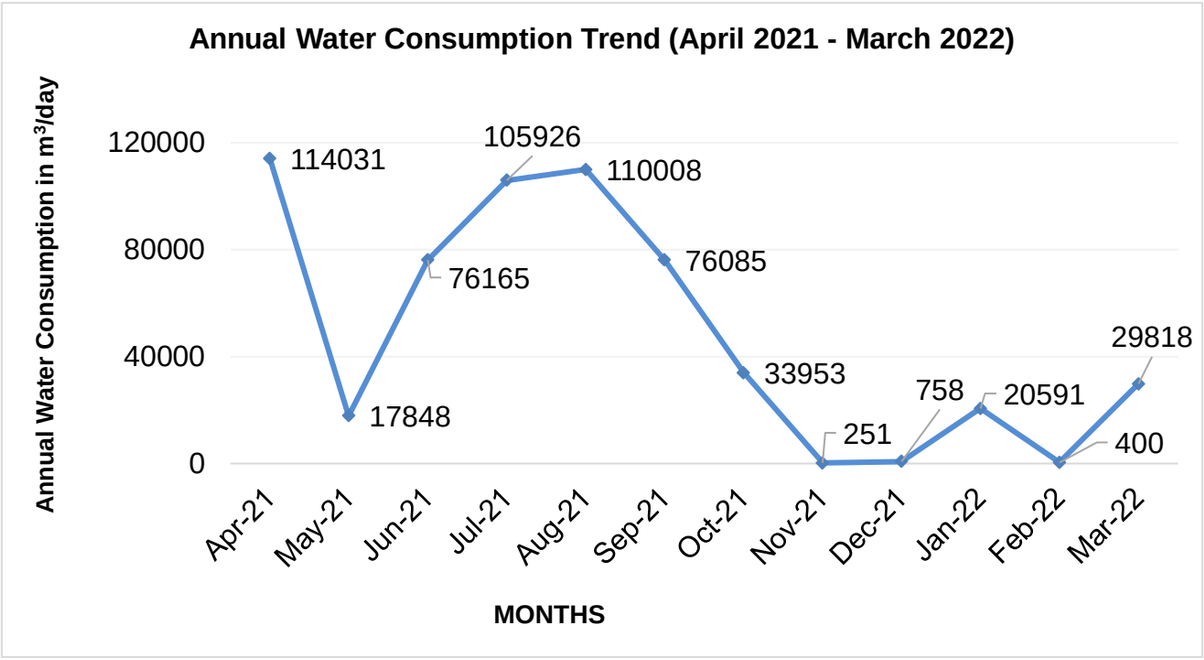


Figure 4.1: Water Consumption Trend April 2021 – March 2022

Specific Water Consumption

The specific water consumption is 2.93 m^3/MWh based on the data (April 2021 – March 2022) provided by the BEL, Barkhera team.

4.2 Water Sources

The source of water to the plant is borewells. The plant has 3 borewells within its premises. Raw water is majorly utilized for cooling tower makeup and producing DM water which is utilized for feed to the Boiler. The average daily water consumption through borewells is 3661.46 m^3/day (April 2021 - March 2022).

The total water consumption for past three calendar years is as follows:

Table 4.1 Water consumption trends for past 3 years

Year	FY 2019 - 2020	FY 2020 - 2021	FY 2021 - 2022
Water Consumption (m^3/year)	526861	281629	454450

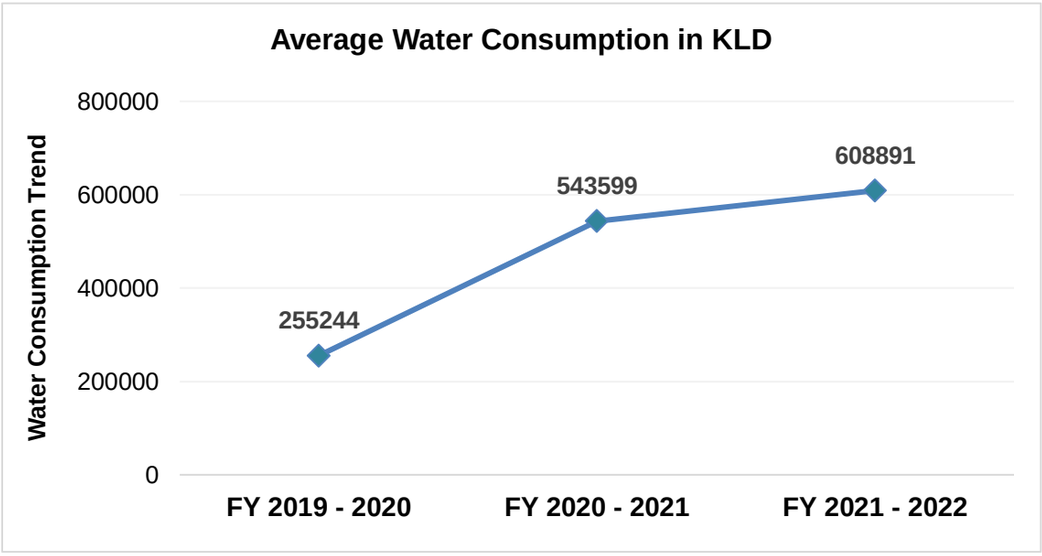


Figure 4.2: Water Consumption Trend for FY 2019 - 2022

The running hours of borewell range from 7-18 hours depending upon requirement.

The detailed description about the water source is provided below in the tabular form in table:

Table 4.2 Borewell Details

S.No.	Description	Depth (ft)	Pump H.P	Pumping capacity (m^3/h)
1	Borewell-1	110	25	180
2	Borewell-2	110	25	180
3	Borewell-3	110	25	180

Rainfall Pattern in last 5 years as per India - WRIS

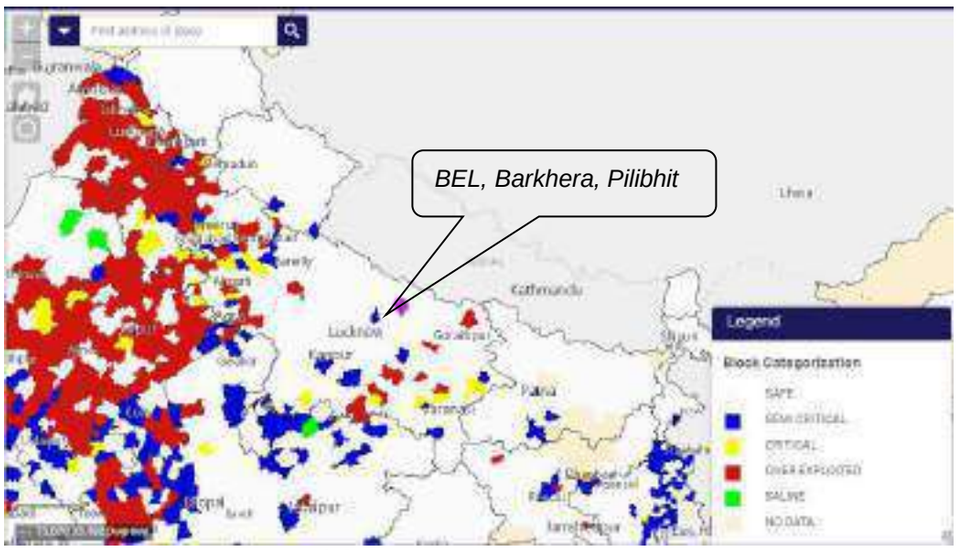
Total rainfall received at Pilibhit district, based on India - WRIS datasets shows that average rainfall is around 1215.85 mm. The rainfall varies between 971.81 mm to 1430.55 mm in last 5 years (2017 to 2021).

Table 4.3 Average annual rainfall (mm) in last 5 years as per India WRIS[1] data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	15.12	1.5	3.25	4.14	23.85	88.68	385.99	404.9	183.6	0.27	0	0.24	1111.54
2018	5.51	4.08	2.33	19.1	11.72	101.1	420.99	589.3	267.5	7.73	1.24	0	1430.55
2019	15	43.4	8.3	2.54	0.45	59.95	324.98	233.3	188.7	9.11	13.8	72.3	971.81
2020	103.45	22.3	61.7	24.2	59.91	205.7	413.46	299.6	74.11	0	0.85	0.01	1265.35
2021	4.37	2.3	0.07	4.53	146	239.4	364.8	238.5	67.12	232	0	0.71	1300
											Average Annual Rainfall		**1215.85**

Groundwater situation at the plant site

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 57.20% which puts Pilibhit district in the category of safe zone.

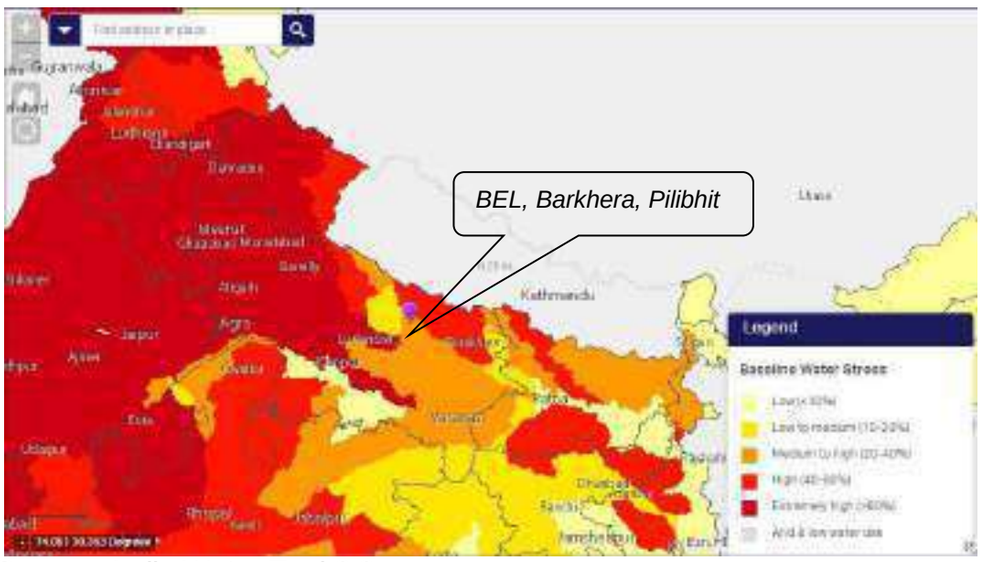


Source: India Water Tool 3.0

Figure 4.3 Groundwater Block Categorization of Barkhera, Pilibhit district

As per the India water tool the block lies in High (40-80%) baseline water stress zone. Higher value indicates that there is more competition among users related to water for domestic, industrial, agriculture and other purpose

[1] Source: India-WRIS (indiawris.gov.in)



Source: India Water Tool 3.0

Figure 4.4 Baseline Water Stress of Pilibhit District

4.3 Water Supply & Distribution Details

The water extracted from any of the 3 borewells is pumped through a common header line to the cooling towers, inlet to DM plant and for domestic water utilization. The major water consumer in the unit is the cooling tower.

For generation of DM water, the raw water from the borewells is first fed to a Multi Grade Filter (MGF) followed by a 2 stage RO system of 16 m^3/h (inlet) Capacity. The RO- permeate generated is fed to the DM plant which consists of Strong Acid Cation (SAC) followed by Strong base Anion (SBA) followed by Mixed Bed (MB). The reject from the RO and regeneration from the SAC, SBA & MB go to the N-pit. The DM water generated post MB is stored in 2 nos. DM water storage tanks of 150 m^3 and 200 m^3 (total DM water storage capacity 350 m^3) The DM water is used as feed to the boiler.

4.4 Water Balance

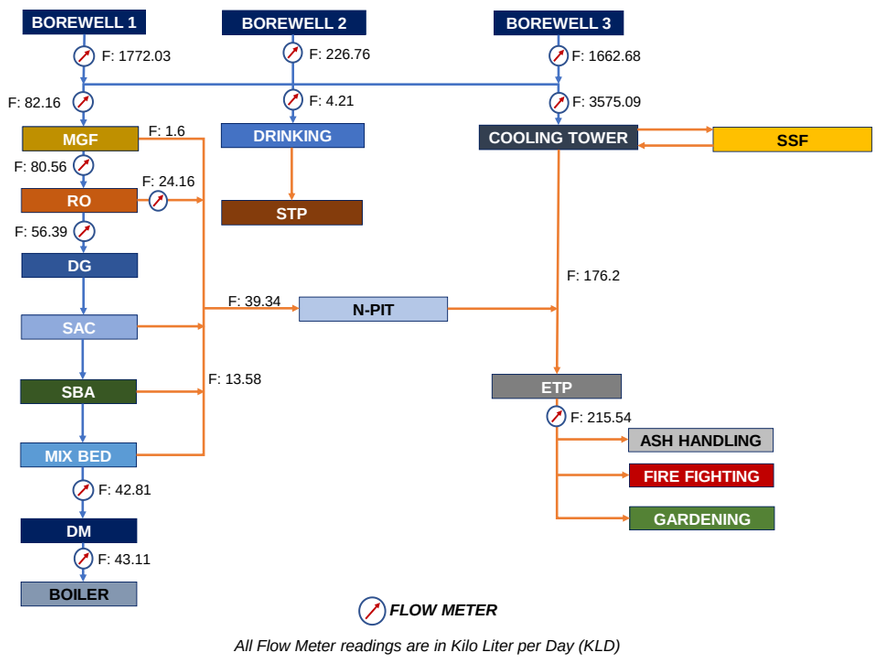


Figure 4.5 Water Distribution network diagram

NOTE: This balance has been prepared on average of the data from Financial Year 2021 - 2022

Overall plant water balance is shown below in tabular form in table 4.4

Table 4.4 Overall Water Balance (Daily Average)

Fresh water Balance			
S.No.	**Description**	**Quantity (KLD)**	**Remarks**
1	Inlet from Borewell 1	1772.03	FM reading
2	Inlet from Borewell 2	226.76	FM reading
3	Inlet from Borewell 3	1662.68	FM reading
	Total freshwater Inlet	**3661.46**	
Fresh water Distribution			
4	Inlet to DM Plant	82.16	FM reading
5	For Domestic Water Consumption	4.21	FM reading
6	As Cooling Tower Makeup	3575.09	Calculated value
	Total Fresh Water Distribution	**3661.46**	
DM Plant water balance			
7	Inlet to MGF	82.16	
8	MGF Backwash	1.6	
9	RO Inlet	80.56	
10	RO Reject	24.16	
11	Inlet to DM Plant SAC	68.34	
12	SAC, SBA & MB Regeneration	13.58	Calculated Value
13	DM water feed to Boiler	43.11	

4.5 Domestic water Consumption

Present domestic water consumption is 4.21 m^3/day (based on flowmeter readings). Domestic water consumption in the plant is accounted for applications like drinking, hand wash and toilet flushing.

The water supply and usage patterns were discussed with plant personnel and the observations are as follows:

- Separate meter is installed for measurement of domestic water consumption for the Plant.
- Water closets in plant are of western type with single flush type. However, the size of cisterns is large.
- Handwash taps in the plant are normal bib taps.
- Canteen is not present in the plant
- Total number of consumers (Permanent+ workers+ Visitors) = 210

- ❖ Water Consumption = 4.21 m^3/day
- ❖ Per capita Consumption = 20.04 LPCD

As per CGWA gazette notification, the recommended domestic water requirement is 30 LPCD

The domestic water consumption is well within limits as compared to the benchmark.

4.6 Rainwater Recharge & Harvesting

During the water audit study of the plant, it was found that plant is practicing the rainwater recharge by means both rooftop and paved area drainage through storm water drainage network.

Rainwater harvesting potential is the total amount of rainwater that can be harvested from a given site throughout the year. It can be calculated using the following formula:

Rainwater Harvesting Potential (KL) =
Catchment Area (sq.m.) x Average Annual Rainfall (m) x Run-off Coefficient

Average Annual Rainfall for Pilibhit = 1215.88 mm

The following table summarizes the total rainwater harvesting potential from the plant:

Table 4.5 Rainwater Recharge potential

Description	Area (m^2)	Runoff coefficient	Annual Rainfall (mm)	RWH Potential (KL)
Rooftop area (m^2)	4624	0.85	1215.85	4778.78
Paved Area (m^2)	20.24	0.65		16.00
Green Area (m^2)	33797.81	0.15		6163.96
Unpaved area (m^2)	73457.5	0.15		13397.00
Total				**24355.73**

It can be seen from the table above that there exists rainwater harvesting potential of 24355.73 KL throughout the plant.

4.7 Water Metering & Monitoring System

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of

monitoring. The presence and regular monitoring of flow meters ensures that the flows in the plant are well accounted. During the audit, the available flow meters were identified, and their working conditions were checked. The plant has installed flowmeters at various strategic locations, the flowmeter readings in comparison with ultrasonic flow meter readings have been detailed in the below given table.

Table 4.6 Comparative Water Flow Measurement

S. No	Metering Locations	BEL	CII	% Age Error
1	DM Inlet	15.8	16.4	3.66
2	Cooling Tower Blow Down	83.9	81	-3.58
3	RO1 Inlet	15.9	15.2	-4.61
4	RO1 Outlet	11.8	10.8	-9.26
5	RO1 Reject	4.2	4.4	4.55
6	RO2 Inlet	15.8	15.8	0
7	RO2 Outlet	11.8	11.3	-4.42
8	RO2 Reject	4	4.5	11.11
9	DM A Outlet	11.6	11.6	0.00
10	DM B Outlet	11.4	11.3	-0.88
11	SSF Common Header	189	187.7	-0.69
12	Potable Drinking Water	7.09	7.3	2.88

4.8 Water Costing

The cost of the different types of water is illustrated given below in table:

Table 4.7 Water Cost

S. No.	Description	Total Cost (Rs./m^3)
1	Borewell Water	5
2	DM Water Cost (as per ion exchange)	20.25

5. Water & Wastewater Treatment Practices

This section provides the detailed analysis of the data along with the key findings.

The effluent generated from the plant is treated in an Effluent Treatment Plant and the treated effluent is used for gardening, ash handling, dust suppression, firefighting etc.

Table 5.1 Wastewater Discharge Status (Daily Average)

S. No.	Description	Quantity (KLD)	Mode of Disposal
1	MGF Backwash	1.6	ETP
2	RO Reject	12.22	
3	SAC Regeneration	3.30	
4	SBA Regeneration		
5	MB Regeneration		

5.1 Raw/Fresh water Treatment

The water from all three borewells is supplied to the Water treatment plant. The treatment plants consist of MGF, and RO system followed by DM plant. Though they have installed softener, but at the time audit it was not operational and as per inputs from the plant team the softener is not being used at all. The water after passing to the RO system, goes to the DG, SAC, SBA and MB. The DM water generated post MB is stored in DM water storage tanks of 150 m^3 and 200 m^3. The wastewater from the MGF backwash, RO Reject, and DM plant regeneration is collected into the N-pit from where it is sent to the ETP plant for further treatment.

For cooling purpose, water is being fed through these three borewells into the cooling towers and its blowdown water is sent directly to the ETP after mixing with the N-pit discharge water. These borewells also meet the requirement for domestic purposes primarily for drinking purposes.

A schematic of the water treatment system inside the plant is shown below:

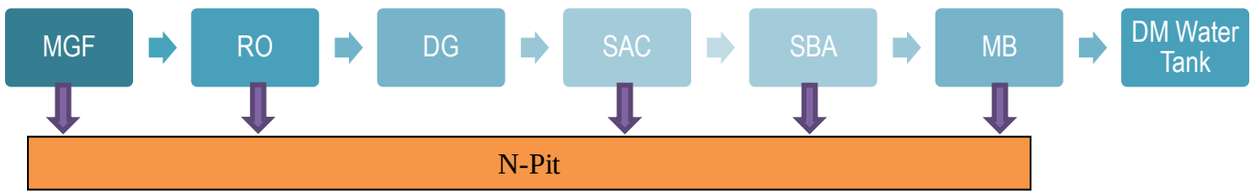


Figure 5.1: Schematic diagram of water treatment system

5.2 Waste Treatment & Disposal

The schematic of wastewater treatment and disposal is shown below

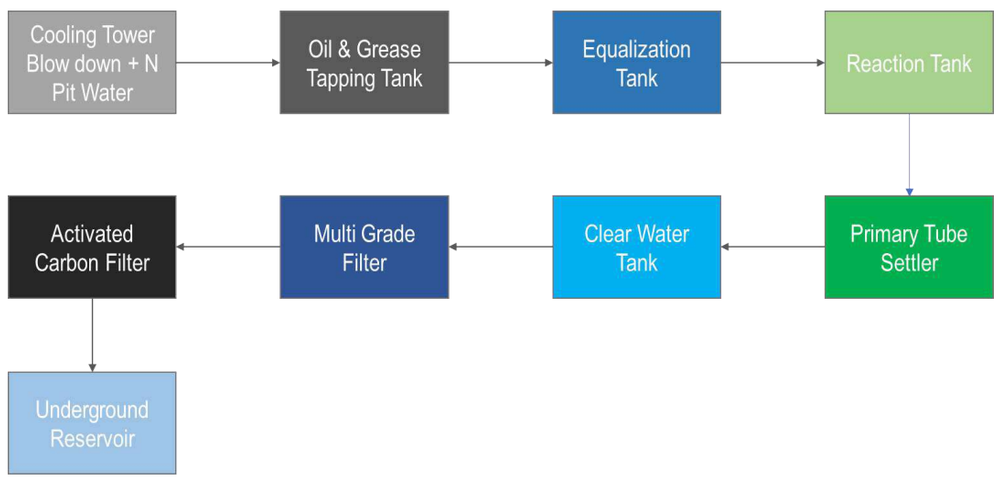
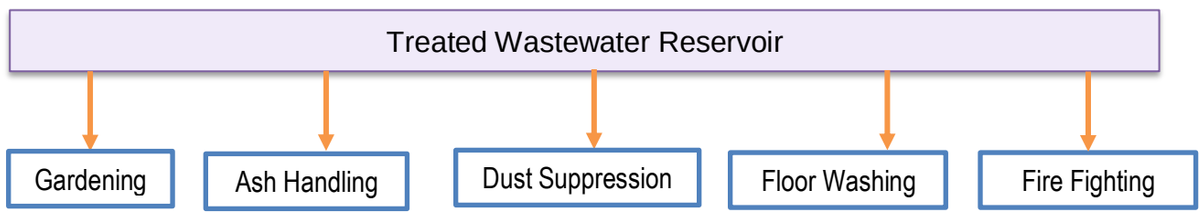


Figure 5.2 Schematic of Effluent Treatment plant

The treated water from the ETP is used for various secondary activities such as gardening, ash handling, dust suppression and floor washing.



5.3 Sewage Treatment

The plant has installed a Sewage treatment plant of 100 KLD capacity inside its township as reported by the plant team, the domestic wastewater is sent here for treatment.

5.4 Environmental Compliance related to Water

- BEL, Barkhera is currently extracting 3661.46 m^3/day (April 2021 – March 2022) against a permission of 7020 m^3/day as per the data provided by the plant team.
- Plant has installed Electromagnetic flow meters at all the 3 borewells and at remaining locations Electromagnetic/ mechanical flow meters have been installed.
- 02 nos. Piezometer with Digital water level recorder and at four locations manual piezometer is used for water level monitoring in the campus in compliance of the NOC conditions. The piezometers with DWLR support telemetry.
- As per the NOC issued by Ministry of Jal Shakti, Government of Uttar Pradesh the plant has to adopt rainwater harvesting/ recharge in the project premises. 2 nos. rainwater harvesting pits have also been constructed within the campus to collect rainwater from the paved roads and cemented sideways.
- Ground water quality is being regularly monitored through inhouse laboratory and the samples are also sent to NABL accredited lab for testing. The reports have been attached along in annexures.
- As per UPPCB Consent order, the domestic sewage generated within theplant premises should be treated in a sewage treatment plant. A sewage treatment plant of 100 KLD has been installed in the township and domestic wastewater is routed here for treatment as per the plant officials.

6. Water Conservation Opportunities

6.1 Water Saving Proposal 1: Reuse of filter backwash (MGF) water after settlement in a settling tank

6.1.1 Present Status

Presently the MGF backwash being generated from the Multi Grade Filter is being discharged into the common drain which goes to the N-pit.

The schematic of the present system is shown below:

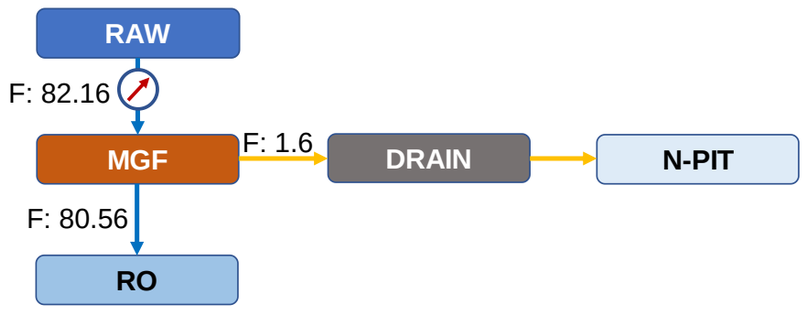


Figure 6.1: Schematic of present system of MGF Backwash

6.1.2 Recommendation

It is recommended to reuse the backwash water from the MGF and instead of sending it to the N-pit, the filter backwash should be stored in a settling tank to store water and allow for settlement of the supernatant particles. This backwash water does not have any impurities except for suspended particles and after settlement, the supernatant water quality will be equivalent to the raw water quality. The schematic of the proposed system is shown below:

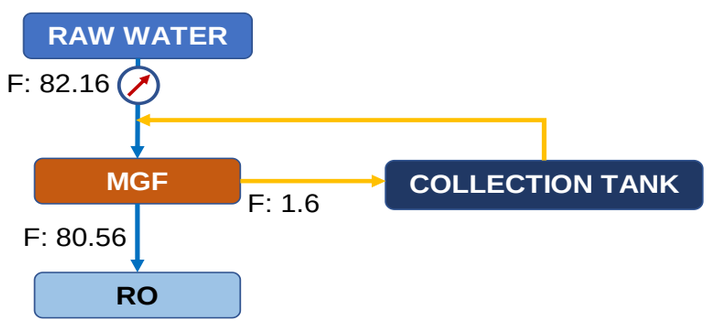


Figure 6.2: Schematic of proposed system of MGF Backwash

6.1.3 Benefits

The fresh water saving potential of about 1.6 m^3/day with cost benefit analysis as below.

Table 6.1 Cost – Benefits: Reuse of filter backwash (MGF) water after settlement in a settling tank

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 0.20/m^3**
Daily water savings	m^3/day	1.6
Annual water savings*	m^3/year	480
Annual cost Savings	Rs. Lakhs	0.02
Estimated cost (Approx.)	Rs. Lakhs	0.2
Payback Period	Year	10

*Calculated for 300 days

6.2 Water Saving Proposal 2: Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup

6.2.1 Present Status

Presently the ETP treated water is being used for low end applications such as Ash handling, Gardening, Coal yard dust suppression, sprinkling on road etc. This water has great potential to reduce the freshwater makeup to the cooling tower.

The water reaching the ETP comprises of mostly cooling tower blowdown and water from the N-pit which is a combination of DM plant regeneration and MGF backwash.

6.2.2 Recommendation

It is recommended to install a 3 stage RO system with MEE system to treat excess ETP treated water which presently is being used for gardening.

The capacity of the RO should be 105 KLD or approximately 10 KL/h considering 10 hours working. The overall recovery of the system will be 95% and the remaining 5% would get converted to salt through MEE.

6.2.3 Benefits

The fresh water saving potential of about 100 m^3/day with cost benefit analysis as below.

Table 6.2 Cost – Benefits: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 0.20/m^3**
Daily water savings	m^3/day	100
Annual water savings*	m^3/year	36500
Annual cost Savings	Rs. Lakhs	1.8
Estimated cost (Approx.)	Rs. Lakhs	100

*Calculated for 365 days

7. Implementation Plan

To better understand and comprehensively assess the water usage in the various processes and explore possibilities of water saving, Bajaj Energy Limited and CII- Water Institute partnered to undertake a detailed water audit of the plant.

The previous chapter detailed out the water saving proposals along with the key recommendations and, costs and benefits to the plant from their adoption. This chapter summarizes the key points emerging along with the way forward towards formulation of a Water Efficiency Plan.

The summary of total water savings emanating from proposed water saving proposals is shown in table 7.1.

Table 7.1 Water saving projects: summary for recommendations

I	**Total Fresh Water Intake (Average)**	**3661.46 m^3/day**		
II	**Savings Achievable**	**101.6 m^3/day**		
	Water Saving Potential (%)	**2.77 %**		
Recommended Projects				
S. No	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	1.6	0.02	0.2
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	1.8	100
Observations				
1	Ash water flow meter was installed at inaccessible and non-readable height			
2	No smooth platform was present along the boundary of cooling tower sump to reclaim drifted water from the surface			

7.1 Conclusions

7.1.1 Conclusion 1

Water balance across the plant has been successfully achieved
Total consumption: 3661.46 m^3/day (Daily Average)

7.1.2 Conclusion 2

Strategies identified for reduction, reuse and recycle show:

- Around 2.77 % saving can be achieved.
- Reduction in freshwater makeup for the cooling tower high potential to reduce overall groundwater withdrawal

7.1.3 Way Forward

❖ Prioritize projects

- Priority areas where immediate savings can be achieved include reuse of filter backwash water (MGF) after settlement in a settling tank.
- Installation of a RO system for treatment of ETP treated water has good potential to reduce the cooling tower freshwater makeup.
- Rainwater collection and harvesting is an important project and could be executed.
- Need to adopt schemes for water management and conservation (Recycle, Reuse and Reduce options)
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Monitor proposal-by-proposal

❖ Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.

❖ Internal audits to be undertaken at Bajaj Energy Limited units; third party audits also recommended.

Annexure I: Data Received from Plant Team

Water Consumption data

Water Consumption Data (April 2021 – March 2022)													
S. No.	**Description**	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**
1	Borewell – 1	57984	7901	29482	35317	48926	36379	21617	229	111	6764	0	9604
2	Borewell – 2	61963	11223	42842	55739	52106	29411	15549	45	0	8514	0	12504
3	Borewell – 3	0	0	11429	18325	15580	7136	4449	377	635	2492	486	3772

Steam Generation Data (April 2021 – March 2022)

S. No	Description	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
1	COC (month average)	5	5.84	5.82	6.52	5.7	6.21	5.8	shut down	shut down	4.06	shut down	4.59
2	Steam generation	158374	24182	112448	152564	165172	99882	56642	0	0	24440	0	30632

Piezometer Reading

DATE	TIME	WATER LEVEL (m)	
		GWR00132	GWR00135
31-12-2021	23:00:00	3.04	3.04
30-11-2021	23:00:00	2.94	2.94
31-10-2021	23:00:00	2.46	2.55
30-09-2021	23:00:00	2.93	2.82
31-08-2021	23:00:00	2.74	2.63
31-07-2021	23:00:00	2.68	2.57
30-06-2021	23:00:00	2.12	2.01
30-05-2021	16:00:00	2.31	2.56
30-04-2021	00:00:00	3.94	3.83
31-03-2021	00:00:00	3.87	3.76
28-02-2021	00:00:00	3.68	3.99
31-01-2021	13:00:00	4.29	3.89

Annexure II: Minimum Water Requirement

Annexure-2: Minimum Water Requirement
In view of the Gazette of India Notification Part II- Section 3 – Sub-section (ii) (CG-DL-E-24092020-221952, No. 2941), dated September 24, 2020, " All industries abstracting ground water in excess of 100 m3 /d shall be required to undertake annual water audit through Confederation of Indian Industry (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/PHDCCC certified auditors and submit audit reports within three months of completion of the same to CGWA".
An attempt was made to understand the minimum water required for regular plant operations.
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m3/MWH.
The specific water consumption for Bajaj Energy Limited, Barkhera, Pilibhit is 2.93 m3/MWh of power generated (Financial Year 2019 - 2021) Since the plant was running at less than the full load due to COVID-19 pandemic and coal shortage, approximately 3661.46 m3/day (average of April 2021 - March 2022) of water was being used for the plant operations.
The details of NOC for withdrawal of ground water are as under:

Water withdrawal permission as per CGWA NOC - BEL Barkhera				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
13	Application no. PLBH0621NIN0004	972000	KL/Annum	
14	Application no. PLBH0621NIN0005	756000	KL/Annum	
15	Application no. PLBH0621NIN0006	378000	KL/Annum	
16	Total water withdrawal NOC	2106000	KL/Annum	
E	**Permissible water withdrawal at 100% load**	7020	KL/day	**300 days working**
F	**Permissible water withdrawal at 70% load**	4914	KL/day	**300 days working**
Condition A: Plant working at 100% load condition				

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
1	Design recirculation rate	17200	m3/h	
2	Actual recirculation rate	**16104**		
3	COC	7		
4	Temperature difference	10		
5	Evaporation loss	5913	m3/day	
6	Drift Loss	77.3	m3/day	considering 0.02%
7	Blowdown	985.6	m3/day	
A	**Total makeup to the cooling circuit**	**6976.3**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
8	Total Staff Strength	160	Nos.	
9	Floating population	50	Nos.	
10	Recommended domestic water consumption	30	LPCD	
11	Total Domestic water consumption	6.3	m3/day	
12	Considering 15% extra	7.2	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**85**	**m3/day**	

D	**Total Minimum water requirement at 100 % load**	**7068.5**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
13	Cooling tower blowdown	985.6	**m3/day**	
14	Permeate recycled in cooling tower	591.3	**m3/day**	
15	Reject	394.2	**m3/day**	The reject will be used for dust suppression & ash quenching
16	New minimum water demand at 100% load	6477.2	**m3/day**	
17	Saving potential over NOC quantity	7.73%		

Case-2 : Saving potential with COC increased to 9				
18	COC	9		
19	Blowdown	739.2	**m3/day**	
20	Permeate recycled in cooling tower	443.5	**m3/day**	60% recovery
21	Reject	295.7	**m3/day**	The reject will be used for dust suppression & ash quenching
22	New minimum water demand at 100% load	6378.6	**m3/day**	
23	Saving potential over NOC quantity	9.14%		
Maximum saving possible at 100% load is 9.14% over NOC quantity				

Condition B: Plant working at 70% load condition

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
24	Design recirculation rate	17200	m3/h	
25	Actual recirculation rate	11438		
26	COC	7		
27	Temperature difference	10		
28	Evaporation loss	4200.0	m3/day	
29	Drift Loss	54.9	m3/day	considering 0.02%
30	Blowdown	700.0	m3/day	
A	**Total makeup to the cooling circuit**	**4954.9**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
31	Total Staff Strength	160	Nos.	
32	Floating population	50	Nos.	
33	Recommended domestic water consumption	30	LPCD	
34	Total Domestic water consumption	6.3	m3/day	
35	Considering 15% extra	7.2	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**85**	**m3/day**	

D	**Total Minimum water requirement**	**5047.2**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7

36	Cooling tower blowdown	700.0	**m3/day**	
37	Permeate recycled in cooling tower	420.0	**m3/day**	60% recovery
38	Reject	280.0	**m3/day**	The reject will be used for dust suppression & ash quenching
39	New minimum water demand at 100% load	4627.2	**m3/day**	
40	Saving potential over minimum water requirement	8.32%		Considering same COC
41	Saving potential over NOC quantity	5.84%		

Case-2 : Saving potential with COC increased to 9				
42	COC	9		
43	Blowdown	525.0	**m3/day**	
44	Permeate recycled in cooling tower	315.0	**m3/day**	
45	Reject	210.0	**m3/day**	The reject will be used for dust suppression & ash quenching
46	New minimum water demand at 100% load	4557.2	**m3/day**	
47	Saving potential over minimum water requirement	9.71%		Considering COC of 9
48	Saving potential over NOC quantity	7.26%		

Maximum saving possible at partial load is 7.26%

Annexure III: CGWA NOC

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICAT NO:

VALID UP TO : 22/06/2026

Name of the Applicant	ASHOK KUMAR MEHTA		
Address of the Applicant:	Bajaj Energy Ltd, Village-Barkhera, District - Pilibhit		
Company Name:	Bajaj Energy Limited	**Company Address**	Village- Barkhera, Tehsil-Bisalpur, Dist- Pilibhi
Serial No. of Application Form	PLBH0521NIN0004	**Date of Submission**	05/06/2021
Specimen Signature of the User:			
Location particulars:			
District	Pilibhit	**Block**	BISALPUR
Plot No.	N/A		
Municipality/Corporation	No	**Ward No.**	N/A
Holding No.			N/A
Rate of Withdrawal (m3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	01/11/2010
Particulars of the Proposed Well and Pumping Device:			
Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	24.00	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	30.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water:			972000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours I day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Place:

Date:

Yours Faithfully,
Signature of the Issuing Authority and Designation

1/3

Valid as Water Extraction Fee is Pending

6/23/2021 NOC Application Form

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICAT NO:

VALID UP TO : 22/06/2026

Name of the Applicant	ASHOK KUMAR MEHTA		
Address of the Applicant:	Bajaj Energy Ltd, Village-Barkhera, District - Pilibhit		
Company Name:	Bajaj Energy Limited	**Company Address**	Bajaj Energy Ltd, Village-Barkhera, District - Pil
Serial No. of Application Form	PLBH0621NIN0005	**Date of Submission**	05/06/2021
Specimen Signature of the User:			
Location particulars:			
District	Pilibhit	**Block**	BISALPUR
Plot No.	N/A		
Municipality/Corporation	No	**Ward No.**	N/A
Holding No.			N/A
Rate of Withdrawal (m3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	01/11/2010
Particulars of the Proposed Well and Pumping Device:			
Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	24.00	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	30.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours I day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Place:

Date:

Yours Faithfully,
Signature of the Issuing Authority
and Designation

1/3

Valid as Water Extraction Fee is Running

6/23/2021 NOC Application Form

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICAT NO:

VALID UP TO : 22/06/2026

Name of the Applicant	ASHOK KUMAR MEHTA		
Address of the Applicant:	Bajaj Energy Ltd, Village- Barkhera, District - Pilibhit		
Company Name:	Bajaj Energy Limited	**Company Address**	Village - Barkhera ,Tehil - Bisalpur ,Distt - Pilib
Serial No. of Application Form	PLBH0621NIN0006	**Date of Submission**	05/06/2021
Specimen Signature of the User:			
Location particulars:			
District	Pilibhit	**Block**	BISALPUR
Plot No.	N/A		
Municipality/Corporation	No	**Ward No.**	N/A
Holding No.			N/A
Rate of Withdrawal (m3/hr.)	180.00	**Date of Energization (in Case of Electric Pump)**	01/01/2021
Particulars of the Proposed Well and Pumping Device:			
Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	24.00	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	30.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:			378000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours I day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Place:

Date:

Yours Faithfully,
Signature of the Issuing Authority and Designation

Water as Water Extraction Fee is Pending

Annexure IV: Drinking water standard IS 10500 (2012)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 3.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

Annexure V: IS 1172: 1993 Code of Basic Requirements for water supply, drainage and sanitation

A general rule the following rates per capita per day may be considered minimum for domestic and non domestic needs:

1) For communities with population up to 20 000 and without flushing system

   a) water supply through standpost — 40 lphd (*Min*)

   b) water supply through home service connection — 70 to 100 lphd

2) For communities with population 20 000 to 100,000 together with full flushing system — 100 to 150 lphd

3) For communities with population above 100 000 together with full flushing system — 150 to 200 lphd

NOTE — The value of water supply given as 150 to 200 litres per head per day may be reduced to 135 litres per head per day for houses for Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions.

4.1.1 Out of the 150 to 200 litres per head per day, 45 litres per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

4.2 Water Supply for Buildings Other Than Residences

Minimum requirements for water supply for buildings other than residences shall be in accordance with Table 1.

Table 1 Water Requirements for Buildings Other than Residences

Sl No.	Type of Building	Consumption Per Day, litres
(1)	(2)	(3)
i)	Factories where bath rooms are required to be provided	45 per head
ii)	Factories where no bath rooms are required to be provided	30 per head
iii)	Hospital (including laundry) : a) Number of beds not exceeding 100	340 per head
	b) Number of beds exceeding 100	450 per head
iv)	Nurses' homes and medical quarters	135 per head
v)	Hostels	135 per head
vi)	Hotel	180 per head
vii)	Offices	45 per head
viii)	Restaurants	70 per seat
ix)	Cinemas, concert halls and theatres	15 per seat
x)	Schools: a) Day schools	45 per head
	b) Boarding schools	135 per head

NOTE — For fire demand in buildings refer IS 9668 : 1991.

5 DRAINAGE AND SANITATION REQUIREMENTS

5.1 General

There shall be at least one water tap and arrangements for drainage in the vicinity of each water-closet or group of water-closets in all buildings.

5.2 Residences

5.2.1 Dwellings with individual conveniences shall have at least the following fitments:

a) One bath room provided with a tap,

b) One water-closet, and

c) One nahani or sink either in the floor or raised from the floor with a tap.

Where only one water-closet is provided in a dwelling, the bath and water-closet shall be separately accommodated.

NOTE — Water-closets, unless otherwise indicated, shall be of Indian style (squatting type).

5.2.2 Dwellings without individual conveniences shall have the following fitments:

a) One water tap with draining arrangement in each tenement,

b) One water-closet and one bath for every two tenements, and

c) Water taps in common bath rooms.

5.3 Buildings Other Than Residences

The requirements for fitments for drainage and sanitation in case of buildings other than residences shall be in accordance with Tables 2 to 12.

6 WATER SUPPLY, DRAINAGE AND SANITATION REQUIREMENTS FOR RAILWAY PLATFORMS, BUS STATIONS, BUS TERMINALS AND AIRPORTS

6.1 General

The water supply, drainage and sanitation requirement specified in 6.2 to 6.4 for railway stations, bus stations, bus terminals, sea ports

Annexure VI: Borewell & ETP Quality test reports

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ground Water	W-021021-05	07/10/2021

Issued To : M/s Bajaj Energy Ltd.
Village Barkhera Kalan, District- Pilibhit (U.P)- 262201 India

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Drawn On	:	02/10/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	02/10/2021 to 07/10/2021
Sampling Location	:	Bore well Water – Coal Yard (Towards cane carrier)
Sample Description	:	Ground Water

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.58	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	560	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0

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6.	Calcium (as Ca)	IS: 3025 (P- 40)	70.0	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	135.0	mg/l	250	1000
9.	Copper (as Cu)	IS: 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.38	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.171	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	17.0	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	7.0	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	45.0	mg/l	200	400
20.	Sulphide (as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	200	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	245	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	0.22	mg/l	5.0	15
24.	Phenolic Compound as (C_6H_5OH)	IS: 3025 (P- 43)	BDL	mg/l	0.001	0.002

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

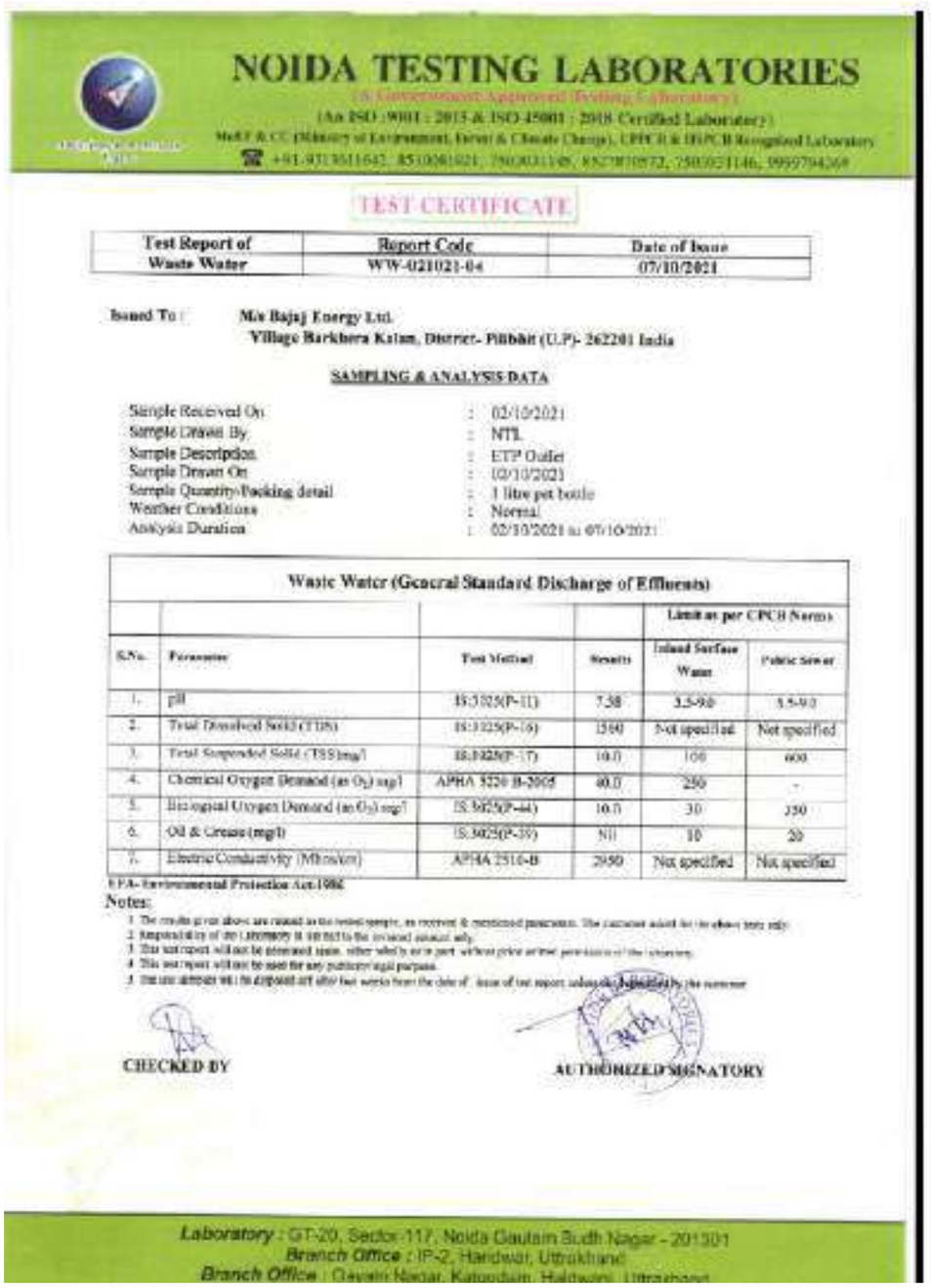
BDL: Below Detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless otherwise specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-021021-04	07/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Village Barkhera Kalan, District- Pilibhit (U.P)- 262201 India

SAMPLING & ANALYSIS DATA

Sample Received On : 02/10/2021
Sample Drawn By : NTL
Sample Description : ETP Outlet
Sample Drawn On : 02/10/2021
Sample Quantity/Packing detail : 1 litre pet bottle
Weather Conditions : Normal
Analysis Duration : 02/10/2021 to 07/10/2021

Waste Water (General Standard Discharge of Effluents)

S.No.	Parameter	Test Method	Results	Limits as per CPCB Norms	
				Inland Surface Water	Public Sewer
1.	pH	IS:3025(P-11)	7.38	5.5-9.0	5.5-9.0
2.	Total Dissolved Solid (TDS)	IS:3025(P-16)	1560	Not specified	Not specified
3.	Total Suspended Solid (TSS)mg/l	IS:3025(P-17)	10.0	100	600
4.	Chemical Oxygen Demand (as O_2) mg/l	APHA 5220 B-2005	40.0	250	-
5.	Biological Oxygen Demand (as O_2) mg/l	IS 3025(P-44)	10.0	30	350
6.	Oil & Grease (mg/l)	IS:3025(P-39)	Nil	10	20
7.	Electric Conductivity (Micro/cm)	APHA 2510-B	2950	Not specified	Not specified

EPA- Environmental Protection Act,1986

Notes:

1. The results given above are related to the tested samples, as received & mentioned parameters. The customer asked for the above tests only.
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Branch Office : Gayatri Nagar, Kotdwara, Haldwani, Uttrakhand

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-021021-03	07/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Village Barkhera Kalan. District- Pilibhit (U.P)- 262201 India

SAMPLING & ANALYSIS DATA

Sample Received On	:	02/10/2021
Sample Drawn By	:	NTL
Sample Description	:	ETP Inlet
Sample Drawn On	:	02/10/2021
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	02/10/2021 to 07/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.23	-
2.	Total Dissolved Solid (TDS)	IS:3025(Part-16):1984	2250.0	mg/l
3.	Total Suspended Solid (TSS)	IS:3025(Part 17):1984	125.0	mg/l
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	146.0	mg/l
5.	Biological Oxygen Demand (as O_2) (3 days at 27^{0C})	IS:3025(Part-44):1993	58.0	mg/l
6.	Oil & grease	IS:3025(Part-39):1984	NEI	mg/l
7.	Electric Conductivity (Mhos/cm)	APHA 2510-B	3098	Mhos/cm

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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Annexure VII: Water Saving Gadgets

Electronic Taps (e-taps)

The latest trend in industries is to install electronic taps (e-taps). The advantages of using e-taps are as mentioned below:

- Unlike conventional taps, there is no twisting or turning in e-taps. They have a sensor, which cuts off water supply completely when not in use. This helps in saving up to 70% water during hand wash

- E-taps enable hands free operation. No fear of cross contamination or contact with germs. E-taps score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.

- E-taps can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.

- The touch free electronic taps, available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Operation of Electronic Taps

This has been successfully implemented in several hotels & restaurants. Of late, several industries have also started implementing this proposal.

Thus, there is a good potential to optimize the freshwater consumption by replacing the existing taps with e-taps.

Electronic flush (e-flush) urinals

The latest trend in industries is to install e-flush urinals. The advantages of using e-flush urinals are as mentioned below:

- E-flush urinals are fitted with a sensor, which senses the usage and flush with water for few seconds after use. This helps in saving 70% water during urinal flush
- E-flush urinals enable hands free operation and score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.
- E-flush urinals can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.
- The touch free e-flush urinals available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Photographs: Electronic flush urinals

Waterless urinals

Waterless urinals eliminate 100% water usage in urinal flush. The concept is based on blue seal technology. The patented blue seal density is lesser than urine and hence allows the passage of urine and acts as a protective layer. The blue seal also eliminates odour emanating from urine. The blue seal is bio-degradable and has to be replaced once in 5000-7000 usages.






Photographs: waterless urinals

Hand wash
NEERR nozzles

Demonstration conducted at a site showed a water saving of 92.18% in the mist mode, 85% in the foam mode and 60% with the normal aerator nozzle.



Photographs: Basic Aerator, NEERR nozzle: Foam Mode and NEERR nozzle: Mist Mode

Thus, 85% water saving can be assumed though installation of these NEERR nozzles.

Technical details about the product: NEERR[2] nozzles are based on water A.R.T. (Atomizer Reduction Technology)[3], which atomizes the water and creates a heavy mist, hence reducing the consumption in any washing application by up to 95%. There are two modes available in the same nozzle:

Mist Mode: Saves up-to 95% water (at 3 bar pressure). It is perfect for daily utility activities like brushing, washing dishes etc.

Normal Mode: With a twist, Neerr switches to normal mode, which still saves up to 75% water (at 3 bar pressure). It is more useful while filling glasses, pots etc.

Installation: Retrofits into the existing tap**;** Unscrew the existing aerator and insert the Neerr Nozzle.

Dimensions: Fits Standard (20.8 mm), Junior (18.1 mm) and Tom Thumb (15 mm) sized taps (inner socket dimension)

Material: Lead Free Brass (Chromed Handles)

Water Pressure: 1.2 – 8bar. (Suitable for low pressure water systems).

Water Temperature: Max 192 degree F / 89 degree C

[2] NEERR^{TM} is a product innovated by ZeFi Labs with RETAS as Marketing Partner
[3]It is a patent pending technology by ZeFi Labs

Foam taps

Conventional taps are used in the hand wash areas which results in large quantity of fresh water. Foam taps are a better fit in these high consumption areas. They consume 25-30% less than the conventional taps.



Photographs: Foam taps

Spring loaded Push taps

Spring loaded push type tap is an alternate device for minimizing hand wash Water. The spring-loaded push taps operate with the simple mechanism of pressing the knob for water. The knob automatically released back to close position in 5-7 seconds. This saves about 30-40% of water compared to the conventional taps



Photographs: Spring loaded push taps

Low flush cistern

The latest model closets are water efficient and operate in dual mode with single flush releases 2 liters and dual flush releases 4 liters per flush. This results in large quantity of water savings.



Photographs: Low flush cisterns

Annexure VIII: Suggestive List of Vendors for providing water saving equipment/technology/consultancy

a. Supplier Addresses of Water & Wastewater Treatment Systems and Water Saving Devices

1. Hitech Enviro Engineers & Consultants Pvt. Ltd.
Address: Plot No : A-1, Ground Floor,
Kaushambi, Ghaziabad – 201010
Tel: 0120– 4294461-63,
Fax: 0120- 4294462
Email: projects@heecpl.com
Website: www.heecpl.com
Contact Person: Mr. Hitesh Mittal (Director)

2. Arvind Envisol Ltd.,
Address: Naroda Road, Ahmedabad,
Gujarat-380025
Tel: 079 30138000
Fax: 079 30138677
Email: ashini.shah@arvind.in
Website: www.arvind.com
Contact Person: Mr Ashini Shah

3. GE India Industrial Pvt. Ltd
Address: Building No 7A, 5th Floor DLF Cyber City,
DLF Phase III, Sector 25A, Gurgaon
Haryana – 122002
Tel: 0124 4808016
Mobile: 09999907981
Email: himanshu.gupta@ge.com
Contact Person: Mr Himanshu Gupta

4. Genesis Membrane Sepratech Pvt. Ltd
Address: No18, Vardhaman Complex
No 10, L.B.S Marg, Vikhroli (West)
Mumbai – 400 083
Tel: 022-5775456 / 5775458
Fax: 022-5790608
Mobile: 9322229520
Email: genesis@bom5.vsnl.net.in
Contact Person: Dr BibhashChakravorty

5. Ion Exchange India Ltd
Address: Block B, Flat No.8, Local Shopping Center
Ring Road, NarainaVihar
New Delhi - 110 028
Tel: 011 2577 1160/0862/6061/6065
Fax: 011 2577 4837
Email:delcro@ionexchange.co.in

6. Jindal Water Infrastructure Ltd
Address: Jindal ITF Centre, 28 ShivajiMarg, New Delhi 110015
Telephone: 011-45021983, 45021984
Fax: 011-45021982
Email: info@jindalaquasource.com
Website: www.jindalaquasource.com
Contact Person: Mr SudhirMalhotra, Sr Vice President

7. Doshi Ion Exchange & Chemical Industries Limited
Address: C – 147, Madhuban
Near Universal Public School
New Delhi 110092, India
Tel: +91-11-22502064 / 22022175
Fax: +91-11-22044979
Email: delhi@doshion.com

8. Max Pure Water Systems
Address: Near Bharat Petrol Pump,
Opposite Bharat Cancer Hospital,
Kumbharia Road, Saroli, Surat. Gujarat
Telephone: 0261-264 3894
Fax: 0261-264 0034
Mobile: 98980 43960, 98980 41900
E-mail: maxpurero@gmail.com; info@maxpurero.com
Website: www.maxpurero.com
Contact Person: Mr. Kailash Shah, Director

9. Chempure Technologies Pvt Ltd
Address: 28/1, Manjolai 2nd Main Road
Kalaimagal Nagar Extn., Ekkaduthangal
Chennai – 600097
Tel: 044-22250173 / 22250162
Fax: 044-22250867
Mobile: 9444076114
Email: chempure@vsnl.net
Contact Person: Mr Leo Vino

10. **Pentair Water India**
    Address: L/52-55, Verna Industrial Estate
    Verna, Salcette
    Goa – 403 722
    Tel: 0832-2883300
    Fax: 0832-2883312
    Contact Person: Mr MritunjayChaubey

11. **Nuchem Weir India Limited**
    Address: E-46/12, Okhla Industrial Area,
    Phase - II , New Delhi - 110 020
    Tel: 26385737, 26383234, 26384656
    Fax: 51611846
    Manager-Water Treatment
    Email: msakhtar@nuchemweir.com
    Contact Person: Mr M.S.Akhtar

b. Flow Meters (Fixed/Portable)

1. **Forbes Marshall Pvt. Ltd.**
   Address: A-34/35, MIDC, H Block,
   Pimpri, Pune-411018, Maharashtra
   Telephone: 020-2744 2020
   Fax: 020-2744 2420, 2040
   Mobile: 98505 67714
   E-mail: rmishra@forbesmarshall.com
   Website: www.forbesmarshall.com
   Contact Person: Mr Rakesh Mishra,
   Head - Water Business

2. **Iota Flow Systems Pvt Ltd**
   Address: A-2/13 Phase II ,Industries Area,
   Maya Puri, New Delhi - 1100 064
   Tel.: 91-11-46254601-08 Extn 17
   Moblie: 09958609393
   Fax: 91-11-46880020
   Email: sunil@iotaflow.com
   Contact Person: Mr Sunil Yadav

3. **GE India Industrial Pvt. Ltd**
   Address: Building No 7A, 5th Floor DLF Cyber City,
   DLF Phase III, Sector 25A, Gurgaon
   Haryana – 122002
   Tel: 0124 4808016
   Email: Srikanth.Kommu@ge.com

Contact Person: Mr Srikanth Kommu

4. **Rockwin Flowmeter India Pvt Limited**
   Address: B-24, Site IV,
   Sahibabad Industrial Area,
   Ghazibad-201010, Uttarpradesh
   Tel: 0120-2895400, 2896286, 2895079
   Fax: 0120-2895450
   Mobile: 9810129687, 9331052312, 9381026604
   E-mail: rajiv@rockwin.com; Mumbai@rockwin.com; rockwinkolkata@vsnl.net; rockwinchennai@vsnl.net
   Website: www.rockwin.com
   Contact Person : Mr Rajiv Prakash

5. **Orbit Technologies Pvt. Ltd.,**
   Address: B-50, Sanathnagar Industrial Area,
   Hyderabad-500018
   Ph: 040-67216354
   Fax: 040-23801579
   Email : orbit@orbitindia.com
   Website :www.orbitindia.com

c. Water Saving Gadgets (e-flush, e-taps, Foam taps, dual flush cisterns & low flow showers)

1. **Hindustan Sanitary ware & Industries Ltd.**
   Address: Tewari House, 2nd Floor, 11 - B / 8
   Main Pusa Road, New Delhi - 110005
   Tele Phone: 011 - 2585 4656
   E-mail: nitinkulkarni@hindware.co.in
   Contact Person: Mr. Nitin Kulkarni, Head,
   Institutional Sale & Business Development

2. **Jaguar & Company Limited**
   Address: 306, Udyog Vihar,
   Phase-II, Gurgaon (INDIA)
   Hand Phone: 098110 23782
   E-mail: bandu@jaguar.com
   Contact Person: Mr.Bandhu,
   Asst. Manager Production

3. **Kohler India**
   Tele Phone : 0124 - 4319 685 / 86
   E-mail : indiacustomercare@kohler.com

4. Parryware Roca Pvt. Ltd.
Address: 234, N.S.C. Bose Road,
Dare House, 4th Floor, Chennai -600 001
Tele Phone: 044 - 25306341
Hand Phone: 98401 00544
Fax: 044 - 25340034
E-mail: muralit@parry.murugappa.com
Website: www.parrywareroca.com
Contact Person: Mr. T.Murali,
Area Head (Institutional Sales)

5. Viega International - GEM Sanitary Appliances Pvt. Ltd.
Address: A-57, Wazirpur Industrial Area, Delhi - 110 052
Tele Phone: 011 - 2737 7802 / 03 / 05
Hand Phone: 098101 56083
Fax: 011 - 2737 7806
E-mail: gemsanitary@vsnl.com
Contact Person: Mr. C.S. Gupta

6. BVG Falcon
Address: Hyderabad
Tele Phone: 040 - 2309 5499
Hand Phone: 98480 55507
Contact Person: Mr.Goel, Director
Head Institutional Sale & Business Development

d. Cooling Tower Equipments:

1. Kemco Technologies India Private Limited
Suite 906, Surya Kiran,
19 Kasturba Gandhi Marg,
New Delhi 110001, India
Tel: +91 11 4151 1177
Fax: +91 11 4151 8989
Mobile: +91 9364204800
Email: junsodsod@kemcosc.com

2. Raj Heat Exchangers & Cooling Towers
Address: 190-1/4, Sai Nagar,
Sidco Industrial Estate (P.O.),
Coimbatore-641021, Tamil Nadu
Telephone: 0422-2672615, 2672592
Mobile: 9443820160
E-mail: info@rajheat.com
Website: www.rajheat.com

Contact Person: Mr Nagarajana

3. **Sanosil Biotech Pvt. Ltd.**
   Address: Warden House, Sir P M Road, Fort, Mumbai-400001
   Telephone: 022-2287 2295
   Fax: 022-2287 3475
   E-mail: info@sanosilbiotech.com
   Website: www.sanosilbiotech.com

4. **Aquazone Systems & Engineering**
   Address: 1, Yash Plaza,
   25 Archna Industrial Estate,
   B/h. Nilkanth Hotel, Opp. Bharat
   Bobbins, 132 Ft. Ring Road,
   Ajit Mill, Rakhial,
   Ahmedabad-380023, Gujarat
   Telephone: 079-2909 2182
   Fax: 079-2909 2182
   Mobile: 98242 65617, 94277 02867
   E-mail: ozone@ozoneworld.com;
   ozonators@rediffmail.com;
   ozoneworld@gmail.com
   Website: www.ozoneworld.com

5. **Mm Aqua Technologies Ltd**
   Address: Behrampur Road, Khandsa,
   Gurgaon-122001, Haryana
   Telephone: 0124-221 4134
   Fax: 0124-426 5020
   E-mail: info@mmaqua.com
   Website: www.mmaqua.com
   Contact Person: Mr Santanu Paul, Manager

6. **Ozonetek Limited**
   Address: 30 Landons Road,
   Chennai-600010
   Telephone: 044-2641 4717, 18, 19
   Fax: 044-26414720
   E-mail: info@ozonetek.com; ozonetek@vsnl.com; support@ozonetek.com;
   kpatel@ozonetek.com
   Website: www.ozonetek.com
   Contact Person: Mr Dr K. Patel, Managing Director

7. **Cook Deck Aqua Solutions Pvt. Ltd.**
   Address: 121, Andheri Industrial Premises,
   Off Veera Desai Road, Andheri West,
   Mumbai-400053, Maharashtra
   Telephone: 022-6725 1401,
   2850 3670, 2850 5767
   Fax: 022-2673 1820
   Mobile: 98960 11623, 98201 06694
   E-mail: kpgwalani@cooldeckin.com;
   harsh@cooldeckin.com;marketing@cooldeckin.com
   Website: www.cooldeckin.com
   Contact Person: Mr K P Gwalani, Proprietor
   Mr Harsh Bhargava, Director

8. **Adwyn Chemicals Pvt. Ltd.**
   Address: 154-A, Pocket-1, Mayur Vihar, Phase-1, Delhi-110091
   Telephone: 011-2279 3281, 2275 7974
   Fax: 011-2275 7974, 2275 3765
   Mobile: 98101 74794
   E-mail: adwynchemicals@yahoo.co.in; adwyn@vsnl.com
   Contact Person: Mr Aditya Gupta, Director

Annexure IX: Guidelines for installation of Flow meter on Borewells

Digital Water Flow Meter with Telemetry for Groundwater extraction monitoring as per CGWA notification

Technical specifications

1. Specification of Tamper proof Electronic water meter with telemetry

Metering Technology	: Ultrasonic or Electromagnetic
Communication type	: LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G)
Tamper proof:	
a) Power source	: The meter shall be battery operated or UPS powered supply with provision of power OFF detection. The telemetry system units shall be battery operated or through external power supply. The metering data should be stored in the meter even if the telemetry system is off due to power failure.
b) Sealing	: The meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
Compliance	: The meter shall preferably be manufactured as per ISO 4064: 2014 Standards and shall have IP 68 ingress protection.
Accuracy	: The meter shall be of accuracy better than ± 2% for the operating flow range (from 10 % to 100 % of maximum flow rate).
Test certificate	: The meter manufacturer shall submit the latest test/calibration certificate of the meter, from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL) or any third party laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), for every meter.
Parameters to monitor	: The meter (since installation of the requisite water meter) shall transmit the following parameters to a

	secure cloud • Timestamp • Cumulative forward flow volume • Cumulative reverse flow volume • Cumulative Net volume • Cumulative pump working hours • Meter serial number • Device last calibration date • Borewell id (Provided by CGWA)
Cloud	: The Communication / telemetry data should be directly captured in a secure cloud. The cloud service provider should be empaneled with The Ministry of Electronics and Information Technology (MeitY).
Transmission frequency	: The data shall be transmitted minimum 2 times in a day
Battery life	: In case of battery operated meters the battery shall run at least for a period of 3 years with 2 transmissions per day. The battery shall be replaceable without any data loss.
Data acquisition	: The meter shall be supplied with complete AMR / AMI system with Data Management software. The Data Management Software must be capable of running on a standard PC. The Data Management Software should be cloud based and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.
Real-time data to CGWA	: The un-tampered data from the secure cloud shall be sent to Central Ground Water Authority (CGWA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.

2. Installation of meter

Location	: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure. 1
Bypassing	: There shall be no bypassing of pipe prior to the installed flow meter.
Full flow	: The installation of the meter shall ensure the pipe shall have full of water at all times. Sufficient upstream and downstream straight length shall be provided for the meter (Refer to Figure 1.)

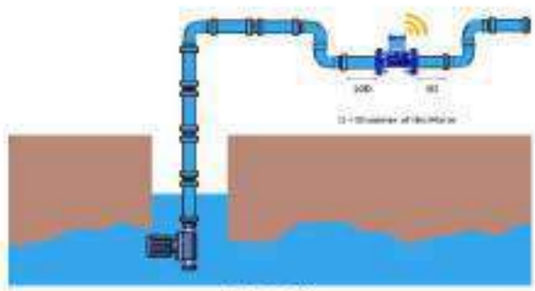


Figure. 1
Installation position of tamper proof flow meter with telemetry at groundwater abstraction structures.

3. DETAILED TECHNICAL SPECIFICATIONS OF AMR / AMI WATER FLOW METERS

3.1 Specification of flow meter

Flow meters shall meet the following metrological specification:

Turndown ratio of 10 or above
Accuracy ± 2%
Technology: electromagnetic or ultrasonic

3.1.1 Size:

1. DN40 - Flow range: 0.5 lps to 5 lps
2. DN100 - Flow range: 3 to 30 lps
3. DN150 - Flow range: 13 to 130 lps

Meter performance shall not get affected by external magnetic field, as specified in ISO4064.

Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.

3.1.2 Material of Construction:

The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per applicable standards (referred above).

- The water meter and accessories shall be manufactured from materials of adequate strength and durability.
- The body of the meter shall be of Brass/Bronze/MS/CI/SS/Engineering Plastic and compact enough to avoid tampering of meter. The manufacturer shall specifically mention in the offer, the material used in manufacturing.
- The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste, odor or discoloration in the water supply.
- The painting material used should be free from toxic constituents and safe for human uses and should not affect human health (Health Certificate should be attached/provided).
- Each meter should be supplied in separate individual box with its accessories, test/ calibration Certificate (for accuracy parameter) and Guarantee Card for free repair/replacement during the warranty period.

3.1.3 Markings on the Body of the Meter:

- Make/Brand, Size / Nominal Dia.
- Sl. No. / Year of Manufacture, Metrological specifications etc.

3.1.4 Meter indicator

The digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.

- It shall be of straight reading type.
- No. of digits and verification scale interval shall be as sufficient enough to meet the required accuracy.
- Totalizer shall be made of suitable material required to maintain IP 68 protection class.

3.2 Telemetry System

- The AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering etc, along with necessary alarms.
- The system will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.
- The battery shall be replaceable without any data loss.
- The meters should report an alarm to the server as and when tampered.
- All Water Meter readings should be time stamped.
- The meter should have the capability to detect and record reverse flow separately.
- The meter should be capable of to detect Leak, Zero (No) Flow, High Flow.
- The AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The AMR/AMI should function even in the presence of high voltage power lines.
- Battery usage has to be indicated at the server. Provision should be provided to replace batteries if required.
- The communication shall be encrypted to avoid tampering.
- The meter should be configurable either using the DTU or from the server.
- Loss of communication should be indicated in the server within 48 hours.
- The meter should be able to log the daily flow data with a timestamp which is supposed to be sent to the cloud via telemetry for at least 2 years.
- In case the telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.
- This data shall also be used for retrieval in case of any dispute between meter data and online data.

3.3 Data Management Software

• The web based Data Management Software must be capable of running on a standard PC compatible with minimum Pentium Processor; in addition, the software must run under Windows XP Professional, Windows Vista, Windows 7 and / or latest version of Windows Operating System and HP Unix, Linux, Solaris, etc.

• The Data Management Software should be cloud base and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.
• The Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email/SMS to the user.

• The Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.
• The Data Management Software should be able to display all kind of data on screen at any time.
• The Data Management Software should have capability to add additional customer information and create customizable data fields.

3.4 Lab Testing / calibration:

Testing or Calibration of meters shall be performed at ISO 17025: 2017 accredited laboratory. The accuracy of meter shall be within ± 2 % in the operating range. The meter shall have valid model approval certificate.

The meter shall have model approval from India or abroad. Every meter should be calibrated / tested for accuracy in the operating flow range (10% to 100%). At least 4 point calibration at 10%, 40%, 70% and 100% of maximum/rated flow shall be performed.

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

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Confederation of Indian Industry
The Mantosh Sondhi Centre
23, Institutional Area, Lodi Road, New Delhi – 110 003 (India)
T: 91 11 45771000 / 24629994-7



WATER AUDIT REPORT

As per the guidelines of CGWA

MINISTRY OF JAL SHAKTI

At

Bajaj Energy Limited, Kundarki, Gonda

Prepared by

Confederation of Indian Industry
CII-Triveni Water Institute

January 2022

Water Audit Report
Bajaj Energy Limited, Kundarki, Gonda

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It is well worthy to mention that the efforts being taken, and the enthusiasm shown by all the personnel towards water conservation are really admirable.



Sanjay Gupta
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CII-Triveni Water Institute

Abbreviations

MGF	Multi-Grade Filter
DMF	Dual Media Filter
UF	Ultrafiltration
RO	Reverse Osmosis
ERS	Effluent Recovery System
CGWA	Central Ground Water Authority
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
ETP	Effluent Treatment Plant
IMD	Indian Meteorological Department
LPCD	Liter Per Capita Per Day
RWH	Rainwater Harvesting
SAC	Strong Acid Cation (DM plant unit)
SBA	Strong Base Anion (DM plant unit)
STP	Sewage Treatment Plant
WTP	Water Treatment Plant

Executive Summary

Bajaj Energy Limited, Gonda, Uttar Pradesh division is a coal based thermal power plant situated in village Kundarki, Gonda region of Gonda District in Uttar Pradesh. It is spread across an area of approx. 26 acres. There are 3 borewells installed inside the plant area. The wastewater generated in the plant is treated in the common effluent treatment plant. The treated effluent from this ETP is used for various activities like firefighting, ash handling, dust suppression and gardening. The specific water consumption for the plant is 2.89 m3/MWh of power generated (October 2020 – September 2021).

Currently, the plant has a valid consent to withdraw 21,60,000 m^3/annum of water from 3 nos. borewells located within the plant area vide Certificate no. 2101398, 2101400, 2101401 with validity upto 17/06/2026 from 3 borewells available inside the plant. At present, approximately 2627 m^3/day (average of October 2020 – September 2021) of water is used for the plant operations. The plant has installed two piezometers with digital water level recorder and at four locations manual piezometer is used for water level monitoring inside the campus in compliance of the conditions mentioned in the NOC issued to them by Ground Water Department, Ministry of Jal Shakti, Government of Uttar Pradesh.

The plant has installed electromagnetic flow meters with SCADA system on all the three borewells. Electromagnetic Flowmeters have also been installed at other locations like Boiler Feed, RO Reject, ETP Outlet, domestic water consumption etc.

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 61.17% which puts Gonda district in the category of safe zone.

Given the above scenario of prevailing resource challenge, accelerating over time the management of Bajaj Energy Limited is very keen to do water audit of their premises. To get benefit of water saving projects, management of Bajaj Energy Limited awarded the task of water audit of its premises at Village Kundarki, Gonda district, Uttar Pradesh to CII Triveni Water Institute.

The audit is focused on improving water usage efficiency and identifying water conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by CII team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis.

Summary of Water Audit findings are presented in the following table shown below:

I	**Total Fresh Water Intake (Daily Average)**	**2627 m^3/day**	
II	**Savings Achievable**	**92.2 m^3/day**	
	Water Saving Potential (%)	**3.5 %**	
Recommended Projects			
Sno.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	2.2	0.04
2	Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup	90	1.82
Observations			
1	Non readable mechanical flow meter at the cooling tower blowdown water line, which needs to be rectified.		
2	Excessive Drift losses from the cooling tower		

- Water balance across the plant has been successfully achieved. Total consumption- Bore well: 2627 m^3/day (average of October 2020 – September 2021)
- Strategies identified for reduction, reuse and recycle show:
  - Collection and Reuse of supernatant MGF backwash water after settling in a settling tank
  - Installation of RO plant for treatment of ETP treated effluent and reuse in cooling towers
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.
- Internal audits to be undertaken at BEL, Gonda (every year); third party audits also recommended.

1. Introduction and background

1.1 Introduction

Water is a core element of natural capital, underpinning many business activities. Water risks cut across most industry sectors. As per the World Economic Forum Global Risks report, water crisis is the third most impactful global risks to business (WEF 2017). The risk continues to rise given the increasing demands and rising pressures. Safeguarding water and ensuring its availability in sufficient quantity and quality is therefore subject of vital interest to business.

Bajaj Energy Limited deals in generating coal-based power for UPPCL. They have an installed capacity of 2x45 MW power plant.

The present study focuses on Bajaj Energy Limited, Kundarki, Gonda unit for water audit at the plant level that would help in identification of appropriate water management and conservative strategies to minimize the risks to operations.

The first step towards efficiently managing and conserving water resources is monitoring and mapping water consumption under various processes. This involves conducting a regular water audit that identifies and quantifies water uses and losses from a water system.

A comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions.

Good initiatives taken by the plant

- Monitoring system for flow by installation of electromagnetic flow meters at borewells and other strategic locations, mechanical flowmeters installed at some locations like ETP Inlet.
- No fresh water is used for horticulture.
- The ETP treated water is used in various applications like gardening, ash handling, dust suppression and firefighting.
- Rainwater harvesting pits have been constructed for recharge of ground water collected from paved road and sideways.
- SWAS panel water is being collected and used as cooling tower makeup.

2. Scope

The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at Bajaj Energy Limited, Kundarki, Gonda.

Scope of work of the study includes the following:

- Study of water sources (size, capacity, quantity, quality)
- Existing water distribution system, associated losses , Wastewater discharge points across the process and Identification of water
- consumption of each existing meter/sub-meter
- Quantification of water distribution network in each section
- Mapping of raw water, process, recirculating water, cooling & domestic, recycling & effluents
- Segregation and collection of waste streams based on quality and quantity
- Study of various treatment & disposal schemes deployed in the plant
- Identification and Recommendations of projects based on reduce reuse & recycle on water Conservation
- On-site discussion with facility manager and personnel
- Monitoring and measurements using pressure and flow meters and various other devices as and when required
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Water system analysis and Quantification of baseline water map
- Developing Water consumption and wastewater generation pattern
- Evolving value added "cost of water" at various water use locations
- Identification of "branch flow unbalancing" at multi-cell cooling tower & associated losses in cooling tower efficiency & high drift losses
- Calculation of Rainwater Harvesting Potential for the site
- Estimating Specific water use and conservation potential
- Evolving recommendations/schemes for improvement in water and wastewater management system With Cost
- Recommendations for reduction in water consumption particularly in two conditions

- Plant Stoppage Condition
- Plant Running Condition

- Checking the compliances of all conditions/requirements as stipulated by government authority such as CGWA,MOEF etc.

3. Methodology of the Study

A team of three engineers were involved in carrying out the study. The study methodology involved the following steps:

- Preliminary discussions with plant personnel and observations in all water consuming areas
- Data collection through discussions, past records, specifications
- Identification of water conservation options on short, medium & long terms
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion, and submission of report to the management

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of portable instruments for carrying out various measurements and analyses. CII has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support water audit investigations and analyses. The specialized instruments that were used during the water audit include Ultrasonic water flow meter.

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

4. Assessment of Present Water Usage

4.1 Plant Water Consumption Trends

The source of water to the plant is borewell. Borewell water is majorly used for cooling and production applications after suitable treatment in water treatment plant. Borewell water is also utilized for domestic applications. The figure below indicates the water consumption trend from October 2020 to September 2021. The uneven water consumption trend could be noticed because of the plant gets instructions from UPPCL for shutdown based on load requirements.

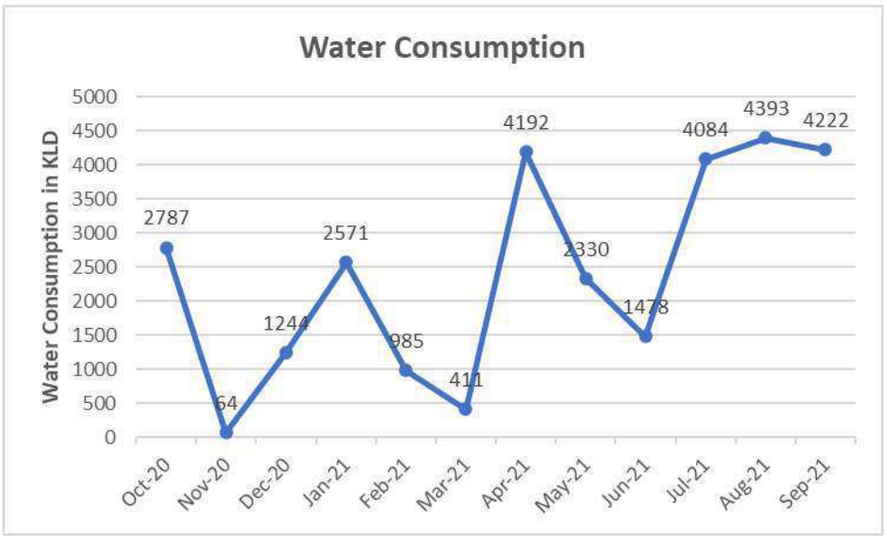


Figure 4.1 Water Consumption Trend Oct-20 to Sep-2

Specific Water Consumption

The specific water consumption is 2.89 m^3/MWH based on the data (October 2020 – September 2021) provided by the BEL, Kundarki team.

4.2 Water Sources

The source of water to the plant is borewells. The plant has 3 borewells within its premises. Raw water is majorly utilized for cooling tower makeup and producing DM water which is utilized for feed to the Boiler. The average daily water consumption through borewells is 2627 m^3/day (October 2020 - September 2021).

The total water consumption for past three calendar years is as follows:

Table 4.1 Water consumption trends for past 3 years

Year	Jan – Dec 2018	Jan – Dec 2019	Jan – Dec 2020
Water Consumption (m^3/year)	672581	383877	634054

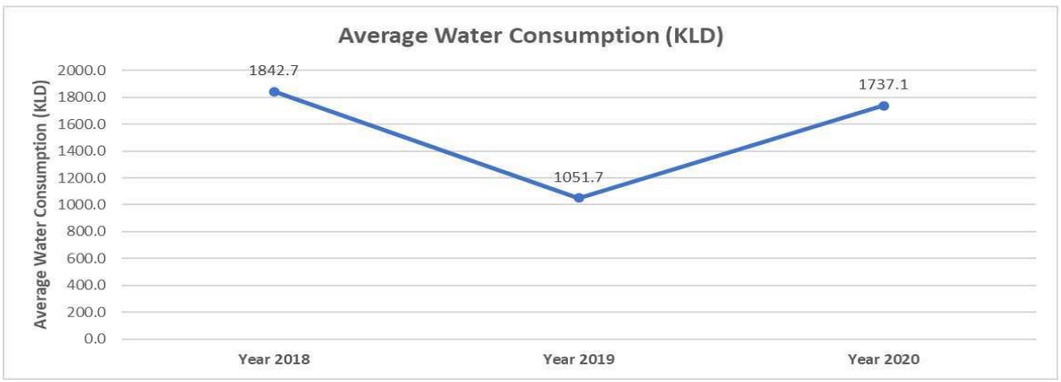


Figure 4.2 Water Consumption Trend for year 2018 - 2020

The running hours of borewell range from 7-19 hours (as per NOC) and they are run depending upon requirement and run in rotation to keep them functional. Only one borewell is run at any time.

The detailed description about the water source is provided below in the tabular form in table:

Table 4.2 Borewell Details

S.No.	Description	Depth (ft.)	Age (yrs)	TDS (ppm)	Pumping capacity (m^3/h)
1	Borewell-1	121.95	11	363	180
2	Borewell-2	121.95	11	384	180
3	Borewell-3	121.95	11	413	180

Rainfall Pattern in last 5 years as per IMD

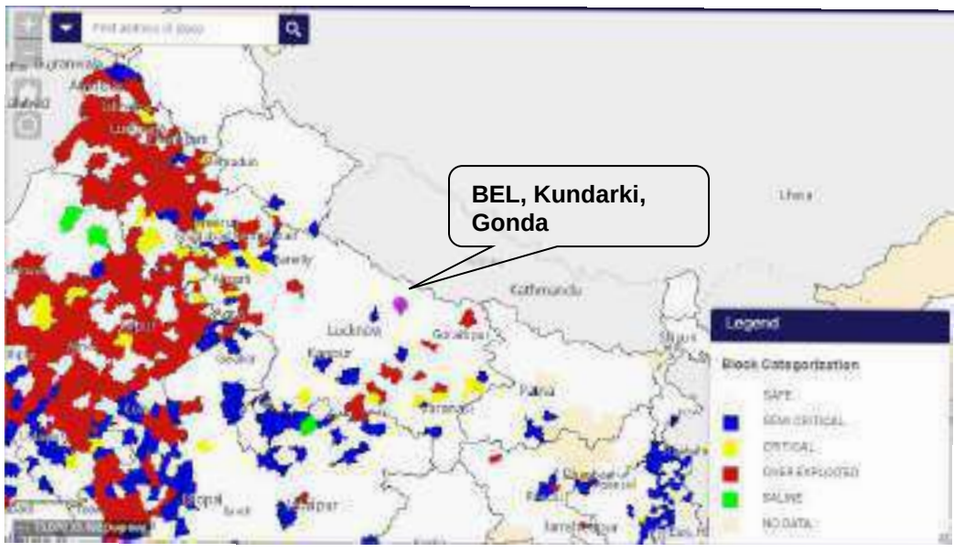
Total rainfall received at Gonda district, based on IMD datasets shows that average rainfall is around 867 mm. The rainfall varies between 708 mm to 1114 mm in last 5 years (2016 to 2020).

Table 4.3 Average annual rainfall (mm) in last 5 years as per IMD data

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2016	7.5	0	0.3	0	46.9	109.1	439.1	138.8	110.2	25.6	0	0	877.5
2017	10.5	0	6	0	43	47.7	332.2	164.3	73.1	0	0	0	676.8
2018	0	10	0	19.9	30.8	36.2	246.6	278.9	85.7	0	0	0	708.1
2019	20.5	48.1	4	4.5	0	90.1	348.3	128.9	297	2	0	15.3	958.7
2020	61.2	19.9	77	7.7	90.4	236.1	348.1	201.7	65.6	0	7.2	0	1114.9
												Average	867.2

Groundwater situation at the plant site

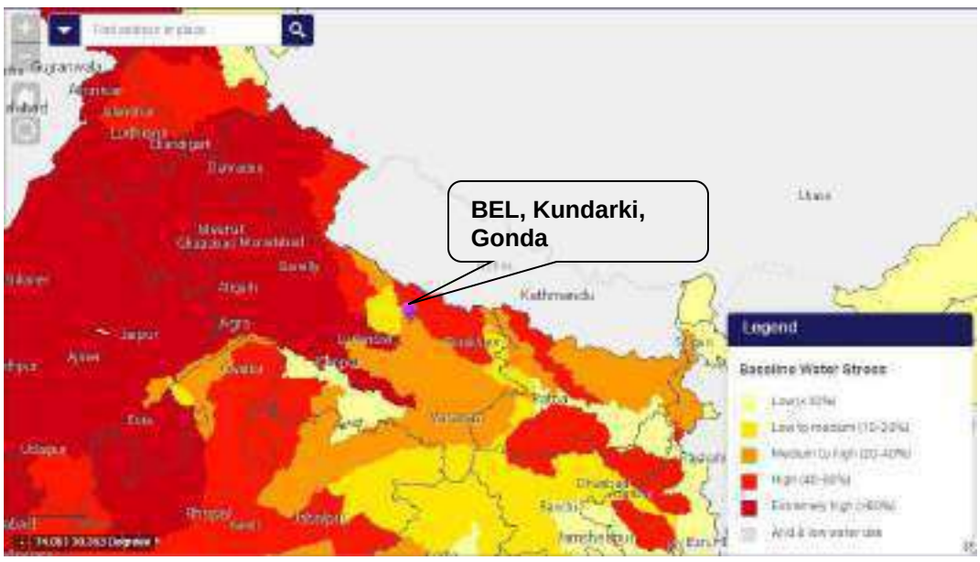
The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 61.17% which puts Gonda district in the category of safe zone.



Source: India Water Tool 3.0

Figure 4.3 Groundwater Block Categorization of Gonda district

As per the India water tool the plant lies in Medium to High baseline water stress zone. Higher value indicates that there is more competition among users related to water for domestic, industrial, agriculture and other purpose



Source: India Water Tool 3.0

Figure 4.4 Baseline Water Stress of Gonda District

4.3 Water Supply & Distribution Details

The water extracted from any of the 3 borewells is pumped through a common header line to the cooling towers, inlet to DM plant and for domestic water utilization. The major water consumer in the unit is the cooling tower.

For generation of DM water, the raw water from the borewells is first fed to a Multi Grade Filter (MGF) followed by a 2 stage RO system of 16 m3/h (inlet) Capacity. The RO- permeate generated is fed to the DM plant which consists of Strong Acid Cation (SAC) followed by Strong base Anion (SBA) followed by Mixed Bed (MB). The reject from the RO and regeneration from the SAC, SBA & MB go to the N-pit. The DM water generated post MB is stored in 2 nos. DM water storage tanks of 221 m^3 and 158 m^3 (total DM water storage capacity 379 m^3) The DM water is used as feed to the boiler.

4.4 Water Balance

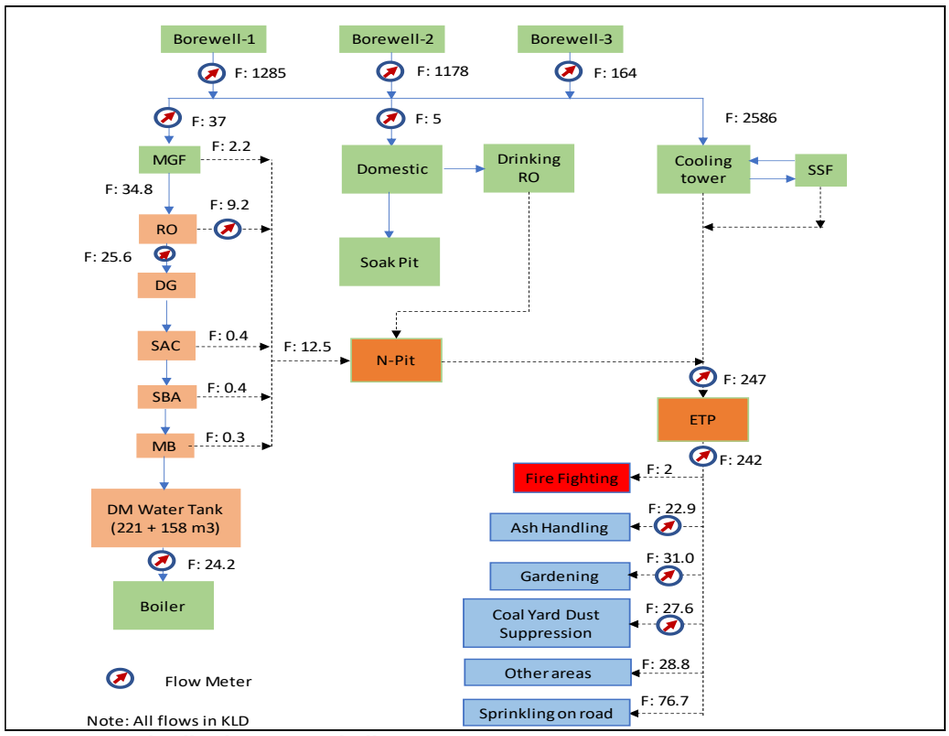


Figure 4.5 Water Distribution network diagram

NOTE: This balance has been prepared on average of the data from October 2020 – September 2021

Overall plant water balance is shown below in tabular form in table 4.4

Table 4.4 Overall Water Balance (Average)

Fresh water Balance			
Sno.	**Description**	**Quantity (KLD)**	**Remarks**
1	Inlet from BW-1	1285	FM reading
2	Inlet from BW-2	1178	FM reading
3	Inlet from BW-3	164	FM reading
	Total freshwater Inlet	**2627**	
Fresh water Distribution			
4	Inlet to DM Plant	37	FM reading
5	For Domestic Water Consumption	5	FM reading
6	As Cooling Tower Makeup	2586	Calculated value
	Total Fresh Water Distribution	**2628**	
DM Plant water balance			
7	Inlet to MGF	37	
8	MGF Backwash	2.2	
9	RO Inlet	34.8	
10	RO Reject	9.2	
11	Inlet to DM Plant SAC	25.6	
12	SAC Regeneration	0.44	Calculated based on DM water consumption & OBR of 288, 288/24.2
13	SBA Regeneration	0.41	
14	MB Regeneration	0.33	
15	DM water feed to Boiler	24.2	

4.5 Domestic water Consumption

Present domestic water consumption is 5 m^3/day (based on flowmeter readings). Domestic water consumption in the plant is accounted for applications like drinking, hand wash and toilet flushing.

The water supply and usage patterns were discussed with plant personnel and the observations are as follows:

- Separate meter is installed for measurement of domestic water consumption for the Plant.
- Water closets in plant are of western type with single flush type. However, the size of cisterns are large.

- ❖ Handwash taps in the plant are normal bib taps.
- ❖ Canteen is not present in the plant

- ❖ Total number of consumers (Permanent+ workers+ Visitors) = 215
- ❖ Water Consumption = 5 m^3/day
- ❖ Per capita Consumption = 23.2 LPCD

As per CGWA gazette notification, the recommended domestic water requirement is 30 LPCD

The domestic water consumption is within limits as compared to the benchmark.

4.6 Rainwater Recharge

During the water audit study of the plant, it was found that plant is practicing the rainwater recharge by means of rooftop collection through storm water drainage network.

Presently the plant has 3 recharge structures constructed for recharge of roof top and paved areas. The combined recharge capacity of the all the 3 pits is 6885 m3 as per the design details shared by the plant team

Rainwater harvesting potential is the total amount of rainwater that can be harvested from a given site throughout the year. It can be calculated using the following formula:

Rainwater Harvesting Potential (KL) =
Catchment Area (sq.m.) x Average Annual Rainfall (m) x Run-off Coefficient

Average Annual Rainfall for Gonda[1] = 867.2 mm

The plant has a large area which serves as a good surface for collecting rainwater.

The following table summarizes the total rainwater harvesting potential from the plant:

[1] Source: IMD: 2016-2020

Table 4.5 Rainwater Recharge potential

Description	Area (m^2)	Runoff coefficient	Annual Rainfall (mm)	RWH Potential (KL)
Rooftop area (m^2)	5164	0.85	867.2	3806
Green Area (m^2)	39759.77	0.15		5172
Unpaved area (m^2)	61670*	0.15		8022
Total				**17000**

*Since detail of paved area was not available, the unpaved area was calculated by subtracting total area of the plant – rooftop area – Green area

It can be seen from the table above that there exists total rainwater harvesting potential of 17000 KL throughout the plant.

Currently 6885 m3 of rainwater is being recharged with the help of 3 rainwater harvesting pits installed as per the details provided by the plant team.

4.7 Water Metering & Monitoring System

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. The presence and regular monitoring of flow meters ensures that the flows in the plant are well accounted. During the audit, the available flow meters were identified, and their working conditions were checked. The plant has installed flowmeters at various strategic locations, the flowmeter readings in comparison with ultrasonic flow meter readings have been detailed in annexure 2.

4.8 Water Costing

The cost of raw water is illustrated given below in table:

Table 4.6 Water Cost

S. No.	Description	Total Cost (Rs. /m^3)
1	Borewell Water (as per the charges by UP ground water authority)	5.0

5. Water & Wastewater Treatment Practices

This section provides the detailed analysis of the data along with the key findings.

The effluent generated from the plant is treated in an Effluent Treatment Plant (1000 KLD) and the treated effluent is used for gardening, ash handling, dust suppression, firefighting etc.

Table 5.1 Wastewater Discharge Status

S. No.	Description	Quantity (KLD)	Mode of Disposal
1	Cooling Tower Blowdown	234.5	Effluent Treatment Plant
2	MGF Backwash	2.2	
3	RO Reject	9.2	
4	SAC Regeneration	0.4	
5	SBA Regeneration	0.4	
6	MB Regeneration	0.3	

5.1 Raw/Fresh water Treatment

The water from all three borewells is supplied to the Water treatment plant. The treatment plants consist of MGF and RO system followed by DM plant. Though they have installed softener, but at the time audit it was not operational and as per inputs from the plant team the softener is not being used at all. The water after passing to the RO system, goes to the DG, SAC, SBA and MB. The DM water generated post MD is stored in DM water storage tanks of 221 m^3 and 158 m^3. The wastewater from the MGF backwash, RO Reject and DM plant regeneration is collected into the N-pit from where it is sent to the ETP plant for further treatment.

For cooling purpose, water is being fed through these three borewells into the cooling towers and its blowdown water is sent directly to the ETP after mixing with the N-pit discharge water. These borewells also meet the requirement for domestic purposes primarily for drinking purposes.

A schematic of the water treatment system inside the plant is shown below:

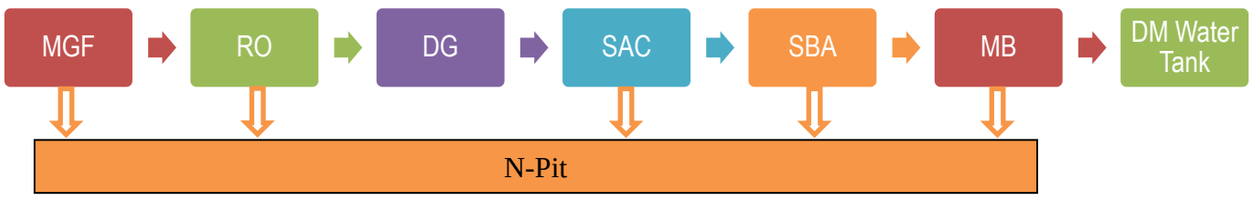


Figure 5.1: Schematic diagram of water treatment system

5.2 Waste Treatment & Disposal

The schematic of wastewater treatment and disposal is shown below

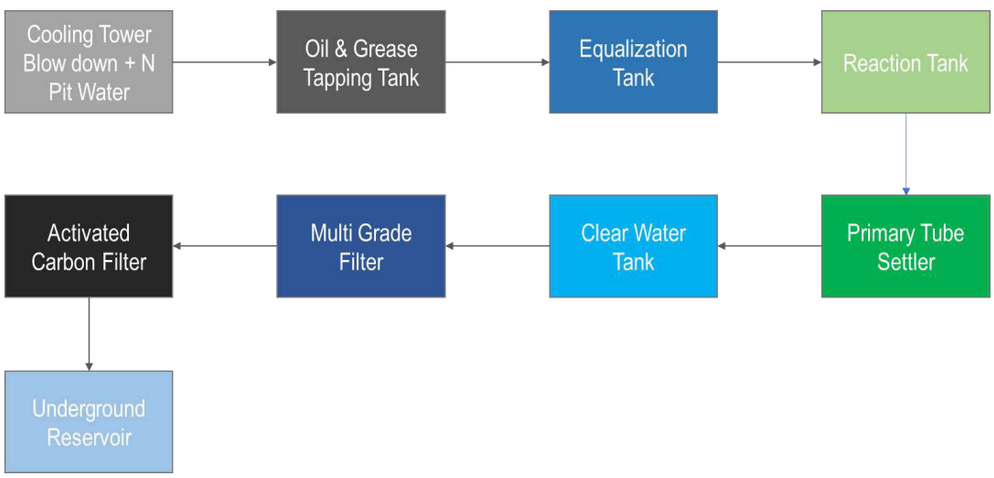
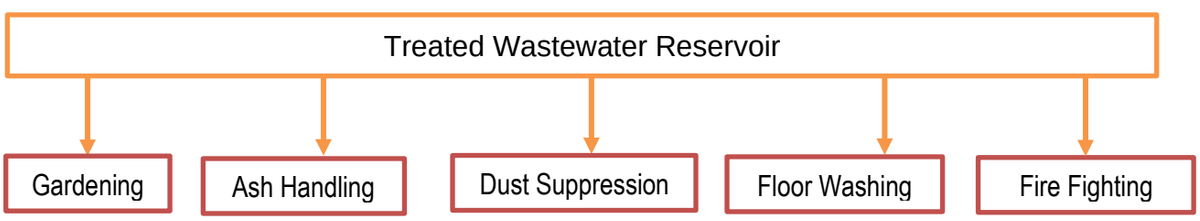


Figure 5.2 Schematic of Effluent Treatment plant

The treated water from the ETP is used for various secondary activities such as gardening, ash handling, dust suppression and floor washing.



5.3 Environmental Compliance related to Water

- BEL, Kundarki is currently extracting 2627 m^3/day (Average from October 2020 – September 2021) against a permission of 7200 m^3/day (calculated based on rated discharge & permitted running hours).
- Plant has installed Electromagnetic flow meters at all the 3 borewells and at remaining locations Electromagnetic/ mechanical flow meters have been installed.
- 02 nos. Piezometer with Digital water level recorder and at four locations manual piezometer is used for water level monitoring in the campus in compliance of the NOC conditions. The piezometers with DWLR support telemetry.
- As per the NOC issued by Ministry of Jal Shakti, Government of Uttar Pradesh the plant has to adopt rainwater harvesting/ recharge in the project premises. 3 nos. rainwater harvesting pits have also been constructed within the campus to collect rainwater from the paved roads and cemented sideways.
- Ground water quality is being regularly monitored through inhouse laboratory and the samples are also sent to NABL accredited lab for testing. The reports have been attached along in annexures.

6. Water Conservation Opportunities

6.1 Water Saving Proposal 1: Reuse of filter backwash (MGF) water after settlement in a settling tank

6.1.1 Present Status

Presently the MGF backwash being generated from the Multi Grade Filter is being discharged into the common drain which goes to the N-pit.

The schematic of the present system is shown below:

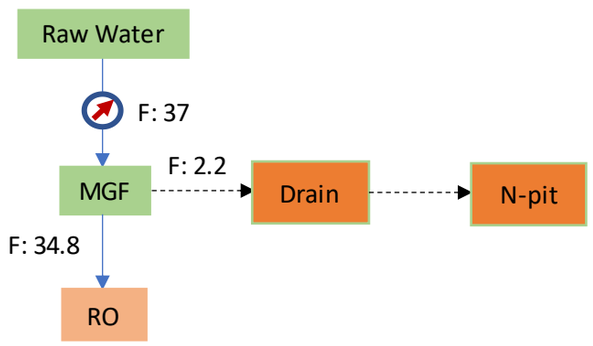


Figure 6.1: Schematic of present system of MGF Backwash

6.1.2 Recommendation

It is recommended to reuse the backwash water from the MGF and instead of sending it to the N-pit, the filter backwash should be stored in a settling tank to store water and allow for settlement of the supernatant particles. This backwash water does not have any impurities except for suspended particles and after settlement, the supernatant water quality will be equivalent to the raw water quality.

The schematic of the proposed system is shown below:

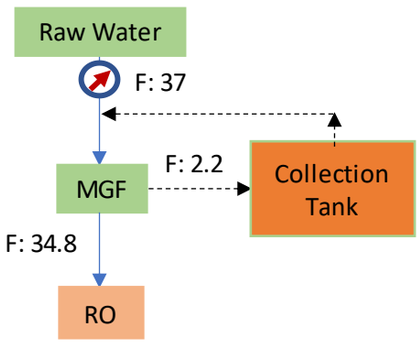


Figure 6.2: Schematic of proposed system of MGF Backwash

6.1.3 Benefits

The fresh water saving potential of about 2.2 m^3/day with cost benefit analysis as below.

Table 6.1 Cost – Benefits: Reuse of filter backwash (MGF) water after settlement in a settling tank

Estimated Parameters	Units	Based on Raw water cost @ Rs. 5.0/m^3 (as per UP ground water authority)
Daily water savings	m^3/day	2.2
Annual water savings	m^3/year	803
Annual cost Savings	Rs. Lakhs	0.04

6.2 Water Saving Proposal 2: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

6.2.1 Present Status

Presently the ETP treated water is being used for low end applications such as Ash handling, Gardening, Coal yard dust suppression, sprinkling on road etc. Some water also remains as a part of 16000 m3 storage tank. This water has great potential to reduce the freshwater makeup to the cooling tower. The total quantity of ETP treated water is 242 KLD.

6.2.2 Recommendation

It is recommended to install a 3 stage RO system with MEE system to treat excess ETP treated water which presently is being consumed in other areas i.e 28.8 KLD & sprinkling on road i.e 76.7 KLD.

The capacity of the RO should be 105 KLD or approximately 10.5 KL/h considering 10 hours working. The overall recovery of the system will be 95% and the remaining 5% would get converted to salt through MEE.

6.2.3 Benefits

The fresh water saving potential of about 100 m^3/day with cost benefit analysis as below.

Table 6.2 Cost – Benefits: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5.0/m^3 (as per UP ground water authority)**
Daily water savings	m^3/day	100
Annual water savings	m^3/year	36,500
Annual cost Savings	Rs. Lakhs	1.82
Estimated cost (Approx)	Rs. Lakhs	100
Payback Period	Years	55

7. Observations

7.1 Observation 1: Non-readable mechanical flowmeter at the cooling tower blowdown water line

7.1.1 Present Status

The mechanical flowmeter installed on the cooling tower blowdown line was unreadable as the glass was not clear.

7.1.2 Recommendation

It is recommended to get the glass of the mechanical flowmeter changed in order to make the flowmeter readings clearly legible and easy to note during monthly meter reading collection.

7.2 Observation 2: Excessive drift losses from the cooling tower

7.2.1 Present Status

During the site visit it was observed that the lawn near the cooling tower was completely wet, accumulation of water in the garden near cooling tower suggests excessive drift losses from the cooling tower. Also it could be visibly observed that there were excessive drift losses from the cooling towers.

7.2.2 Recommendation

It is recommended to installed drift eliminators in the cooling tower to avoid spillage of recirculating water from the cooling tower. During discussions with the plant personnel it was understood that the plant is already working on this.

8. Implementation Plan

To better understand and comprehensively assess the water usage in the various processes and explore possibilities of water saving, Bajaj Energy Limited and CII- Water Institute partnered to undertake a detailed water audit of the plant.

The previous chapter detailed out the water saving proposals along with the key recommendations and, costs and benefits to the plant from their adoption. This chapter summarizes the key points emerging along with the way forward towards formulation of a Water Efficiency Plan.

The summary of total water savings emanating from proposed water saving proposals is shown in table 8.1.

Table 8.1 Water saving projects: summary for recommendations

I	**Total Fresh Water Intake (Daily Average)**	**2627 m^3/day**	
II	**Savings Achievable**	**92.2 m^3/day**	
	Water Saving Potential (%)	**3.5 %**	
Recommended Projects			
Sno.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	2.2	0.04
2	Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup	90	1.82
Observations			
1	Non readable mechanical flow meter at the cooling tower blowdown water line, which needs to be rectified.		
2	Excessive Drift losses from the cooling tower		

8.1 Conclusions

8.1.1 Conclusion 1

Water balance across the plant has been successfully achieved
Total consumption: 2627 m^3/day

8.1.2 Conclusion 2

Strategies identified for reduction, reuse and recycle show:

- Around 3.5 % saving can be achieved.
- Reduction in freshwater makeup for the cooling tower high potential to reduce overall groundwater withdrawal

8.1.3 Way Forward

❖ Prioritize projects

- Priority areas where immediate savings can be achieved include reuse of filter backwash water (MGF) after settlement in a settling tank.
- Installation of a RO system for treatment of ETP treated water has good potential to reduce the cooling tower freshwater makeup.
- Rainwater collection and harvesting is an important project and could be executed.
- Need to adopt schemes for water management and conservation (Recycle, Reuse and Reduce options)
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Monitor proposal-by-proposal

❖ Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.

❖ Internal audits to be undertaken at Bajaj Energy Limited units; third party audits also recommended.

Annexure I: Data Received from Plant Team

Water Consumption data

Borewell	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Total (KL/Annum)	Avg (KLD)
Borewell-1	48011	54	23394	44882	12823	9087	68072	39827	65237	54977	48287	54424	469075	**1285**
Borewell-2	38374	1856	15159	34818	14756	3658	57695	32416	57679	62185	63611	47697	429904	**1178**
Borewell-3	0	0	0	0	0	0	0	0	1748	9435	24278	24524	59985	**164**

Specific Water Consumption data

	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Average
Water consumption (m3)	**86385**	**1910**	**38553**	**79700**	**27579**	**12745**	**125767**	**72243**	**124664**	**126597**	**136176**	**126645**	958964
Production – Power (MWh)	30120	0	13590	29520	9860	1179	42160	23700	43810	44470	49520	43990	331919
Specific Water Consumption (m3/MWh)	2.87	-	2.84	2.70	2.80	10.81	2.98	3.05	2.85	2.85	2.75	2.88	2.89

Cooling Tower Details

S. No.	Description	Recirculation Rate, m^3/hr
1	CT-1	17200

Piezometer Reading

DATE	TIME	WATER LEVEL (m)	DATE	TIME	WATER LEVEL (m)
01-11-2021	23:00:00	2.68	01-02-2020	23:00:00	4.71
01-10-2021	23:00:00	2.13	01-12-2019	23:00:00	4.47
01-09-2021	23:00:00	2.4	04-09-2019	23:00:00	3.31
01-08-2021	23:00:00	3.1	04-08-2019	23:00:00	6.37
01-07-2021	23:00:00	5.04			
01-06-2021	23:00:00	4.86			
01-05-2021	23:00:00	5.68			
01-04-2021	23:00:00	5.34			
01-03-2021	23:00:00	4.5			
01-02-2021	23:00:00	4.6			
01-01-2021	23:00:00	4.55			
01-12-2020	23:00:00	3.72			
01-11-2020	23:00:00	3.12			
01-10-2020	23:00:00	3.05			
01-09-2020	23:00:00	2.33			
01-08-2020	23:00:00	2.13			
01-07-2020	23:00:00	5.45			
01-06-2020	23:00:00	5.3			
01-05-2020	23:00:00	4.78			
01-04-2020	23:00:00	5.05			
13-03-2020	23:00:00	4.82			

Annexure II: Minimum Water Requirements

In view of the Gazette of India Notification Part II- Section 3 – Sub-section (ii) (CG-DL-E-24092020-221952, No. 2941), dated September 24, 2020, " All industries abstracting ground water in excess of 100 m3 /d shall be required to undertake annual water audit through Confederation of Indian Industry (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/PHDCCC certified auditors and submit audit reports within three months of completion of the same to CGWA".

An attempt was made to understand the minimum water required for regular plant operations.

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m3/MWH.

The specific water consumption for Bajaj Energy Limited, Utraula, Balrampur is 2.89 m3/MWh of power generated (October 2020 – September 2021) Since the plant was running at less than the full load due to COVID-19 pandemic and coal shortage, approximately 2627 m3/day (average of October 2020 – September 2021) of water was being used for the plant operations.

The details of NOC for withdrawal of ground water are as under:

Water withdrawal permission as per CGWA NOC - BEL Gonda				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
13	Certificate no. 2101398	1026000	KL/Annum	
14	Certificate no. 2101400	756000	KL/Annum	
15	Certificate no. 2101401	378000	KL/Annum	
16	Total water withdrawal NOC	2160000	KL/Annum	
E	**Permissible water withdrawal at 100% load**	**7200.0**	**KL/day**	**300 days working**
F	**Permissible water withdrawal at 70% load**	**5040.0**	**KL/day**	**300 days working**
Condition A: Plant working at 100% load condition				

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
1	Design recirculation rate	17200	m3/h	
2	Actual recirculation rate	16104		
3	COC	7		
4	Temperature difference	10		
5	Evaporation loss	5913	m3/day	
6	Drift Loss	77.3	m3/day	considering 0.02%
7	Blowdown	985.6	m3/day	

A	**Total makeup to the cooling circuit**	**6976.3**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
8	Total Staff Strength	165	Nos.	
9	Floating population	50	Nos.	
10	Recommended domestic water consumption	30	LPCD	
11	Total Domestic water consumption	6.45	m3/day	
12	Considering 15% extra	7.4	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**65**	**m3/day**	

D	**Total Minimum water requirement at 100 % load**	**7048.7**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
13	Cooling tower blowdown	985.6	**m3/day**	
14	Permeate recycled in cooling tower	591.3	**m3/day**	
15	Reject	394.2	**m3/day**	The reject will be used for dust suppression & ash quenching
16	New minimum water demand at 100% load	6457.3	**m3/day**	
17	Saving potential over NOC quantity	10.31%		

Case-2 : Saving potential with COC increased to 9				
18	COC	9		
19	Blowdown	739.2	**m3/day**	
20	Permeate recycled in cooling tower	443.5	**m3/day**	60% recovery
21	Reject	295.7	**m3/day**	The reject will be used for dust suppression & ash quenching
22	New minimum water demand at 100% load	6358.8	**m3/day**	
23	Saving potential over NOC quantity	11.68%		
Maximum saving possible at 100% load is 11.68% over NOC quantity				

Condition B: Plant working at 70% load condition

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
24	Design recirculation rate	17200	m3/h	
25	Actual recirculation rate	11272.8		at 70% load
26	COC	7		
27	Temperature difference	10		
28	Evaporation loss	4139.4	m3/day	
29	Drift Loss	54.1	m3/day	considering 0.02%
30	Blowdown	689.9	m3/day	
A	**Total makeup to the cooling circuit**	**4883.4**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
31	Total Staff Strength	160	Nos.	
32	Floating population	50	Nos.	
33	Recommended domestic water consumption	30	LPCD	
34	Total Domestic water consumption	6.3	m3/day	
35	Considering 15% extra	7.2	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**37**	**m3/day**	

D	**Total Minimum water requirement**	**4927.6**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7

36	Cooling tower blowdown	689.9	**m3/day**	
37	Permeate recycled in cooling tower	413.9	**m3/day**	60% recovery
38	Reject	276.0	**m3/day**	The reject will be used for dust suppression & ash quenching
39	New minimum water demand at 100% load	4513.7	**m3/day**	
40	Saving potential over minimum water requirement	8.40%		Considering same COC
41	Saving potential over NOC quantity	10.44%		

Case-2 : Saving potential with COC increased to 9				
42	COC	9		

43	Blowdown	517.4	**m3/day**	
44	Permeate recycled in cooling tower	310.5	**m3/day**	
45	Reject	207.0	**m3/day**	The reject will be used for dust suppression & ash quenching
46	New minimum water demand at 100% load	4444.7	**m3/day**	
47	Saving potential over minimum water requirement	9.80%		Considering COC of 9
48	Saving potential over NOC quantity	11.81%		

Maximum saving possible at 70% load is 11.81%

Annexure III: Measurement done by CII

Bajaj Energy Limited, Kundarki, Gonda					
Flow measurement Sheet					
Sno.	**Meter Location**	**Type of meter**	**Meter reading**		**Remarks**
			CII	**BEL**	
1	Borewell-1	EM	157.5	156	
2	Borewell-2	EM	163	166	
3	Borewell-3	EM	171	176	
4	ETP Outlet	EM	35	70	Difference could be due to deposition or scaling in the pipeline
5	ETP Inlet	Mechanical	52		
6	Boiler Feed	EM	16	16	
7	MGF Feed	EM	15.5	16	
8	RO-1 Permeate	EM	11	12	
9	RO-1 Reject	EM	4.3	4	
10	RO-2 Permeate	EM	11	12	
11	RO-2 Reject	EM	4.7	4.1	
12	Cooling tower recirculation	NA	5800-6200	-	Pumping capacity 8600 m3/h
13		NA	6400		

Annexure IV: Drinking water standard IS 10500 (2012)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 3.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

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Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	14)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (ulpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

Annexure V: IS 1172: 1993 Code of Basic Requirements for water supply, drainage and sanitation

4 general rule the following rates per capita per day may be considered minimum for domestic and non domestic needs:

1) For communities with population up to 20 000 and without flushing system

a) water supply through standpost — 40 lphd (*Min*)

b) water supply through home service connection — 70 to 100 lphd

2) For communities with population 20 000 to 100,000 together with full flushing system — 100 to 150 lphd

3) For communities with population above 100 000 together with full flushing system — 150 to 200 lphd

NOTE — The value of water supply given as 150 to 200 litres per head per day may be reduced to 135 litres per head per day for houses for Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions.

4.1.1 Out of the 150 to 200 litres per head per day, 45 litres per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

4.2 Water Supply for Buildings Other Than Residences

Minimum requirements for water supply for buildings other than residences shall be in accordance with Table 1.

Table 1 Water Requirements for Buildings Other than Residences

Sl No.	Type of Building	Consumption Per Day, litres
(1)	(2)	(3)
i)	Factories where bath rooms are required to be provided	45 per head
ii)	Factories where no bath rooms are required to be provided	30 per head
iii)	Hospitals (including laundry) :	
	a) Number of beds not exceeding 100	340 per head
	b) Number of beds exceeding 100	450 per head
iv)	Nurses' homes and medical quarters	135 per head
v)	Hostels	135 per head
vi)	Hotel	180 per head
vii)	Offices	45 per head
viii)	Restaurants	70 per seat
ix)	Cinemas, concert halls and theatres	15 per seat
x)	Schools:	
	a) Day schools	45 per head
	b) Boarding schools	135 per head

NOTE — For fire demand in buildings refer IS 9668 : 1991.

5 DRAINAGE AND SANITATION REQUIREMENTS

5.1 General

There shall be at least one water tap and arrangements for drainage in the vicinity of each water-closet or group of water-closets in all buildings.

5.2 Residences

5.2.1 Dwellings with individual conveniences shall have at least the following fitments:

a) One bath room provided with a tap,

b) One water-closet, and

c) One nahani or sink either in the floor or raised from the floor with a tap.

Where only one water-closet is provided in a dwelling, the bath and water-closet shall be separately accommodated.

NOTE — Water-closets, unless otherwise indicated, shall be of Indian style (squatting type).

5.2.2 Dwellings without individual conveniences shall have the following fitments:

a) One water tap with draining arrangement in each tenement,

b) One water-closet and one bath for every two tenements, and

c) Water taps in common bath rooms.

5.3 Buildings Other Than Residences

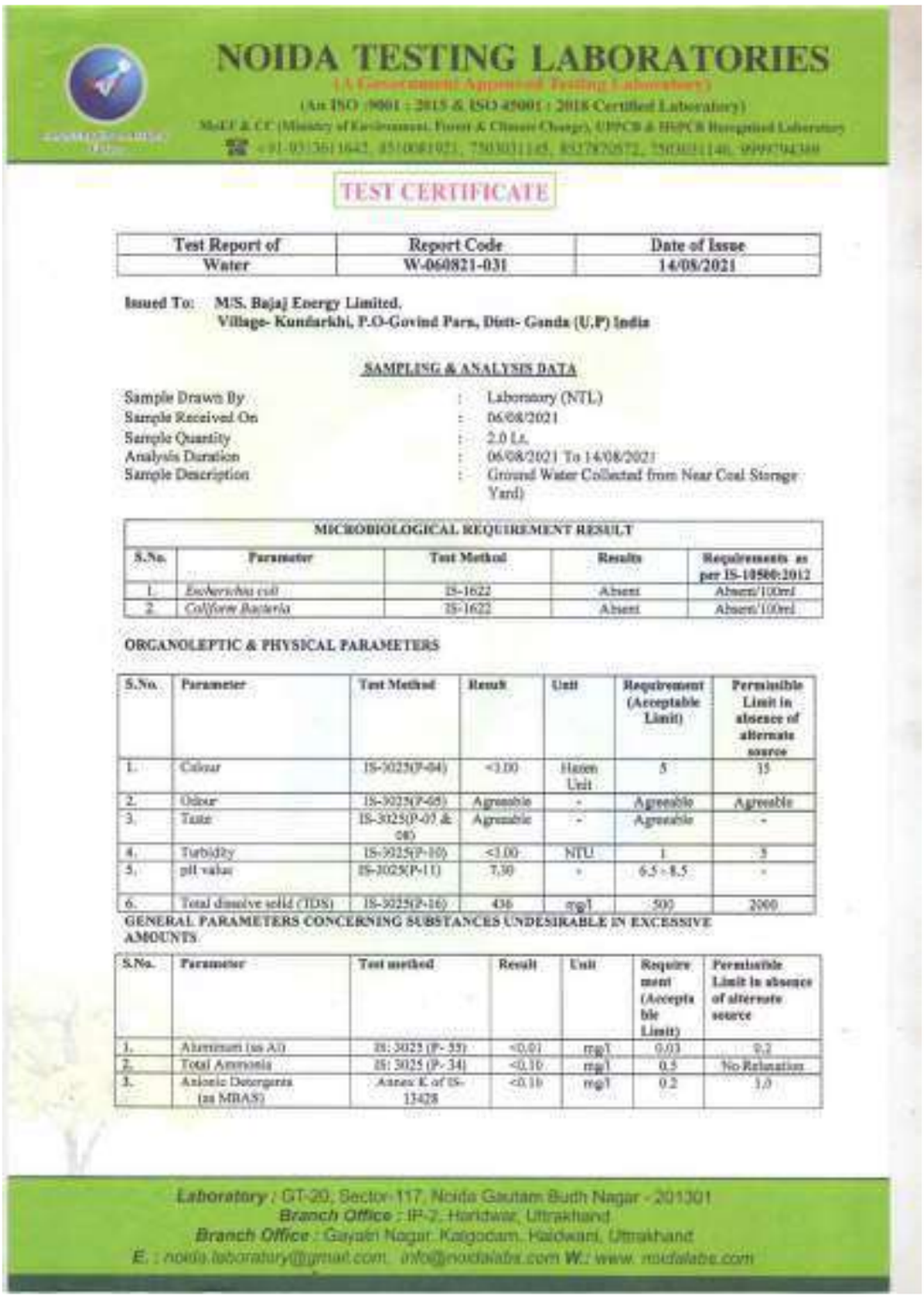
The requirements for fitments for drainage and sanitation in case of buildings other than residences shall be in accordance with Tables 2 to 12.

6 WATER SUPPLY, DRAINAGE AND SANITATION REQUIREMENTS FOR RAILWAY PLATFORMS, BUS STATIONS, BUS TERMINALS AND AIRPORTS

6.1 General

The water supply, drainage and sanitation requirement specified in 6.2 to 6.4 for railway stations, bus stations, bus terminals, sea ports

Annexure VI: Borewell & ETP Quality test reports



NOIDA TESTING LABORATORIES

(An ISO 9001 : 2015 & ISO 45001 : 2018 Certified Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & HSPCB Recognized Laboratory

☎ +91-95136) 1642, 8510081021, 7503031165, 8527876572, 7503031140, 9999704360

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-060821-031	14/08/2021

Issued To: M/S. Bajaj Energy Limited,
Village- Kundarkhi, P.O-Govind Pura, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 06/08/2021 To 14/08/2021
Sample Description : Ground Water Collected from Near Coal Storage Yard)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.30	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	436	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-7, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar, Kalgodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com *W.:* www. noidalabs.com

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TEST CERTIFICATE

4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P-57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P-40)	61.84	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P-26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P-32)	23.17	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.21	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.112	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)		mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P-34)	2.04	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P-56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P-24)	18.26	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P-23)	358.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P-21)	260.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P-49)	<0.2	mg/l	7.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Notes:

1. The results given shown are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless and specified by the customer.

CHECKED BY **AUTHORIZED SIGNATORY**

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar, Katgodam, Haldwani, Uttrakhand
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-060821-015	14/08/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/08/2021
Sample Drawn By	:	Mr. Umashankar Shanna (NTL)
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1lt/Plastic Cane
Analysis Duration	:	06/08/2021 to 14/08/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.68	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	142	mg/l
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B:2005	389	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	72.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	2.5	mg/l

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-060821-016	14/08/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/08/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	ETP Outlet
Sample Quantity/Packing detail	:	1lt/Plastic Cane
Analysis Duration	:	06/08/2021 to 14/08/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11):1983	7.44	-	5.0-9.0
2.	Total Suspended Solid	IS:3025(Part-17):1984	11.3	mg/l	100
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 D:2005	32.0	mg/l	250
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	6.6	mg/l	30
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l	10

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
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Annexure VII: Water Saving Gadgets

Electronic Taps (e-taps)

The latest trend in industries is to install electronic taps (e-taps). The advantages of using e-taps are as mentioned below:

- Unlike conventional taps, there is no twisting or turning in e-taps. They have a sensor, which cuts off water supply completely when not in use. This helps in saving up to 70% water during hand wash

- E-taps enable hands free operation. No fear of cross contamination or contact with germs. E-taps score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.

- E-taps can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.

- The touch free electronic taps, available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Operation of Electronic Taps

This has been successfully implemented in several hotels & restaurants. Of late, several industries have also started implementing this proposal.

Thus, there is a good potential to optimize the freshwater consumption by replacing the existing taps with e-taps.

Electronic flush (e-flush) urinals

The latest trend in industries is to install e-flush urinals. The advantages of using e-flush urinals are as mentioned below:

- E-flush urinals are fitted with a sensor, which senses the usage and flush with water for few seconds after use. This helps in saving 70% water during urinal flush
- E-flush urinals enable hands free operation and score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.
- E-flush urinals can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.
- The touch free e-flush urinals available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Photographs: Electronic flush urinals

Waterless urinals

Waterless urinals eliminate 100% water usage in urinal flush. The concept is based on blue seal technology. The patented blue seal density is lesser than urine and hence allows the passage of urine and acts as a protective layer. The blue seal also eliminates odour emanating from urine. The blue seal is bio-degradable and has to be replaced once in 5000-7000 usages.






Photographs: waterless urinals

Hand wash
NEERR nozzles

Demonstration conducted at a site showed a water saving of 92.18% in the mist mode, 85% in the foam mode and 60% with the normal aerator nozzle.



Photographs: Basic Aerator, NEERR nozzle: Foam Mode and NEERR nozzle: Mist Mode

Thus, 85% water saving can be assumed though installation of these NEERR nozzles.

Technical details about the product: NEERR[2] nozzles are based on water A.R.T. (Atomizer Reduction Technology)[3], which atomizes the water and creates a heavy mist, hence reducing the consumption in any washing application by up to 95%. There are two modes available in the same nozzle:

Mist Mode: Saves up-to 95% water (at 3 bar pressure). It is perfect for daily utility activities like brushing, washing dishes etc.

Normal Mode: With a twist, Neerr switches to normal mode, which still saves up to 75% water (at 3 bar pressure). It is more useful while filling glasses, pots etc.

Installation: Retrofits into the existing tap**;** Unscrew the existing aerator and insert the Neerr Nozzle.

Dimensions: Fits Standard (20.8 mm), Junior (18.1 mm) and Tom Thumb (15 mm) sized taps (inner socket dimension)

Material: Lead Free Brass (Chromed Handles)

Water Pressure: 1.2 – 8bar. (Suitable for low pressure water systems).

Water Temperature: Max 192 degree F / 89 degree C

[2] NEERR^{TM} is a product innovated by ZeFi Labs with RETAS as Marketing Partner
[3]It is a patent pending technology by ZeFi Labs

Foam taps

Conventional taps are used in the hand wash areas which results in large quantity of fresh water. Foam taps are a better fit in these high consumption areas. They consume 25-30% less than the conventional taps.



Photographs: Foam taps

Spring loaded Push taps

Spring loaded push type tap is an alternate device for minimizing hand wash Water. The spring-loaded push taps operate with the simple mechanism of pressing the knob for water. The knob automatically released back to close position in 5-7 seconds. This saves about 30-40% of water compared to the conventional taps



Photographs: Spring loaded push taps

Low flush cistern

The latest model closets are water efficient and operate in dual mode with single flush releases 2 liters and dual flush releases 4 liters per flush. This results in large quantity of water savings.



Photographs: Low flush cisterns

Annexure VIII: Suggestive List of Vendors for providing water saving equipment/technology/consultancy

a. Supplier Addresses of Water & Wastewater Treatment Systems and Water Saving Devices

1. Hitech Enviro Engineers & Consultants Pvt. Ltd.
Address: Plot No : A-1, Ground Floor,
Kaushambi, Ghaziabad – 201010
Tel: 0120– 4294461-63,
Fax: 0120- 4294462
Email: projects@heecpl.com
Website: www.heecpl.com
Contact Person: Mr. Hitesh Mittal (Director)

2. Arvind Envisol Ltd.,
Address: Naroda Road, Ahmedabad,
Gujarat-380025
Tel: 079 30138000
Fax: 079 30138677
Email: ashini.shah@arvind.in
Website: www.arvind.com
Contact Person: Mr Ashini Shah

3. GE India Industrial Pvt. Ltd
Address: Building No 7A, 5th Floor DLF Cyber City,
DLF Phase III, Sector 25A, Gurgaon
Haryana – 122002
Tel: 0124 4808016
Mobile: 09999907981
Email: himanshu.gupta@ge.com
Contact Person: Mr Himanshu Gupta

4. Genesis Membrane Sepratech Pvt. Ltd
Address: No18, Vardhaman Complex
No 10, L.B.S Marg, Vikhroli (West)
Mumbai – 400 083
Tel: 022-5775456 / 5775458
Fax: 022-5790608
Mobile: 9322229520
Email: genesis@bom5.vsnl.net.in
Contact Person: Dr BibhashChakravorty

5. **Ion Exchange India Ltd**
   Address: Block B, Flat No.8, Local Shopping Center
   Ring Road, NarainaVihar
   New Delhi - 110 028
   Tel: 011 2577 1160/0862/6061/6065
   Fax: 011 2577 4837
   Email:delcro@ionexchange.co.in

6. **Jindal Water Infrastructure Ltd**
   Address: Jindal ITF Centre, 28 ShivajiMarg, New Delhi 110015
   Telephone: 011-45021983, 45021984
   Fax: 011-45021982
   Email: info@jindalaquasource.com
   Website: www.jindalaquasource.com
   Contact Person: Mr SudhirMalhotra, Sr Vice President

7. **Doshi Ion Exchange & Chemical Industries Limited**
   Address: C – 147, Madhuban
   Near Universal Public School
   New Delhi 110092, India
   Tel: +91-11-22502064 / 22022175
   Fax: +91-11-22044979
   Email: delhi@doshion.com

8. **Max Pure Water Systems**
   Address: Near Bharat Petrol Pump,
   Opposite Bharat Cancer Hospital,
   Kumbharia Road, Saroli, Surat. Gujarat
   Telephone: 0261-264 3894
   Fax: 0261-264 0034
   Mobile: 98980 43960, 98980 41900
   E-mail: maxpurero@gmail.com; info@maxpurero.com
   Website: www.maxpurero.com
   Contact Person: Mr. Kailash Shah, Director

9. **Chempure Technologies Pvt Ltd**
   Address: 28/1, Manjolai 2nd Main Road
   Kalaimagal Nagar Extn., Ekkaduthangal
   Chennai – 600097
   Tel: 044-22250173 / 22250162
   Fax: 044-22250867
   Mobile: 9444076114
   Email: chempure@vsnl.net
   Contact Person: Mr Leo Vino

10. **Pentair Water India**
    Address: L/52-55, Verna Industrial Estate
    Verna, Salcette
    Goa – 403 722
    Tel: 0832-2883300
    Fax: 0832-2883312
    Contact Person: Mr MritunjayChaubey

11. **Nuchem Weir India Limited**
    Address: E-46/12, Okhla Industrial Area,
    Phase - II , New Delhi - 110 020
    Tel: 26385737, 26383234, 26384656
    Fax: 51611846
    Manager-Water Treatment
    Email: msakhtar@nuchemweir.com
    Contact Person: Mr M.S.Akhtar

b. <u>Flow Meters (Fixed/Portable)</u>

1. **Forbes Marshall Pvt. Ltd.**
   Address: A-34/35, MIDC, H Block,
   Pimpri, Pune-411018, Maharashtra
   Telephone: 020-2744 2020
   Fax: 020-2744 2420, 2040
   Mobile: 98505 67714
   E-mail: rmishra@forbesmarshall.com
   Website: www.forbesmarshall.com
   Contact Person: Mr Rakesh Mishra,
   Head - Water Business

2. **Iota Flow Systems Pvt Ltd**
   Address: A-2/13 Phase II ,Industries Area,
   Maya Puri, New Delhi - 1100 064
   Tel.: 91-11-46254601-08 Extn 17
   Moblie: 09958609393
   Fax: 91-11-46880020
   Email: sunil@iotaflow.com
   Contact Person: Mr Sunil Yadav

3. **GE India Industrial Pvt. Ltd**
   Address: Building No 7A, 5th Floor DLF Cyber City,
   DLF Phase III, Sector 25A, Gurgaon
   Haryana – 122002
   Tel: 0124 4808016
   Email: Srikanth.Kommu@ge.com

Contact Person: Mr Srikanth Kommu

4. **Rockwin Flowmeter India Pvt Limited**
   Address: B-24, Site IV,
   Sahibabad Industrial Area,
   Ghazibad-201010, Uttarpradesh
   Tel: 0120-2895400, 2896286, 2895079
   Fax: 0120-2895450
   Mobile: 9810129687, 9331052312, 9381026604
   E-mail: rajiv@rockwin.com; Mumbai@rockwin.com; rockwinkolkata@vsnl.net; rockwinchennai@vsnl.net
   Website: www.rockwin.com
   Contact Person : Mr Rajiv Prakash

5. **Orbit Technologies Pvt. Ltd.,**
   Address: B-50, Sanathnagar Industrial Area,
   Hyderabad-500018
   Ph: 040-67216354
   Fax: 040-23801579
   Email : orbit@orbitindia.com
   Website :www.orbitindia.com

c. Water Saving Gadgets (e-flush, e-taps, Foam taps, dual flush cisterns & low flow showers)

1. **Hindustan Sanitary ware & Industries Ltd.**
   Address: Tewari House, 2nd Floor, 11 - B / 8
   Main Pusa Road, New Delhi - 110005
   Tele Phone: 011 - 2585 4656
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Annexure IX: Guidelines for installation of Flow meter on Borewells

Digital Water Flow Meter with Telemetry for Groundwater extraction monitoring as per CGWA notification

Technical specifications

1. Specification of Tamper proof Electronic water meter with telemetry

Metering Technology	: Ultrasonic or Electromagnetic
Communication type	: LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G)
Tamper proof:	
a) Power source	: The meter shall be battery operated or UPS powered supply with provision of power OFF detection. The telemetry system units shall be battery operated or through external power supply. The metering data should be stored in the meter even if the telemetry system is off due to power failure.
b) Sealing	: The meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
Compliance	: The meter shall preferably be manufactured as per ISO 4064: 2014 Standards and shall have IP 68 ingress protection.
Accuracy	: The meter shall be of accuracy better than ± 2% for the operating flow range (from 10 % to 100 % of maximum flow rate).
Test certificate	: The meter manufacturer shall submit the latest test/calibration certificate of the meter, from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL) or any third party laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), for every meter.
Parameters to monitor	: The meter (since installation of the requisite water meter) shall transmit the following parameters to a

	secure cloud • Timestamp • Cumulative forward flow volume • Cumulative reverse flow volume • Cumulative Net volume • Cumulative pump working hours • Meter serial number • Device last calibration date • Borewell id (Provided by CGWA)
Cloud	: The Communication / telemetry data should be directly captured in a secure cloud. The cloud service provider should be empaneled with The Ministry of Electronics and Information Technology (MeitY).
Transmission frequency	: The data shall be transmitted minimum 2 times in a day
Battery life	: In case of battery operated meters the battery shall run at least for a period of 3 years with 2 transmissions per day. The battery shall be replaceable without any data loss.
Data acquisition	: The meter shall be supplied with complete AMR / AMI system with Data Management software. The Data Management Software must be capable of running on a standard PC. The Data Management Software should be cloud based and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.
Real-time data to CGWA	: The un-tampered data from the secure cloud shall be sent to Central Ground Water Authority (CGWA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.

2. Installation of meter

Location	: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure. 1
Bypassing	: There shall be no bypassing of pipe prior to the installed flow meter.
Full flow	: The installation of the meter shall ensure the pipe shall have full of water at all times. Sufficient upstream and downstream straight length shall be provided for the meter (Refer to Figure 1.)

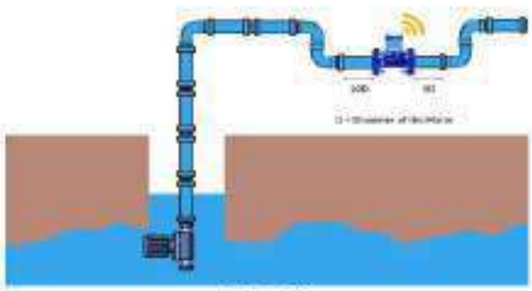


Figure. 1
Installation position of tamper proof flow meter with telemetry at groundwater abstraction structures.

3. DETAILED TECHNICAL SPECIFICATIONS OF AMR / AMI WATER FLOW METERS

3.1 Specification of flow meter

Flow meters shall meet the following metrological specification:

Turndown ratio of 10 or above
Accuracy ± 2%
Technology: electromagnetic or ultrasonic

3.1.1 Size:

1. DN40 - Flow range: 0.5 lps to 5 lps
2. DN100 - Flow range: 3 to 30 lps
3. DN150 - Flow range: 13 to 130 lps

Meter performance shall not get affected by external magnetic field, as specified in ISO4064.

Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.

3.1.2 Material of Construction:

The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per applicable standards (referred above).

- The water meter and accessories shall be manufactured from materials of adequate strength and durability.
- The body of the meter shall be of Brass/Bronze/MS/CI/SS/Engineering Plastic and compact enough to avoid tampering of meter. The manufacturer shall specifically mention in the offer, the material used in manufacturing.
- The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste, odor or discoloration in the water supply.
- The painting material used should be free from toxic constituents and safe for human uses and should not affect human health (Health Certificate should be attached/provided).
- Each meter should be supplied in separate individual box with its accessories, test/ calibration Certificate (for accuracy parameter) and Guarantee Card for free repair/replacement during the warranty period.

3.1.3 Markings on the Body of the Meter:

- Make/Brand, Size / Nominal Dia.
- Sl. No. / Year of Manufacture, Metrological specifications etc.

3.1.4 Meter indicator

The digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.

- It shall be of straight reading type
- No. of digits and verification scale interval shall be as sufficient enough to meet the required accuracy.
- Totalizer shall be made of suitable material required to maintain IP 68 protection class.

3.2 Telemetry System

- The AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering etc. along with necessary alarms.
- The system will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.
- The battery shall be replaceable without any data loss.
- The meters should report an alarm to the server as and when tampered.
- All Water Meter readings should be time stamped.
- The meter should have the capability to detect and record reverse flow separately.
- The meter should be capable of to detect Leak, Zero (No) Flow, High Flow.
- The AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The AMR/AMI should function even in the presence of high voltage power lines.
- Battery usage has to be indicated at the server. Provision should be provided to replace batteries if required.
- The communication shall be encrypted to avoid tampering.
- The meter should be configurable either using the DTU or from the server.
- Loss of communication should be indicated in the server within 48 hours.
- The meter should be able to log the daily flow data with a timestamp which is supposed to be sent to the cloud via telemetry for at least 2 years.
- In case the telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.
- This data shall also be used for retrieval in case of any dispute between meter data and online data.

3.3 Data Management Software

• The web based Data Management Software must be capable of running on a standard PC compatible with minimum Pentium Processor; in addition, the software must run under Windows XP Professional, Windows Vista, Windows 7 and / or latest version of Windows Operating System and HP Unix, Linux, Solaris, etc.

- The Data Management Software should be cloud base and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.
- The Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email/SMS to the user.

- The Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.
- The Data Management Software should be able to display all kind of data on screen at any time.
- The Data Management Software should have capability to add additional customer information and create customizable data fields.

3.4 Lab Testing / calibration:

Testing or Calibration of meters shall be performed at ISO 17025: 2017 accredited laboratory. The accuracy of meter shall be within ± 2 % in the operating range. The meter shall have valid model approval certificate.

The meter shall have model approval from India or abroad. Every meter should be calibrated / tested for accuracy in the operating flow range (10% to 100%). At least 4 point calibration at 10%, 40%, 70% and 100% of maximum/rated flow shall be performed.

Confederation of Indian Industry

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WATER AUDIT REPORT

As per the guidelines of CGWA

MINISTRY OF JAL SHAKTI

At

Bajaj Energy Limited, Khambharkhera, Lakhimpur, Uttar Pradesh

Prepared by

Confederation of Indian Industry
CII-Triveni Water Institute

April 2022

Water Audit Report
Bajaj Energy Limited, Khambharkhera, Lakhimpur

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We would like to convey sincere thanks to Mr. Santosh Srivastava for providing an opportunity to undertake the water audit study at 5 units of Bajaj Energy Limited.

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CII- Triveni team is indebted to the Engineering Department of BEL, Khambharkhera for showing keen interest in the water audit and the wholehearted support and cooperation during the conduct of the field study, without which the study would not have steered to its successful completion.

It is well worthy to mention that the efforts being taken, and the enthusiasm shown by all the personnel towards water conservation are really admirable.



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Abbreviations

MGF	Multi-Grade Filter
DMF	Dual Media Filter
UF	Ultrafiltration
RO	Reverse Osmosis
ERS	Effluent Recovery System
CGWA	Central Ground Water Authority
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
ETP	Effluent Treatment Plant
IMD	Indian Meteorological Department
LPCD	Liter Per Capita Per Day
RWH	Rainwater Harvesting
SAC	Strong Acid Cation (DM plant unit)
SBA	Strong Base Anion (DM plant unit)
STP	Sewage Treatment Plant
WTP	Water Treatment Plant

Executive Summary

Bajaj Energy Limited, Khambharkhera, District Lakhimpur, Uttar Pradesh division is a coal based thermal power plant. It is situated in Lakhimpur District of Uttar Pradesh. It is spread across an area of 54.62 acres including Plant, ETP, New Coal yard & Ash Dyke. There are 3 borewells installed inside the plant area. The wastewater generated in the plant is treated in the common effluent treatment plant. The treated effluent from this ETP is used for various activities like firefighting, ash handling, dust suppression and gardening. The specific water consumption for the plant is 3.05 m^3/MWh of power generated (April 2021 – March 2022).

Currently, the plant had a consent to withdraw 21,06,000 m^3/annum of water from 3 nos. borewells located within the plant area vide Registration no. 202106000284, 202106000377, 202106000500 valid up to 24/07/2026 and application no. LMPK0621RIN0033, LMPK0621RIN0034 & LMPK0621NIN0024 from 3 borewells available inside the plant. At present, approximately 4318.38 m^3/day (average of April 2021 – March 2022) of water is used for the plant operations as against the permitted quantity of 7020 m^3/day. The plant has installed two piezometers with digital water level recorder and at four locations manual piezometers is used for water level monitoring inside the campus in compliance of the conditions mentioned in the NOC issued to them by Ground Water Department, Ministry of Jal Shakti, Government of Uttar Pradesh.

The plant has installed electromagnetic flow meters on all the three borewells and also on the common header of the borewells. Electromagnetic Flowmeters have also been installed at other locations like Boiler Feed, RO Reject, ETP Outlet, domestic water consumption etc.

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 60.26% which puts Lakhimpur district in the category of safe zone.

Given the above scenario of prevailing resource challenge, accelerating over time the management of Bajaj Energy Limited is very keen to do water audit of their premises. To get benefit of water saving projects, management of Bajaj Energy Limited awarded the task of water audit of its premises at Khambharkhera, District Lakhimpur, Uttar Pradesh to CII Triveni Water Institute.

The audit is focused on improving water usage efficiency and identifying water conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by CII team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis.

Summary of Water Audit findings are presented in the following table shown below:

I	**Total Fresh Water Intake (Average)**	**4318.38 m^3/day**		
II	**Savings Achievable**	**102.4 m^3/day**		
	Water Saving Potential (%)	**2.3 %**		
Recommended Projects				
S.No.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	2.4	0.045	0.2
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	9.13	20
Observations				
1	Significant drift loss was observed in the cooling tower			
2	No smooth platform was present along the boundary of cooling tower sump			

- Water balance across the plant has been successfully achieved. Total consumption- Bore well: 4318.38 m^3/day (average of April 2021 – March 2022)
- Strategies identified for reduction, reuse and recycle show:
  - Collection and Reuse of supernatant MGF backwash water after settling in a settling tank
  - Installation of RO plant for treatment of ETP treated effluent and reuse in cooling towers
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.
- Internal audits to be undertaken at BEL, Khambharkhera (every year); third party audits also recommended.

1. Introduction and background

1.1 Introduction

Water is a core element of natural capital, underpinning many business activities. Water risks cut across most industry sectors. As per the World Economic Forum Global Risks report, water crisis is the third most impactful global risks to business (WEF 2017). The risk continues to rise given the increasing demands and rising pressures. Safeguarding water and ensuring its availability in sufficient quantity and quality is therefore subject of vital interest to business.

Bajaj Energy Limited deals in generating coal-based power for UPPCL. They have an installed capacity of 2x45 MW power plant.

The present study focuses on BEL, Khambharkhera unit for water audit at the plant level that would help in identification of appropriate water management and conservative strategies to minimize the risks to operations.

The first step towards efficiently managing and conserving water resources is monitoring and mapping water consumption under various processes. This involves conducting a regular water audit that identifies and quantifies water uses and losses from a water system.

A comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions.

Good initiatives taken by the plant

- Monitoring system for flow by installation of electromagnetic flow meters at borewells and other strategic locations, mechanical flowmeters installed at other locations such as pump house, cooling tower blow down etc.
- No fresh water is used for horticulture.
- The ETP treated water is used in various applications like gardening, ash handling, dust suppression and firefighting.
- The ETP treated water is used for Firefighting in the entire plant.
- Rainwater harvesting pits have been constructed for recharge of ground water collected from paved road and sideways.
- SWAS panel water is being collected and used as cooling tower makeup.

2. Scope

The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Khambharkhera.

Scope of work of the study includes the following:

- Study of water sources (size, capacity, quantity, quality)
- Existing water distribution system, associated losses, Wastewater discharge points across the process and Identification of water
- consumption of each existing meter/sub-meter
- Quantification of water distribution network in each section
- Mapping of raw water, process, recirculating water, cooling & domestic, recycling & effluents
- Segregation and collection of waste streams based on quality and quantity
- Study of various treatment & disposal schemes deployed in the plant
- Identification and Recommendations of projects based on reduce reuse & recycle on water Conservation
- On-site discussion with facility manager and personnel
- Monitoring and measurements using pressure and flow meters and various other devices as and when required
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Water system analysis and Quantification of baseline water map
- Developing Water consumption and wastewater generation pattern
- Evolving value added "cost of water" at various water use locations
- Identification of "branch flow unbalancing" at multi-cell cooling tower & associated losses in cooling tower efficiency & high drift losses
- Calculation of Rainwater Harvesting Potential for the site
- Estimating Specific water use and conservation potential
- Evolving recommendations/schemes for improvement in water and wastewater management system With Cost
- Recommendations for reduction in water consumption particularly in two conditions
    - Plant Stoppage Condition

  - Plant Running Condition
- Checking the compliances of all conditions/requirements as stipulated by government authority such as CGWA, MOEF etc.

3. Methodology of the Study

A team of two engineers were involved in carrying out the study. The study methodology involved the following steps:

- Preliminary discussions with plant personnel and observations in all water consuming areas
- Data collection through discussions, past records, specifications
- Identification of water conservation options on short, medium & long terms
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion, and submission of report to the management

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of portable instruments for carrying out various measurements and analyses. CII has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support water audit investigations and analyses. The specialized instruments that were used during the water audit include Ultrasonic water flow meter.

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

4. Assessment of Present Water Usage

4.1 Plant Water Consumption Trends

The source of water to the plant is borewell. Borewell water is majorly used for cooling and production applications after suitable treatment in water treatment plant. Borewell water is also utilized for domestic purposes. The figure below indicates the water consumption trend from April 2021 – March 2022. The uneven water consumption trend could be noticed because of the plant gets instructions from UPPCL for shutdown based on load requirements.

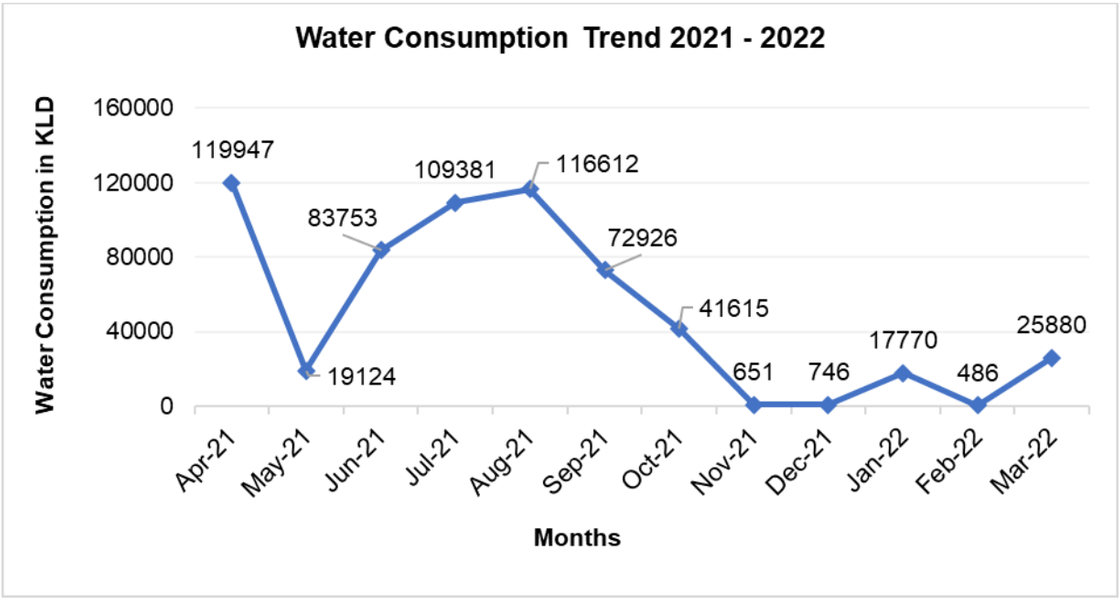


Figure 4.1: Water Consumption Trend April 2020 – March 2021

Specific Water Consumption

The specific water consumption is 3.05 m^3/MWh based on the data (April 2021 – March 2022) provided by the BEL, Khambharkhera team.

4.2 Water Sources

The source of water to the plant is borewells. The plant has 3 borewells within its premises. Raw water is majorly utilized for cooling tower makeup and producing DM water which is utilized for feed to the Boiler. The average daily water consumption through borewells is 4318.38 m^3/day (April 2021 - March 2022).

The total water consumption for past three calendar years is as follows:

Table 4.1 Water consumption trends for past 3 years

Year	FY 2019 - 2020	FY 2020 - 2021	FY 2021 - 2022
Water Consumption (m^3/year)	255244	543599	608891

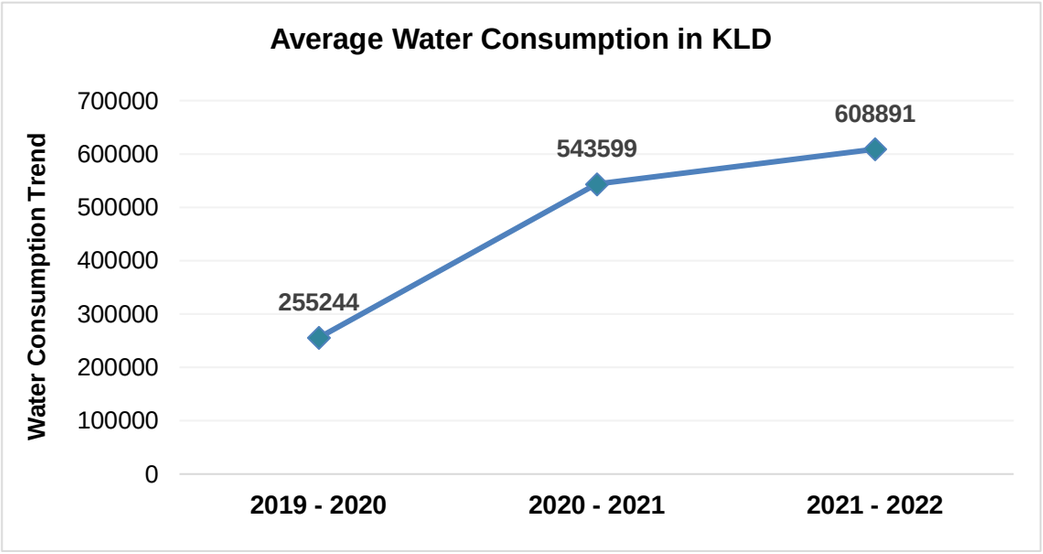


Figure 4.2: Water Consumption Trend in KLD

The running hours of borewell range from 7-18 hours depending upon requirement.

The detailed description about the water source is provided below in the tabular form in table:

Table 4.2 Borewell Details

S.No.	Description	Depth (ft)	Pump H.P	Pumping capacity (m^3/h)
1	Borewell-1	110	25	180
2	Borewell-2	110	25	180
3	Borewell-3	110	25	180

Rainfall Pattern in last 5 years as per IMD

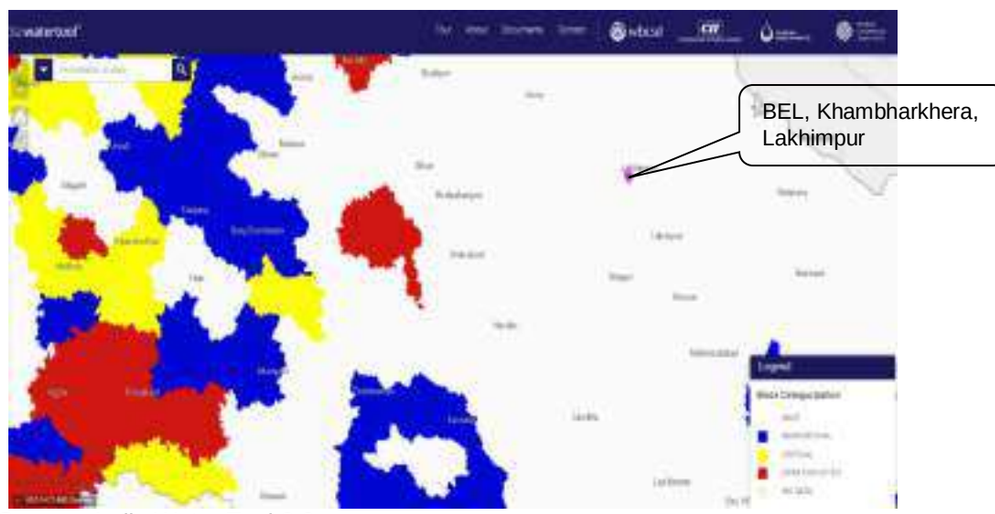
Total rainfall received at Lakhimpur district, based on IMD datasets shows that average rainfall is around 956.3 mm. The rainfall varies between 787.87 mm to 1663.29 mm in last 5 years (2017 to 2021).

Table 4.3 Average annual rainfall (mm) in last 5 years as per India WRIS[1] data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	31.9	0.06	10.12	1.57	66.88	96.48	307.13	325.05	127.66	11.55	0	0	978.4
2018	4.63	8.55	0.17	20.87	11.45	89.94	479.18	499.89	63.37	1.02	0.03	0	1179.1
2019	7.34	47.51	8.9	1.87	1.2	91.72	376.54	85.28	94.91	0.25	1.86	70.49	787.87
2020	37.48	35.09	51.69	6.54	48.68	148.37	208.55	258.02	99.58	0	3.31	0	897.31
2021	1.68	0.88	0	4.9	137.86	377.98	370.68	380.92	188.64	194.71	0	5.04	1663.29
												Average Annual Rainfall	**1101.194**

Groundwater situation at the plant site

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is **60.26%** which puts Lakhimpur district in the category of safe zone.



Source: India Water Tool 3.0

Figure 4.3 Groundwater Block Categorization of Khambharkhera, Lakhimpur district

[1] Source: India-WRIS (indiawris.gov.in)

As per the India water tool the block lies in High (40-80%) baseline water stress zone. Higher value indicates that there is more competition among users related to water for domestic, industrial, agriculture and other purpose



Source: India Water Tool 3.0

Figure 4.4 Baseline Water Stress of Lakhimpur District

4.3 Water Supply & Distribution Details

The water extracted from any of the 3 borewells is pumped through a common header line to the cooling towers, inlet to DM plant and for domestic water utilization. The major water consumer in the unit is the cooling tower.

For generation of DM water, the raw water from the borewells is first fed to a Multi Grade Filter (MGF) followed by a 2 stage RO system of 16 m^3/h (inlet) Capacity. The RO- permeate generated is fed to the DM plant which consists of Strong Acid Cation (SAC) followed by Strong base Anion (SBA) followed by Mixed Bed (MB). The reject from the RO and regeneration from the SAC, SBA & MB go to the N-pit. The DM water generated post MB is stored in 2 nos. DM water storage tank of capacity 250 m^3. The DM water is used as feed to the boiler.

4.4 Water Balance

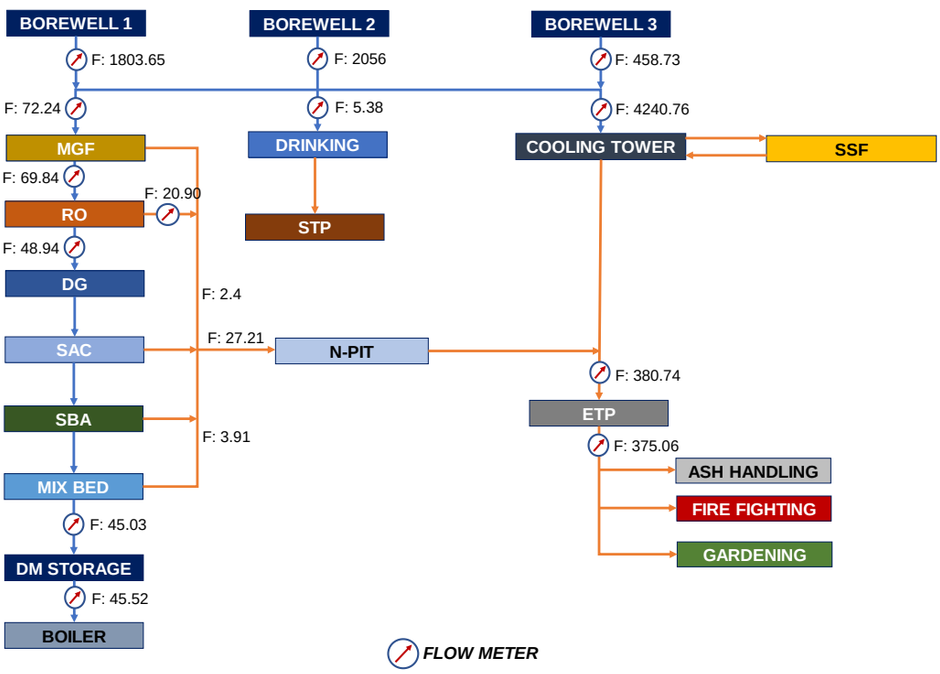


Figure 4.5 Water Distribution network diagram

NOTE: This balance has been prepared on average of the data from FY 2021 – 2022

Overall plant water balance is shown below in tabular form in table 4.4

Table 4.4 Overall Water Balance (Daily Average)

Fresh water Balance			
Sno.	**Description**	**Quantity (KLD)**	**Remarks**
1	Inlet from BW-1	1803.65	FM reading
2	Inlet from BW-2	2056	FM reading
3	Inlet from BW-3	458.73	FM reading
	Total freshwater Inlet	**4318.38**	
Fresh water Distribution			
4	Inlet to DM Plant	72.24	FM reading
5	For Domestic Water Consumption	5.38	FM reading
6	As Cooling Tower Makeup	4240.76	Calculated value
	Total Fresh Water Distribution	**4318.38**	
DM Plant water balance			
7	Inlet to MGF	72.24	
8	MGF Backwash	2.4	
9	RO Inlet	69.84	
10	RO Reject	20.9	
11	Inlet to DM Plant SAC	48.94	
12	SAC, SBA & MB Regeneration	3.91	Calculated Value
13	DM water feed to Boiler	45.52	

4.5 Domestic water Consumption

Present domestic water consumption is 5.38 m^3/day (based on flowmeter readings). Domestic water consumption in the plant is accounted for applications like drinking, hand wash and toilet flushing.

The water supply and usage patterns were discussed with plant personnel and the observations are as follows:

- Separate meter is installed for measurement of domestic water consumption for the Plant.
- Water closets in plant are of western type with single flush type. However, the size of cisterns are large.

- ❖ Handwash taps in the plant are normal bib taps.
- ❖ Canteen is not present in the plant

❖ Total number of consumers (Permanent+ workers+ Visitors) = 296
❖ Water Consumption = 5.38 m^3/day
❖ Per capita Consumption = 18.17 LPCD

As per CGWA gazette notification, the recommended domestic water requirement is 30 LPCD

The domestic water consumption is within the limit as prescribed by CGWA for domestic water consumption.

4.6 Rainwater Recharge & Harvesting

During the water audit study of the plant, it was found that plant is practicing the rainwater recharge by means both rooftop and paved area drainage through storm water drainage network.

Rainwater harvesting potential is the total amount of rainwater that can be harvested from a given site throughout the year. It can be calculated using the following formula:

Rainwater Harvesting Potential (KL) =
Catchment Area (sq.m.) x Average Annual Rainfall (m) x Run-off Coefficient

Average Annual Rainfall for Lakhimpur = 1101.94 mm

The following table summarizes the total rainwater harvesting potential from the plant:

Table 4.5 Rainwater Recharge potential

Description	**Area (m^2)**	**Runoff coefficient**	**Annual Rainfall (mm)**	**RWH Potential (KL)**
Rooftop area (m^2)	4104	0.85	1101.94	3844.0
Paved Area (m^2)	46400	0.65		33234.5
Green Area (m^2)	37800	0.15		6248.0
Unpaved area (m^2)	176000	0.15		29091.2
Total				**72417.7**

It can be seen from the table above that there exists rainwater harvesting potential of 72417.7 KL throughout the plant.

4.7 Water Metering & Monitoring System

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. The presence and regular monitoring of flow meters ensures that the flows in the plant are well accounted. During the audit, the available flow meters were identified, and their working conditions were checked. The plant has installed flowmeters at various strategic locations, the flowmeter readings in comparison with ultrasonic flow meter readings have been detailed in below table.

Table 4.6 Comparison of instantaneous flow meter readings

S. No	Metering Locations	BEL	CII	% Age Error
1	Borewell 1	147	141.2	-4.11
2	Borewell 2	133	127.4	-4.40
3	Borewell 3	108	125	13.60
4	DM Inlet	13	12.4	-4.84
5	DM Outlet	11	10.7	-2.80
6	RO1 Inlet	15	16.7	10.18
7	RO1 Outlet	NA	11.6	
8	RO1 Reject	4.3	4.2	-2.38
9	RO2 Inlet	15	17	11.76
10	RO2 Outlet	11.8	11.3	-4.42
11	RO2 Reject	4.7	4.2	-11.90
12	ETP Inlet	36	35	-2.86
13	ETP Outlet	41	40	-2.5
14	Cooling Tower Makeup	NA	272.3	
15	Cooling Water Pump	NA	6370	

4.8 Water Costing

The cost of the different types of water is illustrated given below in table:

Table 4.7 Water Cost

S. No.	Description	Total Cost (Rs./m^3)
1	Borewell Raw Water Cost	5

5. Water & Wastewater Treatment Practices

This section provides the detailed analysis of the data along with the key findings.

The effluent generated from the plant is treated in an Effluent Treatment Plant (1000 KLD) and the treated effluent is used for gardening, ash handling, dust suppression, firefighting etc.

Table 5.1 Wastewater Discharge Status (Daily Average)

S. No.	Description	Quantity (KLD)	Mode of Disposal
1	Cooling Tower Blowdown	353.53	Effluent Treatment Plant
2	MGF Backwash	2.4	
3	RO Reject	20.9	
4	SAC Regeneration	3.91	
5	SBA Regeneration		
6	MB Regeneration		

5.1 Raw/Fresh water Treatment

The water from all three borewells is supplied to the Water treatment plant. The treatment plants consist of MGF, and RO system followed by DM plant. Though they have installed softener, but at the time audit it was not operational and as per inputs from the plant team the softener is not being used at all. The water after passing to the RO system, goes to the DG, SAC, SBA and MB. The DM water generated post MB is stored in DM water storage tank of 250 m^3. The wastewater from the MGF backwash, RO Reject, and DM plant regeneration is collected into the N-pit from where it is sent to the ETP plant for further treatment.

For cooling purpose, water is being fed through these three borewells into the cooling towers and its blowdown water is sent directly to the ETP after mixing with the N-pit discharge water. These borewells also meet the requirement for domestic purposes primarily for drinking purposes.

A schematic of the raw water treatment system inside the plant is shown below:

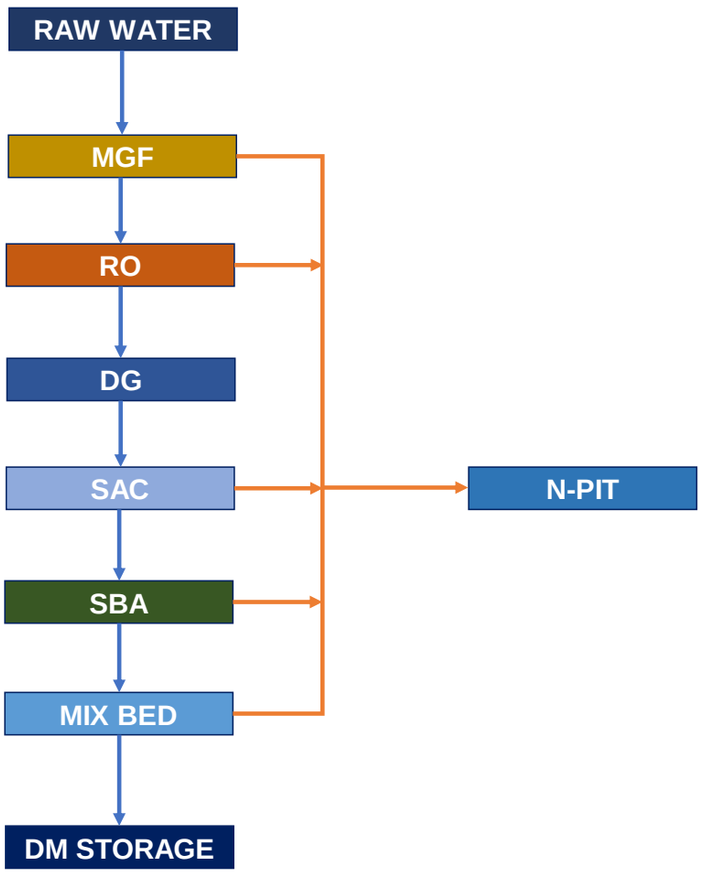


Figure 5.1: Schematic diagram of water treatment system

5.2 Waste Treatment & Disposal

The schematic of wastewater treatment and disposal is shown below

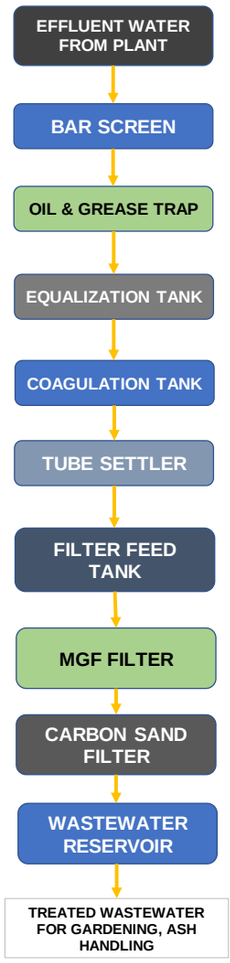
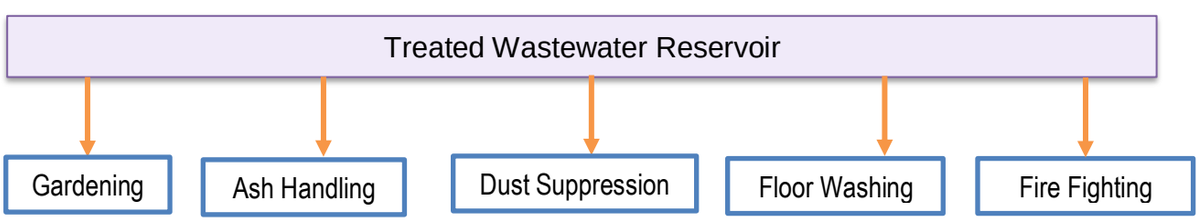


Figure 5.2 Schematic of Effluent Treatment plant

The treated water from the ETP is used for various secondary activities such as gardening, ash handling, dust suppression and floor washing.



5.3 Sewage Treatment

The plant has installed a Sewage treatment plant of 100 KLD capacity inside its township.

5.4 Environmental Compliance related to Water

- BEL, Khambharkhera is currently extracting 4318.38 m^3/day (April 2021 – March 2022) against a permission of 7020 m^3/day.
- Plant has installed Electromagnetic flow meters at all the 3 borewells and at remaining locations Electromagnetic/ mechanical flow meters have been installed.
- 02 nos. Piezometer with Digital water level recorder and at four locations manual piezometer is used for water level monitoring in the campus in compliance of the NOC conditions. The piezometers with DWLR support telemetry.
- As per the NOC issued by Ministry of Jal Shakti, Government of Uttar Pradesh the plant has to adopt rainwater harvesting/ recharge in the project premises. 2 nos. rainwater harvesting pits have also been constructed within the campus to collect rainwater from the paved roads and cemented sideways.
- Ground water quality is being regularly monitored through inhouse laboratory and the samples are also sent to NABL accredited lab for testing. The reports have been attached along in annexures.
- As per UPPCB Consent order, the domestic sewage generated within theplant premises should be treated in a sewage treatment plant. A sewage treatment plant of 100 KLD has been installed in the township and domestic wastewater is routed here for treatment.

6. Water Conservation Opportunities

6.1 Water Saving Proposal 1: Reuse of filter backwash (MGF) water after settlement in a settling tank

6.1.1 Present Status

Presently the MGF backwash being generated from the Multi Grade Filter is being discharged into the common drain which goes to the N-pit.

The schematic of the present system is shown below:

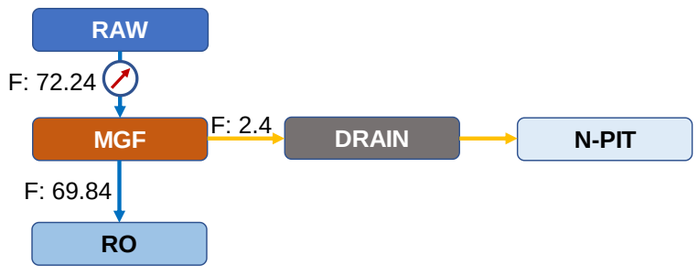


Figure 6.1: Schematic of present system of MGF Backwash

6.1.2 Recommendation

It is recommended to reuse the backwash water from the MGF and instead of sending it to the N-pit, the filter backwash should be stored in a settling tank to store water and allow for settlement of the supernatant particles. This backwash water does not have any impurities except for suspended particles and after settlement, the supernatant water quality will be equivalent to the raw water quality.

The schematic of the proposed system is shown below:

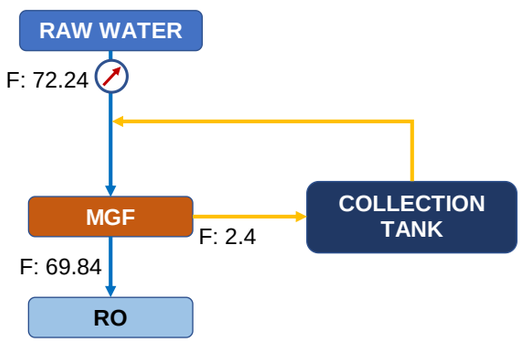


Figure 6.2: Schematic of proposed system of MGF Backwash

6.1.3 Benefits

The fresh water saving potential of about 2.4 m^3/day with cost benefit analysis as below.

Table 6.1 Cost – Benefits: Reuse of filter backwash (MGF) water after settlement in a settling tank

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 0.20/m^3**
Daily water savings	m^3/day	2.4
Annual water savings	m^3/year	876
Annual cost Savings	Rs. Lakhs	0.045
Investment Required	Rs. Lakhs	0.2
Payback	Year	4.4

*Calculated for 365 working days

6.2 Water Saving Proposal 2: Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup

6.2.1 Present Status

Presently the ETP treated water is being used for low end applications such as Ash handling, Gardening, Coal yard dust suppression, sprinkling on road etc. This water has great potential to reduce the freshwater makeup to the cooling tower.

The water reaching the ETP comprises of mostly cooling tower blowdown and water from the N-pit which is a combination of DM plant regeneration and MGF backwash.

6.2.2 Recommendation

It is recommended to install a 3 stage RO system with MEE system to treat excess ETP treated water which presently is being used for gardening.

The capacity of the RO should be 105 KLD or approximately 10 KL/h considering 10 hours working. The overall recovery of the system will be 95% and the remaining 5% would get converted to salt through MEE.

6.2.3 Benefits

The fresh water saving potential of about 100 m^3/day with cost benefit analysis as below.

Table 6.2 Cost – Benefits: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 0.20/m^3**
Daily water savings	m^3/day	100
Annual water savings	m^3/year	36500
Annual cost Savings	Rs. Lakhs	1.8
Investment Required	Rs. Lakhs	100

7. Implementation Plan

To better understand and comprehensively assess the water usage in the various processes and explore possibilities of water saving, Bajaj Energy Limited and CII- Water Institute partnered to undertake a detailed water audit of the plant.

The previous chapter detailed out the water saving proposals along with the key recommendations and, costs and benefits to the plant from their adoption. This chapter summarizes the key points emerging along with the way forward towards formulation of a Water Efficiency Plan.

The summary of total water savings emanating from proposed water saving proposals is shown in table 7.1.

Table 7.1 Water saving projects: summary for recommendations

I	**Total Fresh Water Intake (Average)**	**4318.38 m^3/day**		
II	**Savings Achievable**	**102.4 m^3/day**		
	Water Saving Potential (%)	**2.3 %**		
Recommended Projects				
S. No.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	2.4	0.045	0.2
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	1.8	100
Observations				
1	Significant drift loss was observed in the cooling tower			
2	No smooth platform was present along the boundary of cooling tower sump			

7.1 Conclusions

7.1.1 Conclusion 1

Water balance across the plant has been successfully achieved
Total consumption: 4318.38 m^3/day (Daily Average)

7.1.2 Conclusion 2

Strategies identified for reduction, reuse and recycle show:

- Around 2.3% saving can be achieved.
- Reduction in freshwater makeup for the cooling tower high potential to reduce overall groundwater withdrawal

7.1.3 Way Forward

❖ Prioritize projects

- Priority areas where immediate savings can be achieved include reuse of filter backwash water (MGF) after settlement in a settling tank.
- Installation of a RO system for treatment of ETP treated water has good potential to reduce the cooling tower freshwater makeup.
- Rainwater collection and harvesting is an important project and could be executed.
- Need to adopt schemes for water management and conservation (Recycle, Reuse and Reduce options)
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Monitor proposal-by-proposal

❖ Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.

❖ Internal audits to be undertaken at Bajaj Energy Limited units; third party audits also recommended.

Annexure I: Data Received from Plant Team

Water Consumption data

Water Consumption Data													
S. No.	**Description**	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**
1	**Borewell – 1**	57984	7901	29482	35317	48926	36379	21617	229	111	6764	0	9604
2	**Borewell – 2**	61963	11223	42842	55739	52106	29411	15549	45	0	8514	0	12504
3	**Borewell – 3**	0	0	11429	18325	15580	7136	4449	377	635	2492	486	3772

Steam Generation Data (April 2021 – March 2022)

1	**COC (month average)**	5.00	5.84	5.82	6.52	5.70	6.21	5.80	shut down	shut down	4.06	shut down	4.59
2	**Steam generation**	158374	24182	112448	152564	165172	99882	56642	0	0	24440	0	30632

Piezometer Reading

DATE	TIME	WATER LEVEL (m)	
		GWR00132	GWR00135
31-12-2021	23:00:00	3.04	3.04
30-11-2021	23:00:00	2.94	2.94
31-10-2021	23:00:00	2.46	2.55
30-09-2021	23:00:00	2.93	2.82
31-08-2021	23:00:00	2.74	2.63
31-07-2021	23:00:00	2.68	2.57
30-06-2021	23:00:00	2.12	2.01
30-05-2021	16:00:00	2.31	2.56
30-04-2021	00:00:00	3.94	3.83
31-03-2021	00:00:00	3.87	3.76
28-02-2021	00:00:00	3.68	3.99
31-01-2021	13:00:00	4.29	3.89

Annexure II: Minimum Water Requirement

Annexure-2: Minimum Water Requirement
In view of the Gazette of India Notification Part II- Section 3 – Sub-section (ii) (CG-DL-E-24092020-221952, No. 2941), dated September 24, 2020, " All industries abstracting ground water in excess of 100 m3 /d shall be required to undertake annual water audit through Confederation of Indian Industry (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/PHDCCC certified auditors and submit audit reports within three months of completion of the same to CGWA".
An attempt was made to understand the minimum water required for regular plant operations.
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m3/MWH.
The specific water consumption for Bajaj Energy Limited, Khambarkhera, Lakhimpur is 3.05 m3/MWh of power generated (April 2021 - March 2022) Since the plant was running at less than the full load due to COVID-19 pandemic and coal shortage, approximately 4318.38 m3/day (average of April 2021 - March 2022) of water was being used for the plant operations.
The details of NOC for withdrawal of ground water are as under:

Water withdrawal permission as per CGWA NOC - BEL Khambarkhera, Lakhimpur				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
13	Registration no. 202106000284	972000	KL/Annum	
14	Registration no. 202106000377	756000	KL/Annum	
15	Registration no. 202106000500	378000	KL/Annum	
16	Total water withdrawal NOC	2106000	KL/Annum	
E	**Permissible water withdrawal at 100% load**	**7020.0**	**KL/day**	**300 days working**
F	**Permissible water withdrawal at 70% load**	**4914.0**	**KL/day**	**300 days working**
Condition A: Plant working at 100% load condition				

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
1	Design recirculation rate	17200	m3/h	
2	Actual recirculation rate	**16104**		
3	COC	7		
4	Temperature difference	10		
5	Evaporation loss	5913	m3/day	
6	Drift Loss	77.3	m3/day	considering 0.02%
7	Blowdown	985.6	m3/day	
A	**Total makeup to the cooling circuit**	**6976.3**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
8	Total Staff Strength	210	Nos.	
9	Floating population	90	Nos.	
10	Recommended domestic water consumption	30	LPCD	
11	Total Domestic water consumption	9	m3/day	
12	Considering 15% extra	10.4	m3/day	
B	**Domestic Water Requirement**	**10**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**75**	**m3/day**	

D	**Total Minimum water requirement at 100 % load**	**7061.6**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
13	Cooling tower blowdown	985.6	**m3/day**	
14	Permeate recycled in cooling tower	591.3	**m3/day**	
15	Reject	394.2	**m3/day**	The reject will be used for dust suppression & ash quenching
16	New minimum water demand at 100% load	6470.3	**m3/day**	
17	Saving potential over NOC quantity	7.83%		

Case-2 : Saving potential with COC increased to 9				
18	COC	9		
19	Blowdown	739.2	**m3/day**	
20	Permeate recycled in cooling tower	443.5	**m3/day**	60% recovery
21	Reject	295.7	**m3/day**	The reject will be used for dust suppression & ash quenching
22	New minimum water demand at 100% load	6371.7	**m3/day**	
23	Saving potential over NOC quantity	9.23%		
Maximum saving possible at 100% load is 9.23% over NOC quantity				

Condition B: Plant working at 70% load condition

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
24	Design recirculation rate	17200	m3/h	
25	Actual recirculation rate	11438		
26	COC	7		
27	Temperature difference	10		
28	Evaporation loss	4200.0	m3/day	
29	Drift Loss	54.9	m3/day	considering 0.02%
30	Blowdown	700.0	m3/day	
A	**Total makeup to the cooling circuit**	**4954.9**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
31	Total Staff Strength	210	Nos.	
32	Floating population	90	Nos.	
33	Recommended domestic water consumption	30	LPCD	
34	Total Domestic water consumption	9	m3/day	
35	Considering 15% extra	10.4	m3/day	
B	**Domestic Water Requirement**	**10**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**75**	**m3/day**	

D	**Total Minimum water requirement**	**5040.3**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
36	Cooling tower blowdown	700.0	**m3/day**	
37	Permeate recycled in cooling tower	420.0	**m3/day**	60% recovery
38	Reject	280.0	**m3/day**	The reject will be used for dust suppression & ash quenching
39	New minimum water demand at 100% load	4620.3	**m3/day**	

40	Saving potential over minimum water requirement	**8.33%**		Considering same COC
41	Saving potential over NOC quantity	5.98%		

Case-2 : Saving potential with COC increased to 9				
42	COC	9		
43	Blowdown	525.0	**m3/day**	
44	Permeate recycled in cooling tower	315.0	**m3/day**	
45	Reject	210.0	**m3/day**	The reject will be used for dust suppression & ash quenching
46	New minimum water demand at 100% load	4550.3	**m3/day**	
47	Saving potential over minimum water requirement	**9.72%**		Considering COC of 9
48	Saving potential over NOC quantity	7.40%		

Maximum saving possible at partial load is 7.4%

Annexure III: CGWA NOC for Groundwater Extraction

11/04/2022, 11:43

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)
[See rules 15(2)]
(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)
AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG045173
VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000284			
Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khe	Application Form Serial No.	LMPK3621RIN033
Date of Submission	12/06/2021	Specimen Signature	
Company Name	Bajaj Energy Limited Unit Khambharkhera	Company Address	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DISTLAKHIMPUR
Location Particulars			
District	Lakhimpur Kheri	Block	PULBEHAD
Plot No./Khasra No.	1058 , 1059	Municipality/Corporation	No
Ward No./Holding No.			N/A
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	15/12/2011		
Type of Well	Tube Well/Boring	Depth of the Well (in meter)	110.00
Purpose of well	Industrial	Assembly Size(For Tube Well)	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	H.P. of the Pump	25.00
Operational Device	Electric Motor	Rate of Withdrawal (m^3/hr.)	180.00
Date of Energization (in Case of Electric Pump)		15/12/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	Maximum Allowable Running Hours Per Day:	18.00
Maximum Allowable Annual Extraction of Ground Water:			972000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 25.06.2021		
Against Case			

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

1/3

11/04/2022, 11:44

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)
[See rules 15(2)]
(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)
AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG012934
VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000377			
Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621RIN0034
Date of Submission	17/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Unit Khambharkhera	**Company Address**	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST.LAKHIMPUR
Location Particulars			
District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	15/12/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (in meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/12/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.)	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 26.06.2021		
Against Case			

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

1/3

11/04/2022, 11:41

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)
[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020026
VALID FROM 25/07/2021 TO 24/07/2026
{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000500			
Name of the Owner	DHARMINDER SINGH		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621NIN0024
Date of Submission	23/06/2021	**Specimen Signature**	
Location Particulars			
District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A
Particular of the Proposed Well and Pumping Device			
Date of Construction/Sinking of the Well	15/04/2020		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

1/3

Annexure IV: Drinking water standard IS 10500 (2012)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 3.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydro-carbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

Annexure V: IS 1172: 1993 Code of Basic Requirements for water supply, drainage and sanitation

A general rule the following rates per capita per day may be considered minimum for domestic and non domestic needs:

1) For communities with population up to 20 000 and without flushing system

   a) water supply through standpost — 40 lphd (*Min*)

   b) water supply through home service connection — 70 to 100 lphd

2) For communities with population 20 000 to 100 000 together with full flushing system — 100 to 150 lphd

3) For communities with population above 100 000 together with full flushing system — 150 to 200 lphd

NOTE — The value of water supply given as 150 to 200 litres per head per day may be reduced to 135 litres per head per day for houses for Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions.

4.1.1 Out of the 150 to 200 litres per head per day, 45 litres per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

4.2 Water Supply for Buildings Other Than Residences

Minimum requirements for water supply for buildings other than residences shall be in accordance with Table 1.

Table 1 Water Requirements for Buildings Other than Residences

Sl No.	Type of Building	Consumption Per Day, litres
(1)	(2)	(3)
i)	Factories where bath rooms are required to be provided	45 per head
ii)	Factories where no bath rooms are required to be provided	30 per head
iii)	Hospital (including laundry) :	
	a) Number of beds not exceeding 100	340 per head
	b) Number of beds exceeding 100	450 per head
iv)	Nurses' homes and medical quarters	135 per head
v)	Hostels	135 per head
vi)	Hotel	180 per head
vii)	Offices	45 per head
viii)	Restaurants	70 per seat
ix)	Cinemas, concert halls and theatres	15 per seat
x)	Schools:	
	a) Day schools	45 per head
	b) Boarding schools	135 per head

NOTE — For fire demand in buildings refer IS 9668 : 1981.

4.3 Where only one water-closet is provided in a dwelling, the bath and water-closet shall be separately accommodated.

NOTE — Water-closets, unless otherwise indicated, shall be of Indian style (squatting type).

5.2.2 Dwellings without individual conveniences shall have the following fitments:

a) One water tap with draining arrangement in each tenement,

b) One water-closet and one bath for every two tenements, and

c) Water taps in common bath rooms.

5 DRAINAGE AND SANITATION REQUIREMENTS

5.1 General

There shall be at least one water tap and arrangements for drainage in the vicinity of each water-closet or group of water-closets in all buildings.

5.2 Residences

5.2.1 Dwellings with individual conveniences shall have at least the following fitments:

a) One bath room provided with a tap,

b) One water-closet, and

c) One nahani or sink either in the floor or raised from the floor with a tap.

5.3 Buildings Other Than Residences

The requirements for fitments for drainage and sanitation in case of buildings other than residences shall be in accordance with Tables 2 to 12.

6 WATER SUPPLY, DRAINAGE AND SANITATION REQUIREMENTS FOR RAILWAY PLATFORMS, BUS STATIONS, BUS TERMINALS AND AIRPORTS

6.1 General

The water supply, drainage and sanitation requirement specified in 6.2 to 6.4 for railway stations, bus stations, bus terminals, sea ports

Annexure VI: Groundwater & Wastewater Quality test reports

NOIDA TESTING LABORATORIES
(A Government Approved Testing Laboratory)
(An ISO :9001 : 2015 & ISO 45001 : 2018 Certified Laboratory)
MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & HSPCB Recognized Laboratory
☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-071021-041	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Received On	:	06/10/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	07/10/2021 TO 12/10/2021
Sample Description	:	Ground Water Collected from Ash Pond (Towards Road Side)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.45	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	389	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-071021-041	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/10/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 07/10/2021 TO 12/10/2021
Sample Description : Ground Water Collected from Ash Pond (Towards Road Side)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.45	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	389	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS-3025 (P-55)	<0.01	mg/l	0.03	0.2

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-071021-042	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Received On	:	06/10/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	07/10/2021 TO 12/10/2021
Sample Description	:	Ground Water Collected from Ash Pond Area (Towards Khambarkhera Village)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.12	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	340	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

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2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	38.56	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	23.17	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.23	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.125	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	13.99	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.68	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	28.50	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	188.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	154.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	6.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-071021-043	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	Laboratory (NTL)
Sample Received On	:	06/10/2021
Sample Quantity	:	2.0 Lt.
Analysis Duration	:	07/10/2021 TO 12/10/2021
Sample Description	:	Ground Water Collected from Coal Storage Yard

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.21	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	258	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-037	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	NTL
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.32	-
2.	Total Suspended Solid (TSS)	IS:3025(Part-17):1984	15.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	212.0	mg/l
4.	Biological Oxygen Demand (as O_2) (3 days at 27^{0C})	IS:3025(Part-44):1993	40.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	2.6	mg/l

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-038	12/10/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	NTL
Sample Description	:	ETP Outlet
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No.	Parameter	Test Method	Results	Limit as per CPCB Norms
1.	pH	IS:3025(P-11)	7.12	5.0-9.0
2.	Total Suspended Solid (TSS)mg/l	IS:3025(P-17)	8.8	100
3.	Chemical Oxygen Demand (as O_2) mg/l	APHA 5220 B-2005	56.0	250
4.	Biological Oxygen Demand (as O_2) mg/l	IS:3025(P-44)	7.2	30
5.	Oil & Grease (mg/l)	IS:3025(P-39)	<1.0	10

EPA- Environmental Protection Act-1986

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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Annexure VII: Water Saving Gadgets

Electronic Taps (e-taps)

The latest trend in industries is to install electronic taps (e-taps). The advantages of using e-taps are as mentioned below:

- Unlike conventional taps, there is no twisting or turning in e-taps. They have a sensor, which cuts off water supply completely when not in use. This helps in saving up to 70% water during hand wash

- E-taps enable hands free operation. No fear of cross contamination or contact with germs. E-taps score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.

- E-taps can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.

- The touch free electronic taps, available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Operation of Electronic Taps

This has been successfully implemented in several hotels & restaurants. Of late, several industries have also started implementing this proposal.

Thus, there is a good potential to optimize the freshwater consumption by replacing the existing taps with e-taps.

Electronic flush (e-flush) urinals

The latest trend in industries is to install e-flush urinals. The advantages of using e-flush urinals are as mentioned below:

- E-flush urinals are fitted with a sensor, which senses the usage and flush with water for few seconds after use. This helps in saving 70% water during urinal flush
- E-flush urinals enable hands free operation and score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.
- E-flush urinals can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.
- The touch free e-flush urinals available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Photographs: Electronic flush urinals

Waterless urinals

Waterless urinals eliminate 100% water usage in urinal flush. The concept is based on blue seal technology. The patented blue seal density is lesser than urine and hence allows the passage of urine and acts as a protective layer. The blue seal also eliminates odour emanating from urine. The blue seal is bio-degradable and has to be replaced once in 5000-7000 usages.






Photographs: waterless urinals

Hand wash
NEERR nozzles

Demonstration conducted at a site showed a water saving of 92.18% in the mist mode, 85% in the foam mode and 60% with the normal aerator nozzle.



Photographs: Basic Aerator, NEERR nozzle: Foam Mode and NEERR nozzle: Mist Mode

Thus, 85% water saving can be assumed though installation of these NEERR nozzles.

Technical details about the product: NEERR[2] nozzles are based on water A.R.T. (Atomizer Reduction Technology)[3], which atomizes the water and creates a heavy mist, hence reducing the consumption in any washing application by up to 95%. There are two modes available in the same nozzle:

Mist Mode: Saves up-to 95% water (at 3 bar pressure). It is perfect for daily utility activities like brushing, washing dishes etc.

Normal Mode: With a twist, Neerr switches to normal mode, which still saves up to 75% water (at 3 bar pressure). It is more useful while filling glasses, pots etc.

Installation: Retrofits into the existing tap**;** Unscrew the existing aerator and insert the Neerr Nozzle.

Dimensions: Fits Standard (20.8 mm), Junior (18.1 mm) and Tom Thumb (15 mm) sized taps (inner socket dimension)

Material: Lead Free Brass (Chromed Handles)

Water Pressure: 1.2 – 8bar. (Suitable for low pressure water systems).

Water Temperature: Max 192 degree F / 89 degree C

[2] NEERR^{TM} is a product innovated by ZeFi Labs with RETAS as Marketing Partner
[3]It is a patent pending technology by ZeFi Labs

Foam taps

Conventional taps are used in the hand wash areas which results in large quantity of fresh water. Foam taps are a better fit in these high consumption areas. They consume 25-30% less than the conventional taps.





Photographs: Foam taps

Spring loaded Push taps

Spring loaded push type tap is an alternate device for minimizing hand wash Water. The spring-loaded push taps operate with the simple mechanism of pressing the knob for water. The knob automatically released back to close position in 5-7 seconds. This saves about 30-40% of water compared to the conventional taps





Photographs: Spring loaded push taps

Low flush cistern

The latest model closets are water efficient and operate in dual mode with single flush releases 2 liters and dual flush releases 4 liters per flush. This results in large quantity of water savings.





Photographs: Low flush cisterns

Annexure VIII: Suggestive List of Vendors for providing water saving equipment/technology/consultancy

a. Supplier Addresses of Water & Wastewater Treatment Systems and Water Saving Devices

1. Hitech Enviro Engineers & Consultants Pvt. Ltd.
Address: Plot No : A-1, Ground Floor,
Kaushambi, Ghaziabad – 201010
Tel: 0120– 4294461-63,
Fax: 0120- 4294462
Email: projects@heecpl.com
Website: www.heecpl.com
Contact Person: Mr. Hitesh Mittal (Director)

2. Arvind Envisol Ltd.,
Address: Naroda Road, Ahmedabad,
Gujarat-380025
Tel: 079 30138000
Fax: 079 30138677
Email: ashini.shah@arvind.in
Website: www.arvind.com
Contact Person: Mr Ashini Shah

3. GE India Industrial Pvt. Ltd
Address: Building No 7A, 5th Floor DLF Cyber City,
DLF Phase III, Sector 25A, Gurgaon
Haryana – 122002
Tel: 0124 4808016
Mobile: 09999907981
Email: himanshu.gupta@ge.com
Contact Person: Mr Himanshu Gupta

4. Genesis Membrane Sepratech Pvt. Ltd
Address: No18, Vardhaman Complex
No 10, L.B.S Marg, Vikhroli (West)
Mumbai – 400 083
Tel: 022-5775456 / 5775458
Fax: 022-5790608
Mobile: 9322229520
Email: genesis@bom5.vsnl.net.in
Contact Person: Dr BibhashChakravorty

5. **Ion Exchange India Ltd**
Address: Block B, Flat No.8, Local Shopping Center
Ring Road, NarainaVihar
New Delhi - 110 028
Tel: 011 2577 1160/0862/6061/6065
Fax: 011 2577 4837
Email:delcro@ionexchange.co.in

6. **Jindal Water Infrastructure Ltd**
Address: Jindal ITF Centre, 28 ShivajiMarg, New Delhi 110015
Telephone: 011-45021983, 45021984
Fax: 011-45021982
Email: info@jindalaquasource.com
Website: www.jindalaquasource.com
Contact Person: Mr SudhirMalhotra, Sr Vice President

7. **Doshi Ion Exchange & Chemical Industries Limited**
Address: C – 147, Madhuban
Near Universal Public School
New Delhi 110092, India
Tel: +91-11-22502064 / 22022175
Fax: +91-11-22044979
Email: delhi@doshion.com

8. **Max Pure Water Systems**
Address: Near Bharat Petrol Pump,
Opposite Bharat Cancer Hospital,
Kumbharia Road, Saroli, Surat. Gujarat
Telephone: 0261-264 3894
Fax: 0261-264 0034
Mobile: 98980 43960, 98980 41900
E-mail: maxpurero@gmail.com; info@maxpurero.com
Website: www.maxpurero.com
Contact Person: Mr. Kailash Shah, Director

9. **Chempure Technologies Pvt Ltd**
Address: 28/1, Manjolai 2nd Main Road
Kalaimagal Nagar Extn., Ekkaduthangal
Chennai – 600097
Tel: 044-22250173 / 22250162
Fax: 044-22250867
Mobile: 9444076114
Email: chempure@vsnl.net
Contact Person: Mr Leo Vino

10. **Pentair Water India**
    Address: L/52-55, Verna Industrial Estate
    Verna, Salcette
    Goa – 403 722
    Tel: 0832-2883300
    Fax: 0832-2883312
    Contact Person: Mr MritunjayChaubey

11. **Nuchem Weir India Limited**
    Address: E-46/12, Okhla Industrial Area,
    Phase - II , New Delhi - 110 020
    Tel: 26385737, 26383234, 26384656
    Fax: 51611846
    Manager-Water Treatment
    Email: msakhtar@nuchemweir.com
    Contact Person: Mr M.S.Akhtar

b. Flow Meters (Fixed/Portable)

1. **Forbes Marshall Pvt. Ltd.**
    Address: A-34/35, MIDC, H Block,
    Pimpri, Pune-411018, Maharashtra
    Telephone: 020-2744 2020
    Fax: 020-2744 2420, 2040
    Mobile: 98505 67714
    E-mail: rmishra@forbesmarshall.com
    Website: www.forbesmarshall.com
    Contact Person: Mr Rakesh Mishra,
    Head - Water Business

2. **Iota Flow Systems Pvt Ltd**
    Address: A-2/13 Phase II ,Industries Area,
    Maya Puri, New Delhi - 1100 064
    Tel.: 91-11-46254601-08 Extn 17
    Moblie: 09958609393
    Fax: 91-11-46880020
    Email: sunil@iotaflow.com
    Contact Person: Mr Sunil Yadav

3. **GE India Industrial Pvt. Ltd**
    Address: Building No 7A, 5th Floor DLF Cyber City,
    DLF Phase III, Sector 25A, Gurgaon
    Haryana – 122002
    Tel: 0124 4808016
    Email: Srikanth.Kommu@ge.com

Contact Person: Mr Srikanth Kommu

4. **Rockwin Flowmeter India Pvt Limited**
   Address: B-24, Site IV,
   Sahibabad Industrial Area,
   Ghazibad-201010, Uttarpradesh
   Tel: 0120-2895400, 2896286, 2895079
   Fax: 0120-2895450
   Mobile: 9810129687, 9331052312, 9381026604
   E-mail: rajiv@rockwin.com; Mumbai@rockwin.com; rockwinkolkata@vsnl.net; rockwinchennai@vsnl.net
   Website: www.rockwin.com
   Contact Person : Mr Rajiv Prakash

5. **Orbit Technologies Pvt. Ltd.,**
   Address: B-50, Sanathnagar Industrial Area,
   Hyderabad-500018
   Ph: 040-67216354
   Fax: 040-23801579
   Email : orbit@orbitindia.com
   Website :www.orbitindia.com

c. Water Saving Gadgets (e-flush, e-taps, Foam taps, dual flush cisterns & low flow showers)

1. **Hindustan Sanitary ware & Industries Ltd.**
   Address: Tewari House, 2nd Floor, 11 - B / 8
   Main Pusa Road, New Delhi - 110005
   Tele Phone: 011 - 2585 4656
   E-mail: nitinkulkarni@hindware.co.in
   Contact Person: Mr. Nitin Kulkarni, Head,
   Institutional Sale & Business Development

2. **Jaguar & Company Limited**
   Address: 306, Udyog Vihar,
   Phase-II, Gurgaon (INDIA)
   Hand Phone: 098110 23782
   E-mail: bandu@jaguar.com
   Contact Person: Mr.Bandhu,
   Asst. Manager Production

3. **Kohler India**
   Tele Phone : 0124 - 4319 685 / 86
   E-mail : indiacustomercare@kohler.com

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Annexure IX: Guidelines for installation of Flow meter on Borewells

Digital Water Flow Meter with Telemetry for Groundwater extraction monitoring as per CGWA notification

Technical specifications

1. Specification of Tamper proof Electronic water meter with telemetry

Metering Technology	: Ultrasonic or Electromagnetic
Communication type	: LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G)
Tamper proof:	
a) Power source	: The meter shall be battery operated or UPS powered supply with provision of power OFF detection. The telemetry system units shall be battery operated or through external power supply. The metering data should be stored in the meter even if the telemetry system is off due to power failure.
b) Sealing	: The meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
Compliance	: The meter shall preferably be manufactured as per ISO 4064: 2014 Standards and shall have IP 68 ingress protection.
Accuracy	: The meter shall be of accuracy better than ± 2% for the operating flow range (from 10 % to 100 % of maximum flow rate).
Test certificate	: The meter manufacturer shall submit the latest test/calibration certificate of the meter, from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL) or any third party laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), for every meter.
Parameters to monitor	: The meter (since installation of the requisite water meter) shall transmit the following parameters to a

	secure cloud • Timestamp • Cumulative forward flow volume • Cumulative reverse flow volume • Cumulative Net volume • Cumulative pump working hours • Meter serial number • Device last calibration date • Borewell id (Provided by CGWA)
Cloud	: The Communication / telemetry data should be directly captured in a secure cloud. The cloud service provider should be empaneled with The Ministry of Electronics and Information Technology (MeitY).
Transmission frequency	: The data shall be transmitted minimum 2 times in a day
Battery life	: In case of battery operated meters the battery shall run at least for a period of 3 years with 2 transmissions per day. The battery shall be replaceable without any data loss.
Data acquisition	: The meter shall be supplied with complete AMR / AMI system with Data Management software. The Data Management Software must be capable of running on a standard PC. The Data Management Software should be cloud based and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.
Real-time data to CGWA	: The un-tampered data from the secure cloud shall be sent to Central Ground Water Authority (CGWA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.

2. Installation of meter

Location	: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure. 1
Bypassing	: There shall be no bypassing of pipe prior to the installed flow meter.
Full flow	: The installation of the meter shall ensure the pipe shall have full of water at all times. Sufficient upstream and downstream straight length shall be provided for the meter (Refer to Figure 1.)

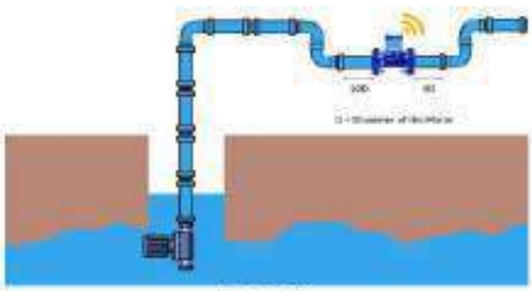


Figure. 1

Installation position of tamper proof flow meter with telemetry at groundwater abstraction structures.

3. DETAILED TECHNICAL SPECIFICATIONS OF AMR / AMI WATER FLOW METERS

3.1 Specification of flow meter

Flow meters shall meet the following metrological specification:

Turndown ratio of 10 or above
Accuracy ± 2%
Technology: electromagnetic or ultrasonic

3.1.1 Size:

1. DN40 - Flow range: 0.5 lps to 5 lps
2. DN100 - Flow range: 3 to 30 lps
3. DN150 - Flow range: 13 to 130 lps

Meter performance shall not get affected by external magnetic field, as specified in ISO4064.

Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.

3.1.2 Material of Construction:

The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per applicable standards (referred above).

- The water meter and accessories shall be manufactured from materials of adequate strength and durability.
- The body of the meter shall be of Brass/Bronze/MS/CI/SS/Engineering Plastic and compact enough to avoid tampering of meter. The manufacturer shall specifically mention in the offer, the material used in manufacturing.
- The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste, odor or discoloration in the water supply.
- The painting material used should be free from toxic constituents and safe for human uses and should not affect human health (Health Certificate should be attached/provided).
- Each meter should be supplied in separate individual box with its accessories, test/ calibration Certificate (for accuracy parameter) and Guarantee Card for free repair/replacement during the warranty period.

3.1.3 Markings on the Body of the Meter:

- Make/Brand, Size / Nominal Dia.
- Sl. No. / Year of Manufacture, Metrological specifications etc.

3.1.4 Meter indicator

The digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.

- It shall be of straight reading type
- No. of digits and verification scale interval shall be as sufficient enough to meet the required accuracy.
- Totalizer shall be made of suitable material required to maintain IP 68 protection class.

3.2 Telemetry System

- The AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering etc, along with necessary alarms.
- The system will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.
- The battery shall be replaceable without any data loss.
- The meters should report an alarm to the server as and when tampered.
- All Water Meter readings should be time stamped.
- The meter should have the capability to detect and record reverse flow separately.
- The meter should be capable of to detect Leak, Zero (No) Flow, High Flow.
- The AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The AMR/AMI should function even in the presence of high voltage power lines.
- Battery usage has to be indicated at the server. Provision should be provided to replace batteries if required.
- The communication shall be encrypted to avoid tampering.
- The meter should be configurable either using the DTU or from the server.
- Loss of communication should be indicated in the server within 48 hours.
- The meter should be able to log the daily flow data with a timestamp which is supposed to be sent to the cloud via telemetry for at least 2 years.
- In case the telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.
- This data shall also be used for retrieval in case of any dispute between meter data and online data.

3.3 Data Management Software

• The web based Data Management Software must be capable of running on a standard PC compatible with minimum Pentium Processor; in addition, the software must run under Windows XP Professional, Windows Vista, Windows 7 and / or latest version of Windows Operating System and HP Unix, Linux, Solaris, etc.

• The Data Management Software should be cloud base and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.
• The Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email/SMS to the user.

• The Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.
• The Data Management Software should be able to display all kind of data on screen at any time.
• The Data Management Software should have capability to add additional customer information and create customizable data fields.

3.4 Lab Testing / calibration:

Testing or Calibration of meters shall be performed at ISO 17025: 2017 accredited laboratory. The accuracy of meter shall be within ± 2 % in the operating range. The meter shall have valid model approval certificate.

The meter shall have model approval from India or abroad. Every meter should be calibrated / tested for accuracy in the operating flow range (10% to 100%). At least 4 point calibration at 10%, 40%, 70% and 100% of maximum/rated flow shall be performed.

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WATER AUDIT REPORT

As per the guidelines of CGWA

MINISTRY OF JAL SHAKTI

At

Bajaj Energy Limited, Maqsoodapur, Shahjahanpur, Uttar Pradesh

Prepared by

Confederation of Indian Industry
CII-Triveni Water Institute

April 2022

Water Audit Report
Bajaj Energy Limited, Maqsoodapur, Shahjahanpur, Uttar Pradesh

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It is well worthy to mention that the efforts being taken, and the enthusiasm shown by all the personnel towards water conservation are really admirable.



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Abbreviations

MGF	Multi-Grade Filter
DMF	Dual Media Filter
UF	Ultrafiltration
RO	Reverse Osmosis
ERS	Effluent Recovery System
CGWA	Central Ground Water Authority
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
ETP	Effluent Treatment Plant
IMD	Indian Meteorological Department
LPCD	Liter Per Capita Per Day
RWH	Rainwater Harvesting
SAC	Strong Acid Cation (DM plant unit)
SBA	Strong Base Anion (DM plant unit)
STP	Sewage Treatment Plant
WTP	Water Treatment Plant

Executive Summary

Bajaj Energy Limited, Maqsoodapur, District Shahjahanpur, Uttar Pradesh division is a coal based thermal power plant. It is situated in Shahjahanpur District of Uttar Pradesh. It is spread across an area of 30 acres including Plant, ETP, New Coal yard & Ash Dyke. There are 3 borewells installed inside the plant area. The wastewater generated in the plant is treated in the common effluent treatment plant. The treated effluent from this ETP is used for various activities like firefighting, ash handling, dust suppression and gardening. The specific water consumption for the plant is 2.91 m^3/MWh of power generated (2020 – 2021).

Currently, the plant had a consent to withdraw 21,06,000 m^3/annum of water from 3 nos. borewells located within the plant area vide Registration no. 202106000472, 202106000470 valid up to 28/08/2026 and application no. SHJP0621RIN0039, SHJP0621RIN0038 and SHJP0621NIN0027 from 3 borewells available inside the plant. At present, approximately 3808.40 m^3/day of water is used for the plant operations as against the permitted quantity of 7020 m^3/day. The plant has installed two piezometers with digital water level recorder and at four locations manual piezometers is used for water level monitoring inside the campus in compliance of the conditions mentioned in the NOC issued to them by Ground Water Department, Ministry of Jal Shakti, Government of Uttar Pradesh.
The plant has installed electromagnetic flow meters on all the three borewells and also on the common header of the borewells. Electromagnetic Flowmeters have also been installed at other locations like Boiler Feed, RO Reject, ETP Outlet, domestic water consumption etc.

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 60.84 % which puts Shahjahanpur district in the category of safe zone.

Given the above scenario of prevailing resource challenge, accelerating over time the management of Bajaj Energy Limited is very keen to do water audit of their premises. To get benefit of water saving projects, management of Bajaj Energy Limited awarded the task of water audit of its premises at Maqsoodapur, District Shahjahanpur, Uttar Pradesh to CII Triveni Water Institute.

The audit is focused on improving water usage efficiency and identifying water conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by CII team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis.

Summary of Water Audit findings are presented in the following table shown below:

I	**Total Fresh Water Intake (Average)**	**3808.40 m^3/day**		
II	**Savings Achievable**	**103.28 m^3/day**		
	Water Saving Potential (%)	**2.71 %**		
Recommended Projects				
S.No.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	3.28	0.3	0.01
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	9.13	100
Observations				
1	No smooth platform was present along the boundary of cooling tower sump to reclaim drifted water from the surface			

- Water balance across the plant has been successfully achieved. Total consumption- Bore well: 3808.40 m^3/day (average of April 2020 – March 2021)
- Strategies identified for reduction, reuse and recycle show:
  - Collection and Reuse of supernatant MGF backwash water after settling in a settling tank
  - Installation of RO plant for treatment of ETP treated effluent and reuse in cooling towers
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.
- Internal audits to be undertaken at BEL, Maqsoodapur (every year); third party audits also recommended.

1. Introduction and background

1.1 Introduction

Water is a core element of natural capital, underpinning many business activities. Water risks cut across most industry sectors. As per the World Economic Forum Global Risks report, water crisis is the third most impactful global risks to business (WEF 2017). The risk continues to rise given the increasing demands and rising pressures. Safeguarding water and ensuring its availability in sufficient quantity and quality is therefore subject of vital interest to business.

Bajaj Energy Limited deals in generating coal-based power for UPPCL. They have an installed capacity of 2x45 MW power plant.

The present study focuses on BEL, Maqsoodapur unit for water audit at the plant level that would help in identification of appropriate water management and conservative strategies to minimize the risks to operations.

The first step towards efficiently managing and conserving water resources is monitoring and mapping water consumption under various processes. This involves conducting a regular water audit that identifies and quantifies water uses and losses from a water system.

A comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions.

Good initiatives taken by the plant

- Monitoring system for flow by installation of electromagnetic flow meters at borewells and other strategic locations, mechanical flowmeters installed at other locations such as pump house, cooling tower blow down etc.
- No fresh water is used for horticulture.
- The ETP treated water is used in various applications like gardening, ash handling, dust suppression and firefighting.
- The ETP treated water is used for Firefighting in the entire plant.
- Rainwater harvesting pits have been constructed for recharge of ground water collected from paved road and sideways.
- SWAS panel water is being collected and used as cooling tower makeup.

2. Scope

The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Maqsoodapur.

Scope of work of the study includes the following:

- Study of water sources (size, capacity, quantity, quality)
- Existing water distribution system, associated losses, Wastewater discharge points across the process and Identification of water
- consumption of each existing meter/sub-meter
- Quantification of water distribution network in each section
- Mapping of raw water, process, recirculating water, cooling & domestic, recycling & effluents
- Segregation and collection of waste streams based on quality and quantity
- Study of various treatment & disposal schemes deployed in the plant
- Identification and Recommendations of projects based on reduce reuse & recycle on water Conservation
- On-site discussion with facility manager and personnel
- Monitoring and measurements using pressure and flow meters and various other devices as and when required
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Water system analysis and Quantification of baseline water map
- Developing Water consumption and wastewater generation pattern
- Evolving value added "cost of water" at various water use locations
- Identification of "branch flow unbalancing" at multi-cell cooling tower & associated losses in cooling tower efficiency & high drift losses
- Calculation of Rainwater Harvesting Potential for the site
- Estimating Specific water use and conservation potential
- Evolving recommendations/schemes for improvement in water and wastewater management system With Cost
- Recommendations for reduction in water consumption particularly in two conditions
    - Plant Stoppage Condition

  - Plant Running Condition
- Checking the compliances of all conditions/requirements as stipulated by government authority such as CGWA, MOEF etc.

3. Methodology of the Study

A team of two engineers were involved in carrying out the study. The study methodology involved the following steps:

- Preliminary discussions with plant personnel and observations in all water consuming areas
- Data collection through discussions, past records, specifications
- Identification of water conservation options on short, medium & long terms
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion, and submission of report to the management

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of portable instruments for carrying out various measurements and analyses. CII has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support water audit investigations and analyses. The specialized instruments that were used during the water audit include Ultrasonic water flow meter.

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

4. Assessment of Present Water Usage

4.1 Plant Water Consumption Trends

The source of water to the plant is borewell. Borewell water is majorly used for cooling and production applications after suitable treatment in water treatment plant. Borewell water is also utilized for domestic purposes. The figure below indicates the water consumption trend from April 2021 – March 2022. The uneven water consumption trend could be noticed because of the plant gets instructions from UPPCL for shutdown based on load requirements.

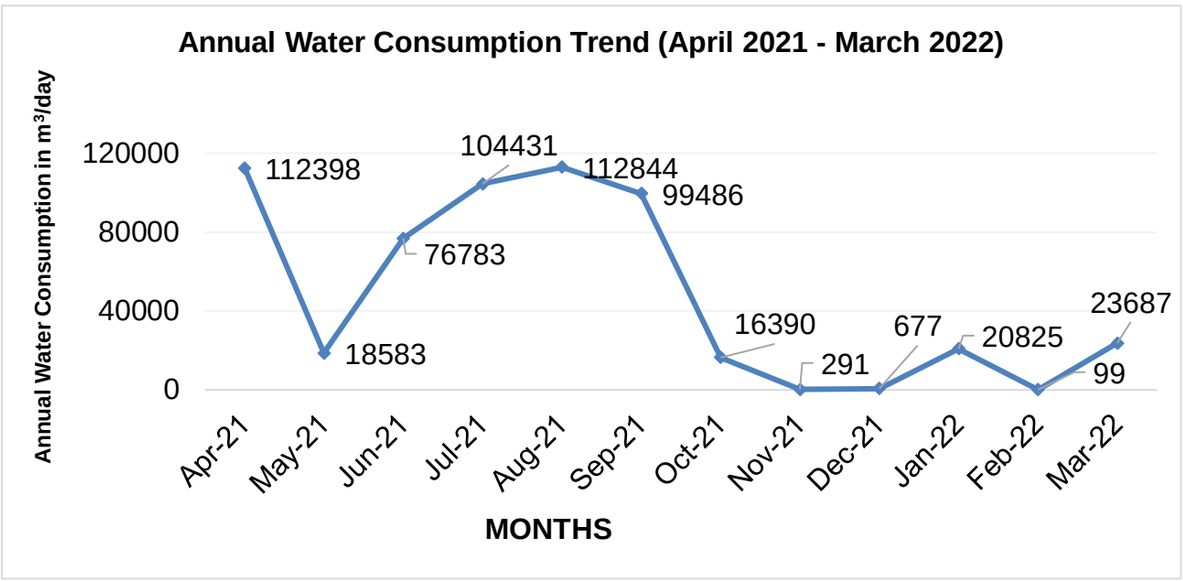


Figure 4.1: Water Consumption Trend April 2021 – March 2022

Specific Water Consumption

The specific water consumption is 2.91 m^3/MWh based on the data (2020 - 2021) provided by the BEL, Maqsoodapur team.

4.2 Water Sources

The source of water to the plant is borewells. The plant has 3 borewells within its premises. Raw water is majorly utilized for cooling tower makeup and producing DM water which is utilized for feed to the Boiler. The average daily water consumption through borewells is 3808.40 m^3/day (2020 - 2021).

The total water consumption for past three calendar years is as follows:

Table 4.1 Water consumption trends for past 3 years

Year	2019 - 2020	2020 - 2021	2021 - 2022
Water Consumption (m^3/year)	427361	309627	569153

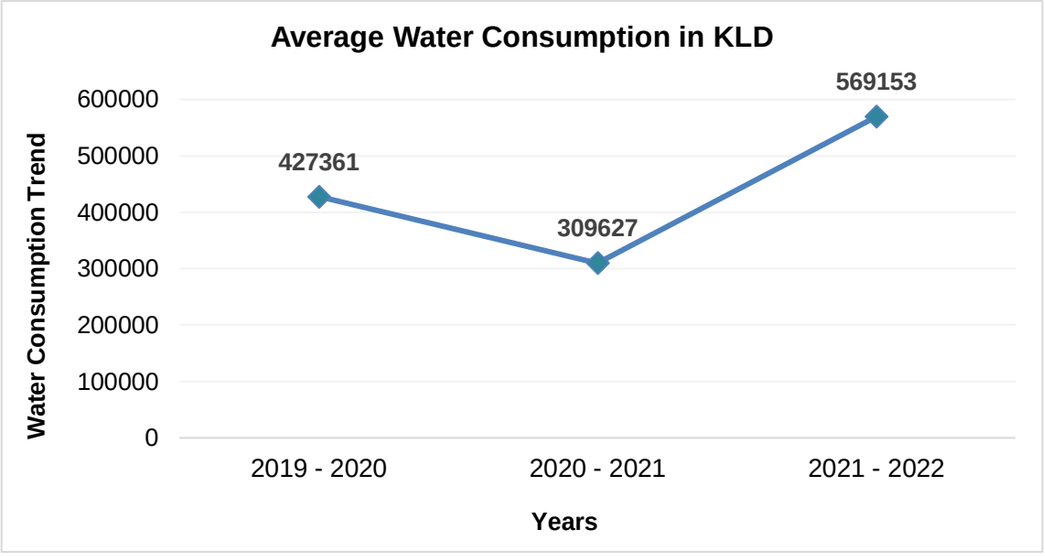


Figure 4.2: Water Consumption Trend in KLD

The running hours of borewell range from 7-18 hours depending upon requirement.

The detailed description about the water source is provided below in the tabular form in table:

Table 4.2 Borewell Details

S. No.	Description	Depth (ft)	Pump H.P	Pumping capacity (m^3/h)
1	Borewell-1	110	30	180
2	Borewell-2	110	30	180
3	Borewell-3	110	30	180

Rainfall Pattern in last 5 years as per IMD

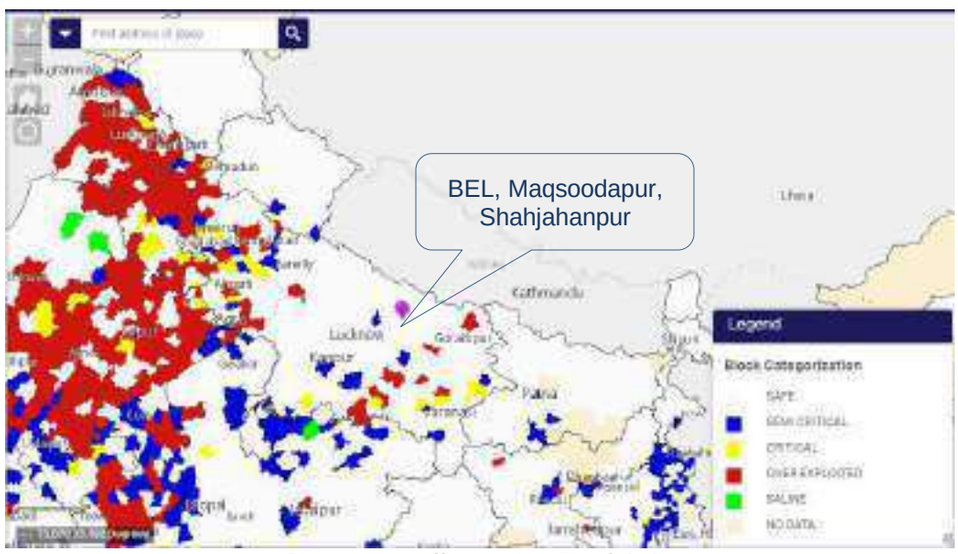
Total rainfall received at Shahjahanpur district, based on IMD datasets shows that average rainfall is around 758.41 mm. The rainfall varies between 653.58 mm to 923.96 mm in last 5 years (2017 to 2021).

Table 4.3 Average annual rainfall (mm) in last 5 years as per India WRIS[1] data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	29.86	0.32	9.06	0.08	20.82	40.53	227.81	186.52	138.48	0.02	0	0.08	653.58
2018	1.19	11.35	0.58	5.99	5.68	47.38	339.02	408.02	101.72	1.62	1.41	0	923.96
2019	3.37	24.48	9.17	3.27	1.04	53.51	329.61	97.79	77.5	1.76	5.71	63.75	670.96
2020	21.81	8.27	59.81	21.59	36.64	71.07	209.94	155.08	64.72	0	7.12	0	656.05
2021	1.1	0.8	0.15	2.31	98.55	165.59	229.1	102.81	116.9	169.33	0	0.88	887.52
Average Annual Rainfall													**758.414**

Groundwater situation at the plant site

The stage of groundwater extraction as reported by CGWB (assessment year: 2020) is 60.84% which puts Shahjahanpur district in the category of safe zone.

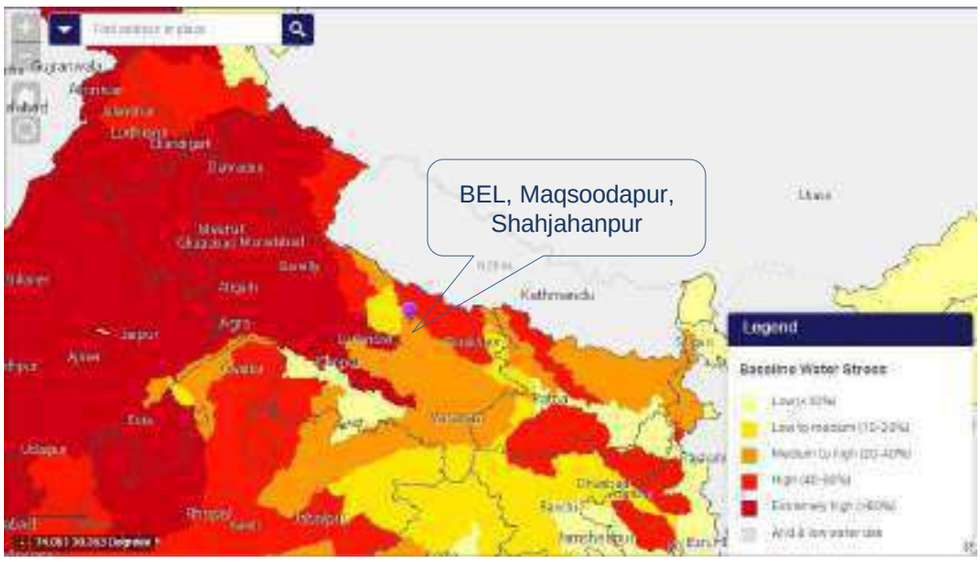


Source: India Water Tool 3.0

Figure 4.3 Groundwater Block Categorization of Maqsoodapur, Shahjahanpur district

[1] Source: India-WRIS (indiawris.gov.in)

As per the India water tool the block lies in High (40-80%) baseline water stress zone. Higher value indicates that there is more competition among users related to water for domestic, industrial, agriculture and other purpose



Source: India Water Tool 3.0

Figure 4.4 Baseline Water Stress of Shahjahanpur District

4.3 Water Supply & Distribution Details

The water extracted from any of the 3 borewells is pumped through a common header line to the cooling towers, inlet to DM plant and for domestic water utilization. The major water consumer in the unit is the cooling tower.

For generation of DM water, the raw water from the borewells is first fed to a Multi Grade Filter (MGF) followed by a 2 stage RO system of 16 m^3/h (inlet) Capacity. The RO- permeate generated is fed to the DM plant which consists of Strong Acid Cation (SAC) followed by Strong base Anion (SBA) followed by Mixed Bed (MB). The reject from the RO and regeneration from the SAC, SBA & MB go to the N-pit. The DM water generated post MB is stored in 2 nos. DM water storage tank of capacity 350 m^3. The DM water is used as feed to the boiler.

4.4 Water Balance

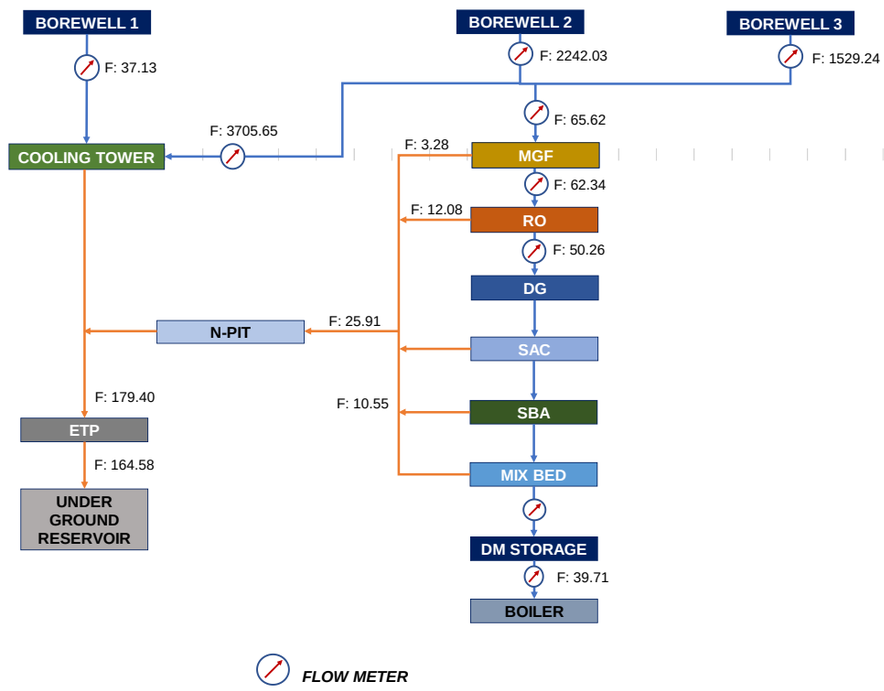


Figure 4.5 Water Distribution network diagram

NOTE: This balance has been prepared on average of the data from Financial Year 2021 - 2022

Overall plant water balance is shown below in tabular form in table 4.4

Table 4.4 Overall Water Balance (Daily Average)

Fresh water Balance			
S.No.	**Description**	**Quantity (KLD)**	**Remarks**
1	Inlet from Borewell 1	2242.03	FM reading
2	Inlet from Borewell 2	1529.24	FM reading
3	Inlet from Borewell 3	37.13	FM reading
	Total freshwater Inlet	**3808.40**	
Fresh water Distribution			
4	Inlet to DM Plant	65.62	FM reading
5	From Borewell 1 to Cooling Tower	37.13	FM reading
6	From Borewell 2&3 to Cooling Tower	3705.65	Calculated value
	Total Fresh Water Distribution	**3808.40**	
DM Plant water balance			
7	Inlet to MGF	65.62	
8	MGF Backwash	3.28	
9	RO Inlet	62.34	
10	RO Reject	12.08	
11	Inlet to DM Plant SAC	50.26	
12	SAC, SBA & MB Regeneration	10.55	Calculated Value
13	DM water feed to Boiler	39.71	

4.5 Domestic water Consumption

It is mentioned by the plant officials that the Bajaj Energy Power Limited is not using domestic water from their own borewells number 1, 2 and 3 located in their premises. The domestic water need of the plant personnel is catered by the separate water line from the adjacent Bajaj Sugar Mill area.

4.6 Rainwater Recharge & Harvesting

During the water audit study of the plant, it was found that plant is practicing the rainwater recharge by means both rooftop and paved area drainage through storm water drainage network.

Rainwater harvesting potential is the total amount of rainwater that can be harvested from a given site throughout the year. It can be calculated using the following formula:

Rainwater Harvesting Potential (KL) =
Catchment Area (sq.m.) x Average Annual Rainfall (m) x Run-off Coefficient

Average Annual Rainfall for Maqsoodapur = 758.41 mm

The following table summarizes the total rainwater harvesting potential from the plant:

Table 4.5 Rainwater Recharge potential

Description	Area (m^2)	Runoff coefficient	Annual Rainfall (mm)	RWH Potential (KL)
Rooftop area (m^2)	4489	0.85	758.41	2893.82
Paved Area (m^2)	6048	0.65		2981.46
Green Area (m^2)	43706	0.15		4972.06
Unpaved area (m^2)	815	0.15		92.71
Total				**10940.05**

It can be seen from the table above that there exists rainwater harvesting potential of 10940.05 KL throughout the plant.

4.7 Water Metering & Monitoring System

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. The presence and regular monitoring of flow meters ensures that the flows in the plant are well accounted. During the audit, the available flow meters were identified, and their working conditions were checked. The plant has installed flowmeters at various strategic locations, the flowmeter readings in comparison with ultrasonic flow meter readings have been in the table given below.

Table 4.6 Comparative Flow Meter Reading in m^3/hr.

S. No.	Metering Locations	Flow Rate in m^3/hr		%Age Error
		BEL	CII	
1	Borewell CHP	165	171	3.51
2	Borewell UGR	152	151	-0.66
3	Borewell DM PLANT	172	168	-2.38
4	MGF INLET	19.1	19.5	2.05
5	RO1 REJECT	4.1	3.8	-7.89
6	RO1 INLET	19.1	19.5	2.05
7	RO1 OUTLET	12.3	11.8	-4.24

8	RO2 REJECT	4.06	4.1	0.98
9	RO2 INLET	19.1	19.5	2.05
10	RO2 OUTLET	12.3	11.9	-3.36
11	NPIT OUTLET TO ETP	25	23.2	-7.76
12	ETP OUTLET	55.9	55.3	-1.08
13	Cooling Tower Blowdown to UGR	38	38.6	1.55
14	RISER 1		1842	
15	RISER 2		1847	
16	RISER 3		1917	
17	RISER 4		1947	
18	RISER 5		1822	
19	RISER 6		1914	
20	SSF OUTLET		140	
21	SSF INLET		148	
22	BFP & Compressor &Cooling water return line.		16.7	

4.8 Water Costing

The cost of the different types of water is illustrated given below in table:

Table 4.7 Water Cost

S. No.	Description	Total Cost (Rs./m^3)
1	Borewell Raw Water Cost	5

5. Water & Wastewater Treatment Practices

This section provides the detailed analysis of the data along with the key findings.

The effluent generated from the plant is treated in an Effluent Treatment Plant (1000 KLD) and the treated effluent is used for gardening, ash handling, dust suppression, firefighting etc.

Table 5.1 Wastewater Discharge Status (Daily Average)

S. No.	Description	Quantity (KLD)	Mode of Disposal
1	Cooling Tower Blowdown	213.21	Effluent Treatment Plant
2	MGF Backwash	3.28	
3	RO Reject	24.11	
4	SAC Regeneration	10.55	
5	SBA Regeneration		
6	MB Regeneration		

5.1 Raw/Fresh water Treatment

The water from borewells number 2 & 3 is supplied to the Water treatment plant. The treatment plants consist of MGF, and RO system followed by DM plant. Though they have installed softener, but at the time audit it was not operational and as per inputs from the plant team the softener is not being used at all. The water after passing to the RO system, goes to the DG, SAC, SBA and MB. The DM water generated post MB is stored in DM water storage tank of 350 m^3. The wastewater from the MGF backwash, RO Reject, and DM plant regeneration is collected into the N-pit from where it is sent to the ETP plant for further treatment.

For cooling purpose, water is being fed through these three borewells into the cooling towers and its blowdown water is sent directly to the ETP after mixing with the N-pit discharge water. These borewells also meet the requirement for domestic purposes primarily for drinking purposes.

A schematic of the raw water treatment system inside the plant is shown below:

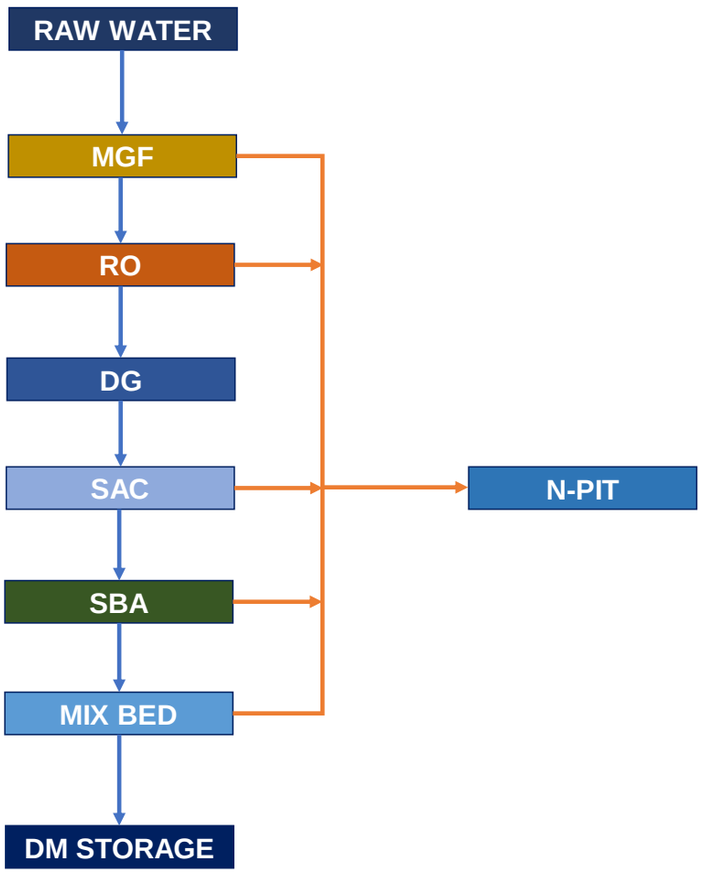


Figure 5.1: Schematic diagram of water treatment system

5.2 Waste Treatment & Disposal

The schematic of wastewater treatment and disposal is shown below

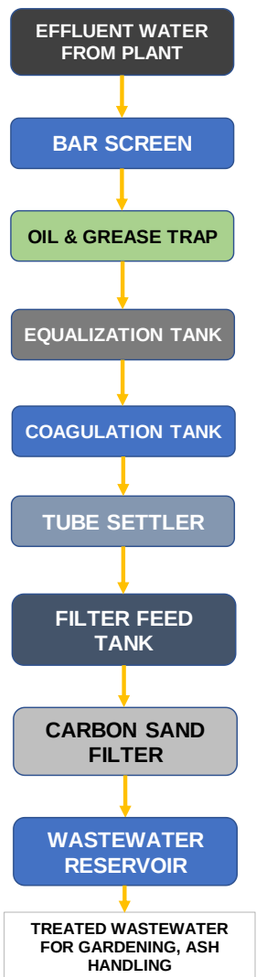
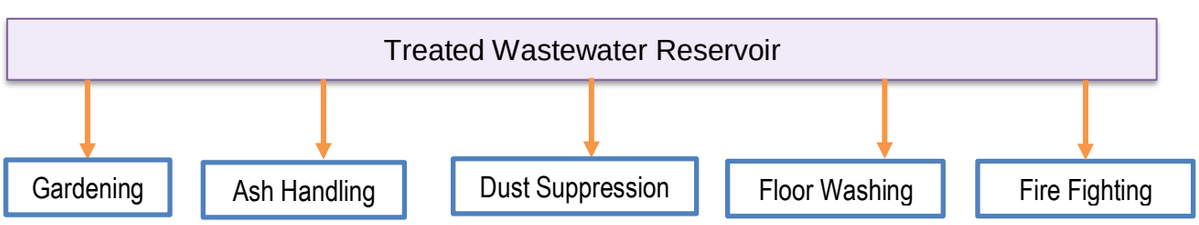


Figure 5.2 Schematic of Effluent Treatment plant

The treated water from the ETP is used for various secondary activities such as gardening, ash handling, dust suppression and floor washing.



5.3 Sewage Treatment

The plant has installed a Sewage treatment plant of 50 KLD capacity inside its township and pipeline has been laid for routing sewage to this STP.

5.4 Environmental Compliance related to Water

- BEL, Maqsoodapur is currently extracting 3808.40 m^3/day (April 2021 – March 2022) against a permission of 7020 m^3/day.
- Plant has installed Electromagnetic flow meters at all the 3 borewells and at remaining locations Electromagnetic/ mechanical flow meters have been installed.
- 02 nos. Piezometer with Digital water level recorder and at four locations manual piezometer is used for water level monitoring in the campus in compliance of the NOC conditions. The piezometers with DWLR support telemetry.
- As per the NOC issued by Ministry of Jal Shakti, Government of Uttar Pradesh the plant has to adopt rainwater harvesting/ recharge in the project premises. 2 nos. rainwater harvesting pits have also been constructed within the campus to collect rainwater from the paved roads and cemented sideways.
- Ground water quality is being regularly monitored through inhouse laboratory and the samples are also sent to NABL accredited lab for testing. The reports have been attached along in annexures.
- As per UPPCB Consent order, the domestic sewage generated within theplant premises should be treated in a sewage treatment plant. A sewage treatment plant of 50 KLD has been installed in the township and domestic wastewater is routed here for treatment.

6. Water Conservation Opportunities

6.1 Water Saving Proposal 1: Reuse of filter backwash (MGF) water after settlement in a settling tank

6.1.1 Present Status

Presently the MGF backwash being generated from the Multi Grade Filter is being discharged into the common drain which goes to the N-pit.

The schematic of the present system is shown below:

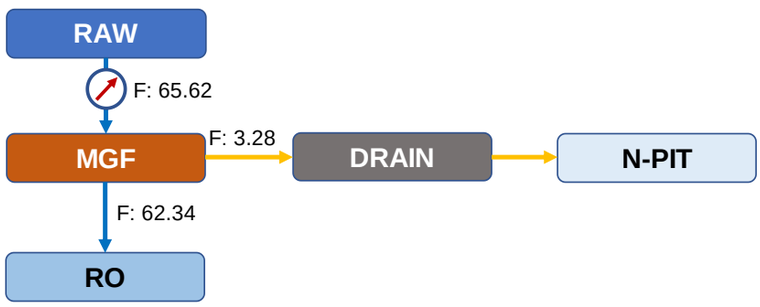


Figure 6.1: Schematic of present system of MGF Backwash

6.1.2 Recommendation

It is recommended to reuse the backwash water from the MGF and instead of sending it to the N-pit, the filter backwash should be stored in a settling tank to store water and allow for settlement of the supernatant particles. This backwash water does not have any impurities except for suspended particles and after settlement, the supernatant water quality will be equivalent to the raw water quality.

The schematic of the proposed system is shown below:

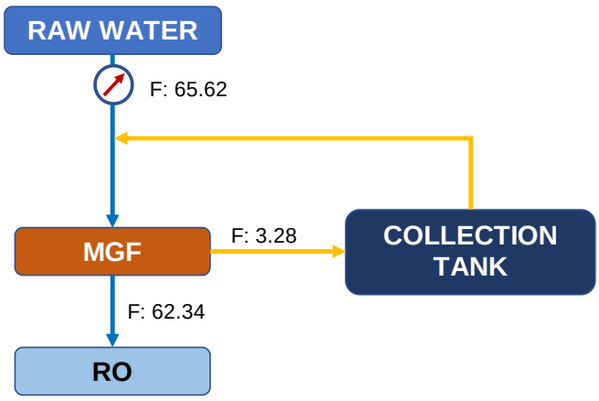


Figure 6.2: Schematic of proposed system of MGF Backwash

6.1.3 Benefits

The fresh water saving potential of about 3.28 m^3/day with cost benefit analysis as below.

Table 6.1 Cost – Benefits: Reuse of filter backwash (MGF) water after settlement in a settling tank

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 20/m^3**
Daily water savings	m^3/day	3.28
Annual water savings	m^3/year	1197.2
Annual cost Savings	Rs. Lakhs	0.30
Investment Required	Rs. Lakhs	0.1
Payback	Months	4

*Calculated for 365 working days

6.2 Water Saving Proposal 2: Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup

6.2.1 Present Status

Presently the ETP treated water is being used for low end applications such as Ash handling, Gardening, Coal yard dust suppression, sprinkling on road etc. This water has great potential to reduce the freshwater makeup to the cooling tower.

The water reaching the ETP comprises of mostly cooling tower blowdown and water from the N-pit which is a combination of DM plant regeneration and MGF backwash.

6.2.2 Recommendation

It is recommended to install a 3 stage RO system with MEE system to treat excess ETP treated water which presently is being used for gardening.

The capacity of the RO should be 105 KLD or approximately 10 KL/h considering 10 hours working. The overall recovery of the system will be 95% and the remaining 5% would get converted to salt through MEE.

6.2.3 Benefits

The fresh water saving potential of about 100 m^3/day with cost benefit analysis as below.

Table 6.2 Cost – Benefits: Installation of RO+MEE plant for excess ETP treated wastewater for reuse as Cooling Tower makeup

Estimated Parameters	**Units**	**Based on Raw water cost @ Rs. 5/m^3 and wastewater treatment cost @Rs. 0.2/m^3**
Daily water savings	m^3/day	100
Annual water savings	m^3/year	36500
Annual cost Savings	Rs. Lakhs	1.89
Investment Required	Rs. Lakhs	100

7. Implementation Plan

To better understand and comprehensively assess the water usage in the various processes and explore possibilities of water saving, Bajaj Energy Limited and CII- Water Institute partnered to undertake a detailed water audit of the plant.

The previous chapter detailed out the water saving proposals along with the key recommendations and, costs and benefits to the plant from their adoption. This chapter summarizes the key points emerging along with the way forward towards formulation of a Water Efficiency Plan.

The summary of total water savings emanating from proposed water saving proposals is shown in table 7.1.

Table 7.1 Water saving projects: summary for recommendations

I	**Total Fresh Water Intake (Average)**	**3808.40 m^3/day**		
II	**Savings Achievable**	**103.28 m^3/day**		
	Water Saving Potential (%)	**2.71 %**		
Recommended Projects				
S.No.	**Proposed Schemes**	**Water Savings (m^3/day)**	**Cost Saving Gross (Lakhs)**	**Investment (Lacs)**
1	Reuse of filter backwash (MGF) water after settlement in a settling tank	3.28	0.3	0.01
2	Installation of RO plant for ETP treated wastewater for reuse as Cooling Tower makeup	100	9.13	100
Observations				
1	No smooth platform was present along the boundary of cooling tower sump to reclaim drifted water from the surface			

7.1 Conclusions

7.1.1 Conclusion 1

Water balance across the plant has been successfully achieved
Total consumption: 3808.40 m^3/day (Daily Average)

7.1.2 Conclusion 2

Strategies identified for reduction, reuse and recycle show:

- Around 2.71% saving can be achieved.
- Reduction in freshwater makeup for the cooling tower high potential to reduce overall groundwater withdrawal

7.1.3 Way Forward

❖ Prioritize projects

- Priority areas where immediate savings can be achieved include reuse of filter backwash water (MGF) after settlement in a settling tank.
- Installation of a RO system for treatment of ETP treated water has good potential to reduce the cooling tower freshwater makeup.
- Rainwater collection and harvesting is an important project and could be executed.
- Need to adopt schemes for water management and conservation (Recycle, Reuse and Reduce options)
- Identification of key resource person from concerned departments to lead the water conservation and management activities along with the Water Management department. (*immediate*)
- Plan implementation with time and target (management decisions) (strategically to continue)
- Monitor proposal-by-proposal

❖ Undertake regular water audit for streamlining the activity and sustaining benefits of the study in long run.

❖ Internal audits to be undertaken at Bajaj Energy Limited units; third party audits also recommended.

Annexure I: Data Received from Plant Team

Water Consumption data

S. No.	Description	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22
1	Borewell – 1	25727	9214	57228	81984	83134	60159	7415	0	0	8968	0	11444
2	Borewell – 2	86671	9369	19555	22447	29710	39327	7480	291	673	8501	99	11380
3	Borewell – 3	0	0	0	0	0	0	1495	0	4	3356	0	863

Steam Generation Data (April 2021 – March 2022)

	Steam Generation												
1	**Boiler-1**	83988	12544.9	54799	77019.96	84975	72799	5942	0	0	16435	0	9848
2	**Boiler- 2**	75719	11116	52023	73239.78	79028	68063	16501	0	0	15052	0	0

Piezometer Reading

DATE	TIME	WATER LEVEL (m)	
		GWR00168	GWR00196
10-05-2022	16:00:00	4.2	2.08
10-05-2022	15:00:00	4.2	2.08
10-05-2022	14:00:00	4.19	2.15
10-05-2022	13:00:00	4.17	2.11
10-05-2022	12:00:00	4.14	2.12
10-05-2022	11:00:00	4.13	2.06
10-05-2022	10:00:00	4.12	2.12
10-05-2022	09:00:00	4.12	2.21
10-05-2022	08:00:00	4.12	2.24
10-05-2022	07:00:00	4.11	2.51
10-05-2022	06:00:00	4.11	2.57
10-05-2022	05:00:00	4.11	2.54
10-05-2022	04:00:00	4.12	2.51
10-05-2022	03:00:00	4.13	2.48
10-05-2022	02:00:00	4.12	2.41
10-05-2022	01:00:00	4.13	2.37
10-05-2022	00:00:00	4.13	2.27
09-05-2022	23:00:00	4.13	2.24
09-05-2022	22:00:00	4.13	2.23
09-05-2022	21:00:00	4.14	2.21
09-05-2022	20:00:00	4.14	2.2
09-05-2022	19:00:00	4.16	2.13
09-05-2022	18:00:00	4.19	2.06
09-05-2022	17:00:00	4.2	2.09
09-05-2022	16:00:00	4.2	2.09
09-05-2022	15:00:00	4.19	2.09
09-05-2022	14:00:00	4.19	2.09
09-05-2022	13:00:00	4.18	2.1
09-05-2022	12:00:00	4.15	2.05
09-05-2022	11:00:00	4.13	2.12
09-05-2022	10:00:00	4.13	2.13
09-05-2022	09:00:00	4.13	2.19
09-05-2022	08:00:00	4.13	2.25
09-05-2022	07:00:00	4.12	2.46
09-05-2022	06:00:00	4.13	2.52
09-05-2022	05:00:00	4.13	2.5
09-05-2022	04:00:00	4.14	2.51
09-05-2022	03:00:00	4.14	2.5
09-05-2022	02:00:00	4.14	2.49
09-05-2022	01:00:00	4.14	2.46
09-05-2022	00:00:00	4.14	2.42

Annexure II: Minimum Water Requirements

Annexure-2: Minimum Water Requirement
In view of the Gazette of India Notification Part II- Section 3 – Sub-section (ii) (CG-DL-E-24092020-221952, No. 2941), dated September 24, 2020, " All industries abstracting ground water in excess of 100 m3 /d shall be required to undertake annual water audit through Confederation of Indian Industry (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/PHDCCC certified auditors and submit audit reports within three months of completion of the same to CGWA".
An attempt was made to understand the minimum water required for regular plant operations.
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE vide its notification dated 7th Dec 2015 has issued new norms for water consumption limit for thermal power plants. New norms applicable to BEL plants is 3.5 m3/MWH.
The specific water consumption for Bajaj Energy Limited, Maqsoodapur, Shahjahanpur is 2.91 m3/MWh of power generated (April 2021 - March 2022) Since the plant was running at less than the full load due to COVID-19 pandemic and coal shortage, approximately 5331.76 m3/day (average of April 2021 - March 2022) of water was being used for the plant operations.
The details of NOC for withdrawal of ground water are as under:

Water withdrawal permission as per CGWA NOC - BEL Maqsoodapur				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
13	Application no. SHJP0621RIN0027	378000	KL/Annum	
14	Application no. SHJP0621RIN0038	756000	KL/Annum	
15	Application no. SHJP0621RIN0039	972000	KL/Annum	
16	Total water withdrawal NOC	2106000	KL/Annum	
E	**Permissible water withdrawal at 100% load**	**7020.0**	**KL/day**	**300 days working**
F	**Permissible water withdrawal at 70% load**	**4914.0**	**KL/day**	**300 days working**
Condition A: Plant working at 100% load condition				

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
1	Design recirculation rate	17200	m3/h	
2	Actual recirculation rate	**16104**		
3	COC	7		
4	Temperature difference	10		

5	Evaporation loss	5913	m3/day	
6	Drift Loss	77.3	m3/day	considering 0.02%
7	Blowdown	985.6	m3/day	
A	**Total makeup to the cooling circuit**	**6976.3**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
8	Total Staff Strength	160	Nos.	
9	Floating population	50	Nos.	
10	Recommended domestic water consumption	30	LPCD	
11	Total Domestic water consumption	6.3	m3/day	
12	Considering 15% extra	7.2	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**70**	**m3/day**	

D	**Total Minimum water requirement at 100 % load**	**7053.5**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
13	Cooling tower blowdown	985.6	**m3/day**	
14	Permeate recycled in cooling tower	591.3	**m3/day**	
15	Reject	394.2	**m3/day**	The reject will be used for dust suppression & ash quenching
16	New minimum water demand at 100% load	6462.2	**m3/day**	
17	Saving potential over NOC quantity	7.95%		

Case-2 : Saving potential with COC increased to 9				
18	COC	9		
19	Blowdown	739.2	**m3/day**	
20	Permeate recycled in cooling tower	443.5	**m3/day**	60% recovery

21	Reject	295.7	**m3/day**	The reject will be used for dust suppression & ash quenching
22	New minimum water demand at 100% load	6363.6	**m3/day**	
23	Saving potential over NOC quantity	9.35%		
Maximum saving possible at 100% load is 9.35% over NOC quantity				

Condition B: Plant working at 70% load condition

Cooling Tower calculations				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
24	Design recirculation rate	17200	m3/h	
25	Actual recirculation rate	**11438**		
26	COC	7		
27	Temperature difference	10		
28	Evaporation loss	4200.0	m3/day	
29	Drift Loss	54.9	m3/day	considering 0.02%
30	Blowdown	700.0	m3/day	
A	**Total makeup to the cooling circuit**	**4954.9**	**m3/day**	

Domestic - Potable Water				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
31	Total Staff Strength	160	Nos.	
32	Floating population	50	Nos.	
33	Recommended domestic water consumption	30	LPCD	
34	Total Domestic water consumption	6.3	m3/day	
35	Considering 15% extra	7.2	m3/day	
B	**Domestic Water Requirement**	**7**	**m3/day**	

Feed to DM plant for DM water generation				
Sno.	**Description**	**Value**	**Unit**	**Remarks**
C	**Feed to DM plant**	**70**	**m3/day**	

D	**Total Minimum water requirement**	**5032.2**	**m3/day**	**D=A+B+C**

Case-1: The plant is in process of installing a RO system to treat cooling tower blowdown and use the permeate as feed to the cooling tower and Below will be the effect of installation of a wastewater RO system considering 60% recovery & COC of 7				
36	Cooling tower blowdown	700.0	**m3/day**	
37	Permeate recycled in cooling tower	420.0	**m3/day**	60% recovery
38	Reject	280.0	**m3/day**	The reject will be used for dust suppression & ash quenching
39	New minimum water demand at 100% load	4612.2	**m3/day**	
40	Saving potential over minimum water requirement	8.35%		Considering same COC
41	Saving potential over NOC quantity	6.14%		

Case-2 : Saving potential with COC increased to 9				
42	COC	9		
43	Blowdown	525.0	**m3/day**	
44	Permeate recycled in cooling tower	315.0	**m3/day**	
45	Reject	210.0	**m3/day**	The reject will be used for dust suppression & ash quenching
46	New minimum water demand at 100% load	4542.2	**m3/day**	
47	Saving potential over minimum water requirement	9.74%		Considering COC of 9
48	Saving potential over NOC quantity	7.57%		

Maximum saving possible at partial load is 7.57%

Annexure III: CGWA NOC for Groundwater Extraction

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)
[See rules 15(2)]
(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)
VALID UP TO : 20/08/2026

Registration No.: 202106000472			
Name of the Owner	SAMIR KUMAR SABAT		
Address of the Applicant	Bajaj Energy Limited Maqsoodapur	**Application Form Serial No.**	SHJP0621RIN0039
Date of Submission	21/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Maqsoodapur	**Company Address**	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,
NOC Issued By: अनापत्ति प्रमाण पत्र (द्वारा निर्गत)			
Central Ground Water Authority केन्द्रीय भूगर्भ जल प्राधिकरण			Yes
Certificate Number प्रमाणपत्र संख्या	CGWAINDProj2018325R	**Issue Date** निर्गमन तिथि	19/09/2018
Expiry Date अंतिम तिथि	28/08/2021		
Ground Water Department Uttar Pradesh भूगर्भ जल विभाग उत्तर प्रदेश सरकार			No
Location Particulars			
District	Shahjahanpur	**Block**	BUNDA
Plot No./Khasra No.	43, 42, 5	**Municipality/Corporation**	No
Ward No./Holding No.			NA
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	28/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		28/10/2011	

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)
[See rules 15(2)]
(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)
VALID UP TO : 20/08/2026

Registration No.: 202106000470			
Name of the Owner	SAMIR KUMAR SABAT		
Address of the Applicant	Bajaj Energy Limited Maqsoodapur	**Application Form Serial No.**	SHJP0621RIN0038
Date of Submission	21/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Maqsoodapur	**Company Address**	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,
NOC Issued By: अनापत्ति प्रमाण पत्र (द्वारा निर्गत)			
Central Ground Water Authority केन्द्रीय भूगर्भ जल प्राधिकरण			Yes
Certificate Number प्रमाणपत्र संख्या	CGWAINDProj2018325R	**Issue Date** निर्गमन तिथि	19/08/2018
Expiry Date अंतिम तिथि	28/08/2021		
Ground Water Department Uttar Pradesh भूगर्भ जल विभाग उत्तर प्रदेश सरकार			No
Location Particulars			
District	Shahjahanpur	**Block**	BUNDA
Plot No./Khasra No.	43, 42, 5	**Municipality/Corporation**	No
Ward No./Holding No.			NA
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	28/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		28/10/2011	

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GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICAT NO:
VALID UP TO : 20/08/2026

Name of the Applicant	SAMIR KUMAR SABAT		
Address of the Applicant:	Bajaj Energy Limited Maqsoodapur		
Company Name:	Bajaj Energy Limited Maqsoodapur	**Company Address**	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,
Serial No. of Application Form	SHJP0621NIN0027	**Date of Submission**	22/06/2021
Specimen Signature of the User:			
Location particulars:			
District	Shahjahanpur	**Block**	BUNDA
Plot No.	43, 42, 5		
Municipality/Corporation	No	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	16/03/2020
Particular of the Proposed Well and Pumping Device			
Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	30.00	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	30.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:			378000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours I day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Not Valid as Water Extraction Fee is Pending

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Annexure IV: Drinking water standard IS 10500 (2012)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 3.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 5 Pesticide Residues Limits and Test Method
(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

Annexure V: IS 1172: 1993 Code of Basic Requirements for water supply, drainage and sanitation

A general rule the following rates per capita per day may be considered minimum for domestic and non domestic needs:

1) For communities with population up to 20 000 and without flushing system

   a) water supply through standpost — 40 lphd (*Min*)

   b) water supply through home service connection — 70 to 100 lphd

2) For communities with population 20 000 to 100,000 together with full flushing system — 100 to 150 lphd

3) For communities with population above 100 000 together with full flushing system — 150 to 200 lphd

NOTE — The value of water supply given as 130 to 200 litres per head per day may be reduced to 135 litres per head per day for houses for Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions.

4.1.1 Out of the 150 to 200 litres per head per day, 45 litres per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

4.2 Water Supply for Buildings Other Than Residences

Minimum requirements for water supply for buildings other than residences shall be in accordance with Table 1.

Table 1 Water Requirements for Buildings Other than Residences

Sl No.	Type of Building	Consumption Per Day, litres
(1)	(2)	(3)
i)	Factories where bath rooms are required to be provided	45 per head
ii)	Factories where no bath rooms are required to be provided	30 per head
iii)	Hospital (including laundry) :	
	a) Number of beds not exceeding 100	340 per head
	b) Number of beds exceeding 100	450 per head
iv)	Nurses' homes and medical quarters	135 per head
v)	Hostels	135 per head
vi)	Hotel	180 per head
vii)	Offices	45 per head
viii)	Restaurants	70 per seat
ix)	Cinemas, concert halls and theatres	15 per seat
x)	Schools:	
	a) Day schools	45 per head
	b) Boarding schools	135 per head

NOTE — For fire demand in buildings refer IS 9668 : 1981.

5 DRAINAGE AND SANITATION REQUIREMENTS

5.1 General

There shall be at least one water tap and arrangements for drainage in the vicinity of each water-closet or group of water-closets in all buildings.

5.2 Residences

5.2.1 Dwellings with individual conveniences shall have at least the following fitments:

a) One bath room provided with a tap,

b) One water-closet, and

c) One nahani or sink either in the floor or raised from the floor with a tap.

Where only one water-closet is provided in a dwelling, the bath and water-closet shall be separately accommodated.

NOTE — Water-closets, unless otherwise indicated, shall be of Indian style (squatting type).

5.2.2 Dwellings without individual conveniences shall have the following fitments:

a) One water tap with draining arrangement in each tenement,

b) One water-closet and one bath for every two tenements, and

c) Water taps in common bath rooms.

5.3 Buildings Other Than Residences

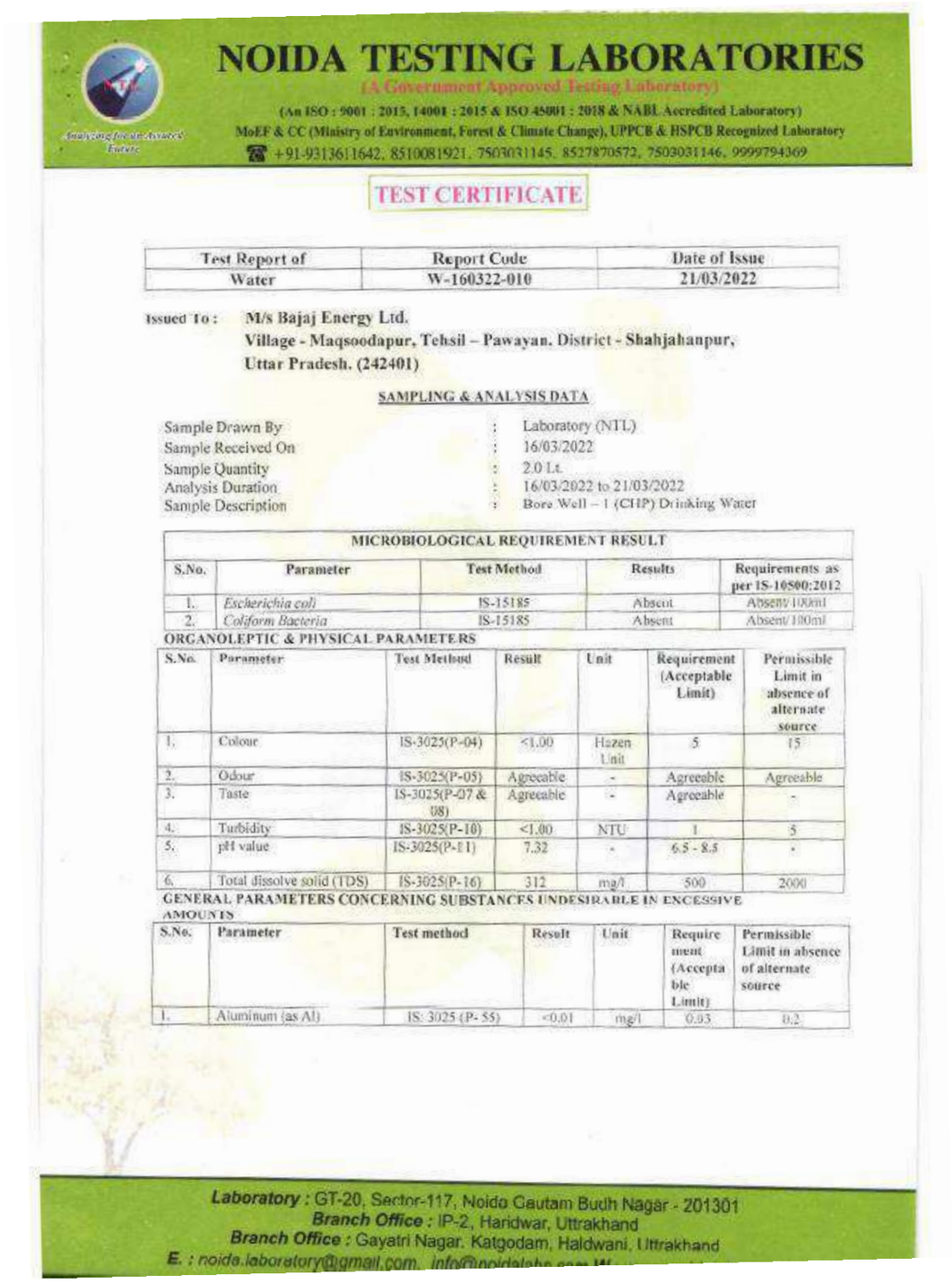
The requirements for fitments for drainage and sanitation in case of buildings other than residences shall be in accordance with Tables 2 to 12.

6 WATER SUPPLY, DRAINAGE AND SANITATION REQUIREMENTS FOR RAILWAY PLATFORMS, BUS STATIONS, BUS TERMINALS AND AIRPORTS

6.1 General

The water supply, drainage and sanitation requirement specified in 6.2 to 6.4 for railway stations, bus stations, bus terminals, sea ports

Annexure VI: Groundwater & Wastewater Quality test reports



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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-160322-010	21/03/2022

Issued To : M/s Bajaj Energy Ltd.
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 16/03/2022
Sample Quantity : 2.0 Lt.
Analysis Duration : 16/03/2022 to 21/03/2022
Sample Description : Bore Well – 1 (CHP) Drinking Water

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-15185	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-15185	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.32	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	312	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
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2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS: 13428	<0.20	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	2.4
6.	Calcium (as Ca)	IS: 3025 (P- 40)	46.50	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<0.001	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	12.80	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.26	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.145	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	23.10	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Cause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.02	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	24.60	mg/l	200	400
20.	Sulphidous H-S	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	176.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	258.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P-49)	<0.2	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.02	mg/l	0.05	No Relaxation

BDL: Below Detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The statement valid for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be produced again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless any specific requirement.

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AUTHORIZED SIGNATORY

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Branch Office : Gayatri Nagar, Katgodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com W. : www.noidalabs

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-160322-08	21/03/2022

Issued To : **M/s Bajaj Energy Ltd.**
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On	:	16/03/2022
Sample Drawn By	:	NTL
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	16/03/2022 to 21/03/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part 11):1983	7.25	-
2.	Total Suspended Solid (TSS)	IS:3025(Part-17):1984	17.8	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	89.0	mg/l
4.	Biological Oxygen Demand (as O_2) (3 days at 27^{0C})	IS:3025(Part-44):1993	14.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	2.6	mg/l

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-160322-09	21/03/2022

Issued To : **M/s Bajaj Energy Ltd.**
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On	:	16/03/2022
Sample Drawn By	:	NTL
Sample Description	:	ETP Outlet
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	16/03/2022 to 21/03/2022

TEST RESULTS

S.No.	Parameter	Test Method	Results	Limit as per CPCB Norms
1.	pH	IS:3025(P-11)	6.80	5.0-9.0
2.	Total Suspended Solid (TSS)mg/l	IS:3025(P-17)	6.2	100
3.	Chemical Oxygen Demand (as O_2) mg/l	APHA 5220 B-2005	58.0	250
4.	Biological Oxygen Demand (as O_2) mg/l	IS:3025(P-44)	6.6	30
5.	Oil & Grease (mg/l)	IS:3025(P-39)	<1.0	10

EPA- Environmeatal Protection Act-1986

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-160322-036	21/03/2022

Issued To : M/s Bajaj Energy Ltd.
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On : 16/03/2022
Sample Drawn By : NTL
Sample Description : STP Inlet
Sample Quantity/Packing detail : 1 litre pet bottle
Analysis Duration : 16/03/2022 to 21/03/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11)	6.28	-
2.	Total Suspended Solid	IS:3025(Part-17)	7.0	mg/l
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	78.0	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	10.0	mg/l
5.	Oil & Grease	IS: 3025 (P- 39)	2.4	mg/l
6.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	1.6×10^4	-

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-160322-037	21/03/2022

Issued To : M/s Bajaj Energy Ltd.
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On : 16/03/2022
Sample Drawn By : NTL
Sample Description : STP Outlet
Sample Quantity/Packing detail : 1 litre pet bottle
Analysis Duration : 16/03/2022 to 21/03/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11)	7.55	-	5.5-9.0
2.	Total Suspended Solid	IS:3025(Part-17)	6.4	mg/l	100 max
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	47.0	mg/l	No limit Specified
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	5.5	mg/l	30max
5.	Oil & Grease	IS:3025(Part-39)	<1.0	mg/	No limit Specified
6.	Faecal Coliform (MPN/100ML)	IS: 1622.1981	170	-	<1000 MPN/100ML

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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Annexure VII: Water Saving Gadgets

Electronic Taps (e-taps)

The latest trend in industries is to install electronic taps (e-taps). The advantages of using e-taps are as mentioned below:

- Unlike conventional taps, there is no twisting or turning in e-taps. They have a sensor, which cuts off water supply completely when not in use. This helps in saving up to 70% water during hand wash

- E-taps enable hands free operation. No fear of cross contamination or contact with germs. E-taps score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.

- E-taps can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.

- The touch free electronic taps, available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Operation of Electronic Taps

This has been successfully implemented in several hotels & restaurants. Of late, several industries have also started implementing this proposal.

Thus, there is a good potential to optimize the freshwater consumption by replacing the existing taps with e-taps.

Electronic flush (e-flush) urinals

The latest trend in industries is to install e-flush urinals. The advantages of using e-flush urinals are as mentioned below:

- E-flush urinals are fitted with a sensor, which senses the usage and flush with water for few seconds after use. This helps in saving 70% water during urinal flush
- E-flush urinals enable hands free operation and score very high on hygiene. It is the most ideal choice for multipurpose and multiuser washrooms.
- E-flush urinals can work efficiently up to raw water TDS of 1800 ppm. The raw water TDS is less than 1800 ppm.
- The touch free e-flush urinals available in AC and DC models consume minimal power only. The AC model has an efficient battery back-up, while the DC model runs on just 4 alkaline batteries.





Photographs: Electronic flush urinals

Waterless urinals

Waterless urinals eliminate 100% water usage in urinal flush. The concept is based on blue seal technology. The patented blue seal density is lesser than urine and hence allows the passage of urine and acts as a protective layer. The blue seal also eliminates odour emanating from urine. The blue seal is bio-degradable and has to be replaced once in 5000-7000 usages.






Photographs: waterless urinals

Hand wash
NEERR nozzles

Demonstration conducted at a site showed a water saving of 92.18% in the mist mode, 85% in the foam mode and 60% with the normal aerator nozzle.



Photographs: Basic Aerator, NEERR nozzle: Foam Mode and NEERR nozzle: Mist Mode

Thus, 85% water saving can be assumed though installation of these NEERR nozzles.

Technical details about the product: NEERR[2] nozzles are based on water A.R.T. (Atomizer Reduction Technology)[3], which atomizes the water and creates a heavy mist, hence reducing the consumption in any washing application by up to 95%. There are two modes available in the same nozzle:

Mist Mode: Saves up-to 95% water (at 3 bar pressure). It is perfect for daily utility activities like brushing, washing dishes etc.

Normal Mode: With a twist, Neerr switches to normal mode, which still saves up to 75% water (at 3 bar pressure). It is more useful while filling glasses, pots etc.

Installation: Retrofits into the existing tap**;** Unscrew the existing aerator and insert the Neerr Nozzle.

Dimensions: Fits Standard (20.8 mm), Junior (18.1 mm) and Tom Thumb (15 mm) sized taps (inner socket dimension)

Material: Lead Free Brass (Chromed Handles)

Water Pressure: 1.2 – 8bar. (Suitable for low pressure water systems).

Water Temperature: Max 192 degree F / 89 degree C

[2] NEERR^{TM} is a product innovated by ZeFi Labs with RETAS as Marketing Partner
[3]It is a patent pending technology by ZeFi Labs

Foam taps

Conventional taps are used in the hand wash areas which results in large quantity of fresh water. Foam taps are a better fit in these high consumption areas. They consume 25-30% less than the conventional taps.





Photographs: Foam taps

Spring loaded Push taps

Spring loaded push type tap is an alternate device for minimizing hand wash Water. The spring-loaded push taps operate with the simple mechanism of pressing the knob for water. The knob automatically released back to close position in 5-7 seconds. This saves about 30-40% of water compared to the conventional taps





Photographs: Spring loaded push taps

Low flush cistern

The latest model closets are water efficient and operate in dual mode with single flush releases 2 liters and dual flush releases 4 liters per flush. This results in large quantity of water savings.





Photographs: Low flush cisterns

Annexure VIII: Suggestive List of Vendors for providing water saving equipment/technology/consultancy

a. Supplier Addresses of Water & Wastewater Treatment Systems and Water Saving Devices

1. Hitech Enviro Engineers & Consultants Pvt. Ltd.
Address: Plot No : A-1, Ground Floor,
Kaushambi, Ghaziabad – 201010
Tel: 0120– 4294461-63,
Fax: 0120- 4294462
Email: projects@heecpl.com
Website: www.heecpl.com
Contact Person: Mr. Hitesh Mittal (Director)

2. Arvind Envisol Ltd.,
Address: Naroda Road, Ahmedabad,
Gujarat-380025
Tel: 079 30138000
Fax: 079 30138677
Email: ashini.shah@arvind.in
Website: www.arvind.com
Contact Person: Mr Ashini Shah

3. GE India Industrial Pvt. Ltd
Address: Building No 7A, 5th Floor DLF Cyber City,
DLF Phase III, Sector 25A, Gurgaon
Haryana – 122002
Tel: 0124 4808016
Mobile: 09999907981
Email: himanshu.gupta@ge.com
Contact Person: Mr Himanshu Gupta

4. Genesis Membrane Sepratech Pvt. Ltd
Address: No18, Vardhaman Complex
No 10, L.B.S Marg, Vikhroli (West)
Mumbai – 400 083
Tel: 022-5775456 / 5775458
Fax: 022-5790608
Mobile: 9322229520
Email: genesis@bom5.vsnl.net.in
Contact Person: Dr BibhashChakravorty

5. **Ion Exchange India Ltd**
Address: Block B, Flat No.8, Local Shopping Center
Ring Road, NarainaVihar
New Delhi - 110 028
Tel: 011 2577 1160/0862/6061/6065
Fax: 011 2577 4837
Email:delcro@ionexchange.co.in

6. **Jindal Water Infrastructure Ltd**
Address: Jindal ITF Centre, 28 ShivajiMarg, New Delhi 110015
Telephone: 011-45021983, 45021984
Fax: 011-45021982
Email: info@jindalaquasource.com
Website: www.jindalaquasource.com
Contact Person: Mr SudhirMalhotra, Sr Vice President

7. **Doshi Ion Exchange & Chemical Industries Limited**
Address: C – 147, Madhuban
Near Universal Public School
New Delhi 110092, India
Tel: +91-11-22502064 / 22022175
Fax: +91-11-22044979
Email: delhi@doshion.com

8. **Max Pure Water Systems**
Address: Near Bharat Petrol Pump,
Opposite Bharat Cancer Hospital,
Kumbharia Road, Saroli, Surat. Gujarat
Telephone: 0261-264 3894
Fax: 0261-264 0034
Mobile: 98980 43960, 98980 41900
E-mail: maxpurero@gmail.com; info@maxpurero.com
Website: www.maxpurero.com
Contact Person: Mr. Kailash Shah, Director

9. **Chempure Technologies Pvt Ltd**
Address: 28/1, Manjolai 2nd Main Road
Kalaimagal Nagar Extn., Ekkaduthangal
Chennai – 600097
Tel: 044-22250173 / 22250162
Fax: 044-22250867
Mobile: 9444076114
Email: chempure@vsnl.net
Contact Person: Mr Leo Vino

10. **Pentair Water India**
    Address: L/52-55, Verna Industrial Estate
    Verna, Salcette
    Goa – 403 722
    Tel: 0832-2883300
    Fax: 0832-2883312
    Contact Person: Mr MritunjayChaubey

11. **Nuchem Weir India Limited**
    Address: E-46/12, Okhla Industrial Area,
    Phase - II , New Delhi - 110 020
    Tel: 26385737, 26383234, 26384656
    Fax: 51611846
    Manager-Water Treatment
    Email: msakhtar@nuchemweir.com
    Contact Person: Mr M.S.Akhtar

b. Flow Meters (Fixed/Portable)

1. **Forbes Marshall Pvt. Ltd.**
    Address: A-34/35, MIDC, H Block,
    Pimpri, Pune-411018, Maharashtra
    Telephone: 020-2744 2020
    Fax: 020-2744 2420, 2040
    Mobile: 98505 67714
    E-mail: rmishra@forbesmarshall.com
    Website: www.forbesmarshall.com
    Contact Person: Mr Rakesh Mishra,
    Head - Water Business

2. **Iota Flow Systems Pvt Ltd**
    Address: A-2/13 Phase II ,Industries Area,
    Maya Puri, New Delhi - 1100 064
    Tel.: 91-11-46254601-08 Extn 17
    Moblie: 09958609393
    Fax: 91-11-46880020
    Email: sunil@iotaflow.com
    Contact Person: Mr Sunil Yadav

3. **GE India Industrial Pvt. Ltd**
    Address: Building No 7A, 5th Floor DLF Cyber City,
    DLF Phase III, Sector 25A, Gurgaon
    Haryana – 122002
    Tel: 0124 4808016
    Email: Srikanth.Kommu@ge.com

Contact Person: Mr Srikanth Kommu

4. **Rockwin Flowmeter India Pvt Limited**
   Address: B-24, Site IV,
   Sahibabad Industrial Area,
   Ghazibad-201010, Uttarpradesh
   Tel: 0120-2895400, 2896286, 2895079
   Fax: 0120-2895450
   Mobile: 9810129687, 9331052312, 9381026604
   E-mail: rajiv@rockwin.com; Mumbai@rockwin.com; rockwinkolkata@vsnl.net; rockwinchennai@vsnl.net
   Website: www.rockwin.com
   Contact Person : Mr Rajiv Prakash

5. **Orbit Technologies Pvt. Ltd.,**
   Address: B-50, Sanathnagar Industrial Area,
   Hyderabad-500018
   Ph: 040-67216354
   Fax: 040-23801579
   Email : orbit@orbitindia.com
   Website :www.orbitindia.com

c. **Water Saving Gadgets (e-flush, e-taps, Foam taps, dual flush cisterns & low flow showers)**

1. **Hindustan Sanitary ware & Industries Ltd.**
   Address: Tewari House, 2nd Floor, 11 - B / 8
   Main Pusa Road, New Delhi - 110005
   Tele Phone: 011 - 2585 4656
   E-mail: nitinkulkarni@hindware.co.in
   Contact Person: Mr. Nitin Kulkarni, Head,
   Institutional Sale & Business Development

2. **Jaguar & Company Limited**
   Address: 306, Udyog Vihar,
   Phase-II, Gurgaon (INDIA)
   Hand Phone: 098110 23782
   E-mail: bandu@jaguar.com
   Contact Person: Mr.Bandhu,
   Asst. Manager Production

3. **Kohler India**
   Tele Phone : 0124 - 4319 685 / 86
   E-mail : indiacustomercare@kohler.com

4. **Parryware Roca Pvt. Ltd.**
   Address: 234, N.S.C. Bose Road,
   Dare House, 4th Floor, Chennai -600 001
   Tele Phone: 044 - 25306341
   Hand Phone: 98401 00544
   Fax: 044 - 25340034
   E-mail: muralit@parry.murugappa.com
   Website: www.parrywareroca.com
   Contact Person: Mr. T.Murali,
   Area Head (Institutional Sales)

5. **Viega International** - GEM Sanitary Appliances Pvt. Ltd.
   Address: A-57, Wazirpur Industrial Area, Delhi - 110 052
   Tele Phone: 011 - 2737 7802 / 03 / 05
   Hand Phone: 098101 56083
   Fax: 011 - 2737 7806
   E-mail: gemsanitary@vsnl.com
   Contact Person: Mr. C.S. Gupta

6. **BVG Falcon**
   Address: Hyderabad
   Tele Phone: 040 - 2309 5499
   Hand Phone: 98480 55507
   Contact Person: Mr.Goel, Director
   Head Institutional Sale & Business Development

d. Cooling Tower Equipments:

1. **Kemco Technologies India Private Limited**
   Suite 906, Surya Kiran,
   19 Kasturba Gandhi Marg,
   New Delhi 110001, India
   Tel: +91 11 4151 1177
   Fax: +91 11 4151 8989
   Mobile: +91 9364204800
   Email: junsodsod@kemcosc.com

2. **Raj Heat Exchangers & Cooling Towers**
   Address: 190-1/4, Sai Nagar,
   Sidco Industrial Estate (P.O.),
   Coimbatore-641021, Tamil Nadu
   Telephone: 0422-2672615, 2672592
   Mobile: 9443820160
   E-mail: info@rajheat.com
   Website: www.rajheat.com

Contact Person: Mr Nagarajana

3. **Sanosil Biotech Pvt. Ltd.**
   Address: Warden House, Sir P M Road, Fort, Mumbai-400001
   Telephone: 022-2287 2295
   Fax: 022-2287 3475
   E-mail: info@sanosilbiotech.com
   Website: www.sanosilbiotech.com

4. **Aquazone Systems & Engineering**
   Address: 1, Yash Plaza,
   25 Archna Industrial Estate,
   B/h. Nilkanth Hotel, Opp. Bharat
   Bobbins, 132 Ft. Ring Road,
   Ajit Mill, Rakhial,
   Ahmedabad-380023, Gujarat
   Telephone: 079-2909 2182
   Fax: 079-2909 2182
   Mobile: 98242 65617, 94277 02867
   E-mail: ozone@ozoneworld.com;
   ozonators@rediffmail.com;
   ozoneworld@gmail.com
   Website: www.ozoneworld.com

5. **Mm Aqua Technologies Ltd**
   Address: Behrampur Road, Khandsa,
   Gurgaon-122001, Haryana
   Telephone: 0124-221 4134
   Fax: 0124-426 5020
   E-mail: info@mmaqua.com
   Website: www.mmaqua.com
   Contact Person: Mr Santanu Paul, Manager

6. **Ozonetek Limited**
   Address: 30 Landons Road,
   Chennai-600010
   Telephone: 044-2641 4717, 18, 19
   Fax: 044-26414720
   E-mail: info@ozonetek.com; ozonetek@vsnl.com; support@ozonetek.com;
   kpatel@ozonetek.com
   Website: www.ozonetek.com
   Contact Person: Mr Dr K. Patel, Managing Director

7. **Cook Deck Aqua Solutions Pvt. Ltd.**
   Address: 121, Andheri Industrial Premises,
   Off Veera Desai Road, Andheri West,
   Mumbai-400053, Maharashtra
   Telephone: 022-6725 1401,
   2850 3670, 2850 5767
   Fax: 022-2673 1820
   Mobile: 98960 11623, 98201 06694
   E-mail: kpgwalani@cooldeckin.com;
   harsh@cooldeckin.com;marketing@cooldeckin.com
   Website: www.cooldeckin.com
   Contact Person: Mr K P Gwalani, Proprietor
   Mr Harsh Bhargava, Director

8. **Adwyn Chemicals Pvt. Ltd.**
   Address: 154-A, Pocket-1, Mayur Vihar, Phase-1, Delhi-110091
   Telephone: 011-2279 3281, 2275 7974
   Fax: 011-2275 7974, 2275 3765
   Mobile: 98101 74794
   E-mail: adwynchemicals@yahoo.co.in; adwyn@vsnl.com
   Contact Person: Mr Aditya Gupta, Director

Annexure IX: Guidelines for installation of Flow meter on Borewells

Digital Water Flow Meter with Telemetry for Groundwater extraction monitoring as per CGWA notification

Technical specifications

1. Specification of Tamper proof Electronic water meter with telemetry

Metering Technology	: Ultrasonic or Electromagnetic
Communication type	: LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G)
Tamper proof:	
a) Power source	: The meter shall be battery operated or UPS powered supply with provision of power OFF detection. The telemetry system units shall be battery operated or through external power supply. The metering data should be stored in the meter even if the telemetry system is off due to power failure.
b) Sealing	: The meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
Compliance	: The meter shall preferably be manufactured as per ISO 4064: 2014 Standards and shall have IP 68 ingress protection.
Accuracy	: The meter shall be of accuracy better than ± 2% for the operating flow range (from 10 % to 100 % of maximum flow rate).
Test certificate	: The meter manufacturer shall submit the latest test/calibration certificate of the meter, from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL) or any third party laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), for every meter.
Parameters to monitor	: The meter (since installation of the requisite water meter) shall transmit the following parameters to a

	secure cloud • Timestamp • Cumulative forward flow volume • Cumulative reverse flow volume • Cumulative Net volume • Cumulative pump working hours • Meter serial number • Device last calibration date • Borewell id (Provided by CGWA)
Cloud	: The Communication / telemetry data should be directly captured in a secure cloud. The cloud service provider should be empaneled with The Ministry of Electronics and Information Technology (MeitY).
Transmission frequency	: The data shall be transmitted minimum 2 times in a day
Battery life	: In case of battery operated meters the battery shall run at least for a period of 3 years with 2 transmissions per day. The battery shall be replaceable without any data loss.
Data acquisition	: The meter shall be supplied with complete AMR / AMI system with Data Management software. The Data Management Software must be capable of running on a standard PC. The Data Management Software should be cloud based and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.
Real-time data to CGWA	: The un-tampered data from the secure cloud shall be sent to Central Ground Water Authority (CGWA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.

2. Installation of meter

Location	: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure. 1
Bypassing	: There shall be no bypassing of pipe prior to the installed flow meter.
Full flow	: The installation of the meter shall ensure the pipe shall have full of water at all times. Sufficient upstream and downstream straight length shall be provided for the meter (Refer to Figure 1.)

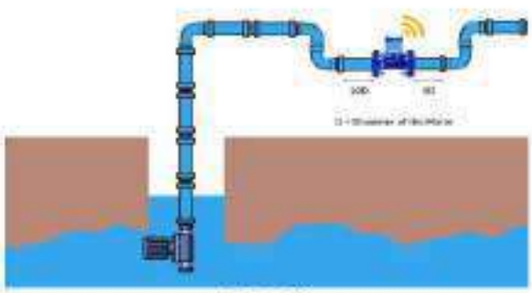


Figure. 1

Installation position of tamper proof flow meter with telemetry at groundwater abstraction structures.

3. DETAILED TECHNICAL SPECIFICATIONS OF AMR / AMI WATER FLOW METERS

3.1 Specification of flow meter

Flow meters shall meet the following metrological specification:

Turndown ratio of 10 or above
Accuracy ± 2%
Technology: electromagnetic or ultrasonic

3.1.1 Size:

1. DN40 - Flow range: 0.5 lps to 5 lps
2. DN100 - Flow range: 3 to 30 lps
3. DN150 - Flow range: 13 to 130 lps

Meter performance shall not get affected by external magnetic field, as specified in ISO4064.

Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.

3.1.2 Material of Construction:

The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per applicable standards (referred above).

- The water meter and accessories shall be manufactured from materials of adequate strength and durability.
- The body of the meter shall be of Brass/Bronze/MS/CI/SS/Engineering Plastic and compact enough to avoid tampering of meter. The manufacturer shall specifically mention in the offer, the material used in manufacturing.
- The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste, odor or discoloration in the water supply.
- The painting material used should be free from toxic constituents and safe for human uses and should not affect human health (Health Certificate should be attached/provided).
- Each meter should be supplied in separate individual box with its accessories, test/ calibration Certificate (for accuracy parameter) and Guarantee Card for free repair/replacement during the warranty period.

3.1.3 Markings on the Body of the Meter:

- Make/Brand, Size / Nominal Dia.
- Sl. No. / Year of Manufacture, Metrological specifications etc.

3.1.4 Meter indicator

The digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.

- It shall be of straight reading type
- No. of digits and verification scale interval shall be as sufficient enough to meet the required accuracy.
- Totalizer shall be made of suitable material required to maintain IP 68 protection class.

3.2 Telemetry System

- The AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering etc. along with necessary alarms.
- The system will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.
- The battery shall be replaceable without any data loss.
- The meters should report an alarm to the server as and when tampered.
- All Water Meter readings should be time stamped.
- The meter should have the capability to detect and record reverse flow separately.
- The meter should be capable of to detect Leak, Zero (No) Flow, High Flow.
- The AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The AMR/AMI should function even in the presence of high voltage power lines.
- Battery usage has to be indicated at the server. Provision should be provided to replace batteries if required.
- The communication shall be encrypted to avoid tampering.
- The meter should be configurable either using the DTU or from the server.
- Loss of communication should be indicated in the server within 48 hours.
- The meter should be able to log the daily flow data with a timestamp which is supposed to be sent to the cloud via telemetry for at least 2 years.
- In case the telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.
- This data shall also be used for retrieval in case of any dispute between meter data and online data.

3.3 Data Management Software

• The web based Data Management Software must be capable of running on a standard PC compatible with minimum Pentium Processor; in addition, the software must run under Windows XP Professional, Windows Vista, Windows 7 and / or latest version of Windows Operating System and HP Unix, Linux, Solaris, etc.

• The Data Management Software should be cloud base and should have web portal access so that user can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.
• The Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email/SMS to the user.

• The Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.
• The Data Management Software should be able to display all kind of data on screen at any time.
• The Data Management Software should have capability to add additional customer information and create customizable data fields.

3.4 Lab Testing / calibration:

Testing or Calibration of meters shall be performed at ISO 17025: 2017 accredited laboratory. The accuracy of meter shall be within ± 2 % in the operating range. The meter shall have valid model approval certificate.

The meter shall have model approval from India or abroad. Every meter should be calibrated / tested for accuracy in the operating flow range (10% to 100%). At least 4 point calibration at 10%, 40%, 70% and 100% of maximum/rated flow shall be performed.

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with over 9000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 294 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

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With 62 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

Confederation of Indian Industry
The Mantosh Sondhi Centre
23, Institutional Area, Lodi Road, New Delhi – 110 003 (India)
T: 91 11 45771000 / 24629994-7



ANNEXURE-R-7

रजिस्ट्री सं. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

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EXTRAORDINARY

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जल संसाधन, नदी विकास और गंगा संरक्षण विभाग

(केंद्रीय भूमि जल प्राधिकरण)

अधिसूचना

नई दिल्ली, 24 सितम्बर, 2020

का.आ. 3289(अ).—जबकि,1985 की सिविल रिट याचिका 4677, एमसी. मेहता बनाम भारत संघ में पारित दिनांक 10 दिसंबर, 1996 के माननीय उच्चतम न्यायालय के आदेश के माध्यम से इसके दिशा-निर्देशों पर केंद्र सरकार ने भूमि जल प्रबंधन और विकास के विनियमन और नियंत्रण के उद्देश्यों से और कतिपय शक्तियों का प्रयोग करने और उससे संबंधित कतिपय कार्यों को करने के लिए पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 5 के तहत शक्तियों का प्रयोग करने के लिए दिनांक 14 जनवरी, 1997 की अधिसूचना सं.का.आ. 38(अ) के माध्यम से केंद्रीय भूमि जल प्राधिकरण (इसके बाद इसे "प्राधिकरण" के रूप में कहा गया है) गठित किया है।

और जबकि प्राधिकरण उद्योगों, अथवा आधारभूत परियोजनाओं अथवा खनन परियोजनाओं इत्यादि के लिए भूजल निष्कर्षण के लिए "अनापत्ति प्रमाणपत्र" जारी करके भूजल विकास और प्रबंधन को विनियमित करता रहा है और बाइस राज्यों और दो संबंधित संघ शासित क्षेत्रों में, जहां पर भूजल विकास संबंधित राज्य सरकारों तथा संघ शासित प्रशासनों द्वारा विनियमित नहीं किया जा रहा है, समय-समय पर इस संबंध में इसने दिशा-निर्देश तैयार किये थे।

और जबकि, कुछ राज्य सरकारों अथवा, संघ शासित क्षेत्रों ने विधान अधिनियमित किए हैं और भूजल विकास और प्रबंधन को विनियमित करनेकेलिए विनियामक दिशा-निर्देश अथवा आदेश जारी किए हैं।

और जबकि, माननीय राष्ट्रीय हरित अधिकरण, नई दिल्ली ने 2014 की ओ.ए. सं. 204/205/206 में दिनांक 15 अप्रैल 2015 के आदेश के माध्यम से प्राधिकरण को निर्देश जारी किए हैं कि वह सुनिश्चित करें कि ऐसे किसी भी व्यक्ति जो भूजल निष्कर्षण के लिए ट्यूबवेल, अथवा कोई अन्य साधन संचालित कर रहा है, को प्राधिकरण से अनुमति प्राप्त करनी

होगी और वह इसे लागू कानून की शर्त पर संचालित करेगा चाहे ऐसी यूनिट मौजूद यूनिट हो अथवा यूनिट को अभी स्थापित करना हो;

और जबकि, उक्त माननीय अधिकरण ने 2014 की ओ ए सं. 34 और 37 में दिनांक 09 जुलाई 2015 को अपने आदेश के माध्यम से सभी औद्योगिक इकाइयों को, जो सामान्य बहिर्स्राव परिशोधन संयंत्र (सीईटीपीएस) की सदस्य हैं, कानून के अनुसार "अनापत्ति प्रमाणपत्र" प्राप्त करने के लिए राज्य प्रदूषण नियंत्रण बोर्ड के माध्यम से प्राधिकरण से संपर्क करने के निर्देश दिए हैं;

और जबकि, माननीय अधिकरण ने 2014 के ओ.ए सं. 200 में दिनांक 13 जुलाई, 2017 के आदेश के माध्यम से निर्देश दिए कि प्रत्येक उद्योग को ऐसे जल की निकासी के लिए भुगतान करने के निर्देश दिये जाने चाहियें और वह भी, कि यह ऐसी जल निकासी की अनुमति देने के आदेश में बताई गई शर्तों के अनुरूप हो।

और जबकि, उक्त माननीय अधिकरण ने क्रमशः 2015 की ओ.ए. सं. 176 और 2012 की 59 में दिनांक 28 अगस्त 2018 के अपने आदेश में जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय को भूजल संसाधनों के संरक्षण के लिए प्रभावी कदम सुनिश्चित करने के लिए मौजूदा तंत्र की आगे समीक्षा करने के निर्देश दिए;

और जबकि, माननीय राष्ट्रीय हरित अधिकरण के निर्देशों और पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 3 और धारा 5 की उप धारा (3) के तहत प्रदत्त शक्तियों के अनुसरण में प्राधिकरण ने भूजल संसाधनों के बचाव की दृष्टि से 11 अक्टूबर, 2017 को "अनापत्ति प्रमाणपत्र" प्रदान करने के लिए प्रारूप दिशा-निर्देश परिचालित किये जिसमें सभी स्टेकहोल्डरों से टिप्पणियां और सुझाव मांगे गए।

और जबकि, उक्त प्रारूप दिशा-निर्देश के प्रत्युत्तर में प्राप्त सभी आपत्तियों और सुझावों पर केंद्र सरकार द्वारा विधिवत रूप से विचार किया गया है, प्राधिकरण दिनांक 12 दिसंबर, 2018 की अधिसूचना सं.का.आ. 6140 (अ) के माध्यम से देश में भूजल के अति-दोहन को विनियमित करने और भूजल संसाधनों के संरक्षण के दिशा-निर्देश अधिसूचित किए;

और जबकि, उक्त माननीय अधिकरण ने 2015 की ओ ए. सं. 176 में दिनांक 03 जनवरी, 2019 के आदेश के माध्यम से निर्देश दिए थे कि दिनांक 12 दिसंबर, 2018 की उपर्युक्त अधिसूचना को लागू नहीं किया जा सकता,क्योंकि यह स्थाई नहीं है यदि इसकी "पूर्वोपाय सिद्धांत सतत विकास और अंतर-उत्पादन इक्विटी सिद्धांतों" पर जांच की जाती है तो यह स्थाई नहीं है और यदि यह कार्यान्वित की जाती है, तो भूजल में बहुत तेजी से गिरावट आएगी और जल निकाय क्षतिग्रस्त हो जाएंगे और भारत के संबिधान के अनुच्छेद 21 के तहत जीवन के मौलिक अधिकार का हनन होगा;

और जबकि, माननीय अधिकरण ने दिनांक 11 सितंबर, 2019 के आदेश के माध्यम से भूजल की गिरावट को रोकने के लिये, गैर अधिकृत जल निष्कासन के विरूद्ध सख्त मॉनीटरिंग तंत्र और "अनापत्ति प्रमाणपत्र" शर्तों को पूरा करने, पर्यावरण क्षतिपूर्तिइत्यादि पर चर्चा करने के लिए एक समिति गठित की है और इस पर रिपोर्ट प्रस्तुत करने को कहा गया है;

और जबकि, उक्त समिति ने भूजल निष्कर्षण को विनियमित करने और भूजल संरक्षण के प्रारूप दिशा-निर्देशों सहित रिपोर्ट दिनांक 16 मार्च, 2020 को माननीय अधिकरण में प्रस्तुत कर दी है;

और जबकि, उक्त माननीय अधिकरण ने दिनांक 20 जुलाई, 2020 के अपने आदेश के माध्यम से प्राधिकरण द्वारा वाणिज्यिक स्थापनाओं को "अनापत्ति प्रमाणपत्र" जारी करते समय सतत भूजल प्रबंधन के लिए कतिपय बिन्दुओं के साथ अनुकरण करने का निर्देश दिया है।;

अब इसलिए माननीय राष्ट्रीय हरित अधिकरण के दिशा-निर्देशों और पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 की 29) की धारा 5 के साथ पठित धारा 3 की उपधारा (3) द्वारा प्रदत्त शक्तियों के अनुकरण में जल संसाधन, नदी विकास और गंगा संरक्षण विभाग एतद द्वारा नीचे दी गई अधिसूची के अनुसार इस मंत्रालय की अधिसूचना का.आ. 6140 (अ), दिनांक 12 दिसंबर, 2018 का अधिक्रमण करके देश में भूजल निकासी को विनियमित और नियंत्रित करने के दिशा-निर्देश अधिसूचित करता है।

अनुसूची

भारत में भूजल निकासी को विनियमित और नियंत्रित करने के दिशा-निर्देश

(तत्काल प्रभाव से)

इंडेक्स

मद **पृष्ठ सं.**

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[फा. सं. सीजीडब्ल्यूए-21/4/2020- सीजीडब्ल्यूए]

आशीष कुमार, निदेशक

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भारत में भूजल निकासी को विनियमित और नियंत्रित करने के दिशा-निर्देश

प्रस्तावना और पृष्ठभूमि सूचना:

एमसी मेहता बनाम भारत संघ की 1985 की सिविल रिट याचिका सं. 4677 में जारी दिनांक 10 दिसंबर, 1986 के माननीय उच्चतम न्यायालय के आदेश के माध्यम से इसके दिशा-निर्देशों पर केंद्र सरकार ने भूजल प्रबंधन और विकास के विनियमन और नियंत्रण के उद्देश्यों और उक्त अधिनियम के अनुसार कतिपय शक्तियों का प्रयोग करने और कतिपय कार्य करने के लिए पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 5 के तहत शक्तियों का प्रयोग करने के लिए 14 जनवरी, 1997 की अधिसूचना सं.का.आ. 38 (अ) के माध्यम से केंद्रीय भूमि जल बोर्ड को प्राधिकरण के रूप में गठित किया है।

प्राधिकरण उद्योगों अथवा अवसंरचनात्मक परियोजनाओं अथवा खनन परियोजनाओ इत्यादि के लिए भूजल निकासी के लिए 'अनापत्ति प्रमाणपत्र' जारी करके भूजल विकास और प्रबंधन को विनियमित कर रहा है और 22 राज्यों और 2 यू टी में, जहां राज्य सरकार, संबंधितयू टी प्रशासनों द्वारा भूजल विकास विनियमित नहीं किया जा रहा है, लागू इस संबंध मेंसमय समय पर दिशा-निर्देश तैयार किए हैं।

देश में जल के संसाधन के सतत विकास के लिए देश में भूजल निकासी को विनियमित करने और कम भूजल संसाधनों को संरक्षित करने के लिए भूजल निकासी दिशा-निर्देश तैयार किए गए हैं।

ये दिशा-निर्देश राजपत्र अधिसूचना की तारीख से तत्काल प्रभावी होंगे और केंद्रीय भूमि जल प्राधिकरण (सीजीडब्ल्यूए) द्वारा जारी पहले के सभी दिशा-निर्देश के स्थान पर होंगे।

ये दिशा-निर्देश पैन-इंडिया में लागू होंगे। राज्य/संघ राज्य क्षेत्र (जो भूजल निकासी को विनियमित नहीं कर रहे हैं) में भूजल निकासी केंद्रीय भूमि जल प्राधिकरण द्वारा विनियमित की जानी जारी रखी जाएंगी।

इसके अलावा, जिन राज्यों/संघ राज्य क्षेत्रों के अपने भूजल निकासी दिशा-निर्देश हैं, जो सीजीडब्ल्यूए के अनुरूप नहीं है, वहां सीजीडब्ल्यूए के दिशा-निर्देशों के प्रावधान लागू होंगे। तथापि यदि ऐसे राज्यों/संघ राज्य क्षेत्रों द्वारा अनुसरण किए जाने वाले दिशा-निर्देशों में सीजीडब्ल्यूए के दिशा-निर्देशों से अधिक कठोर प्रावधान हैं, तो वहां सीजीडब्ल्यूए के दिशा-निर्देशों में निहित प्रावधानों के अलावा राज्य/संघ राज्य क्षेत्र के प्राधिकरणों द्वारा उन प्रावधानों को भी लागू किया जाएगा। राज्य स्थानीय जल-भूवैज्ञानिक स्थितियों के आधार पर अतिरिक्त शर्तों/मानदंडों का सुझाव देने के लिए स्वतंत्र हो सक्ते हैं, जिसकी स्वीकार करने से पहले सीजीडब्ल्यूए/जल शक्ति मंत्रालय, भारत सरकार द्वारा समीक्षा की जाएगी।

सभी नए/ मौजूद तथा विस्तार माँगने वाले उद्योगों, अवसंरचनात्मक परियोजनाओं और खनन परियोजनाओं को, जब तक कि पैरा 1.0 के अंतर्गत इसे विशिष्ट रूप से छूट प्राप्त न हो, वेब आधारित एप्लीकेशन प्रणाली के माध्यम से अनापत्ति प्रमाण पत्र (एनओसी) प्राप्त करना अपेक्षित होगा।

जल प्रबंधन योजनाएं अतिदोहित यूनिटों के साथ शुरू करके सभी अतिदोहित, गंभीर और अर्ध-गंभीर मूल्यांकन यूनिटों के लिए सभी राज्य भूजल प्राधिकरणों/संगठनों द्वारा तैयार की जाएंगी। जल प्रबंधन योजनाओं की समीक्षा की जाएगी और यह आवधिक रूप से अद्यतन की जाएंगी। इस संबंध में तैयार जल प्रबंधन योजनाएं जल उपलब्धता और कमी के आंकड़े तथा नीति केंद्रीय भूमि जल प्राधिकरण/राज्य भूमि जल प्राधिकरण की वेबसाइटों पर दर्शाई जाएगी।

1.0 एनओसी प्राप्त करने से छूट:

उपभोक्ताओं की निम्नलिखित श्रेणियों को भूजल निकासी के लिए एनओसी प्राप्त करने से छूट दी जाएगी:

(i) पेयजल और घरेलू उपयोग के लिए ग्रामीण और शहरी दोनोंक्षेत्रों में वैयक्तिक घरेलू उपभोक्ता।

(ii) ग्रामीण पेयजल आपूर्ति स्कीमें।

(iii) ग्रामीण और शहरी दोनों क्षेत्रों में सशस्त्र बलों के प्रतिष्ठान और केन्द्रीय सशस्त्र पुलिस बल।

(iv) कृषि कार्यकलाप।

(v) 10 सी यू एम / दिन से कम भूजल का आहरण करने वाले माइक्रो और स्माल उद्योग।

1 . 1 ड्रिलिंग रिगों का पंजीकरण

राज्य/संघ राज्य सरकारें अपने क्षेत्राधिकार में संचालित ड्रिलिंग रिगों के पंजीकरण और उनके द्वारा ड्रिल किए गए कुओं के डेटाबेस के रख-रखाव के लिए जिम्मेदार होंगी। सीजीडब्ल्यूए को आंकड़े उपलब्ध कराने के लिए सीजीडब्ल्यूए पोर्टल में उपयुक्त लिंक दिए जाएंगे।

2.0 शहरी क्षेत्रों में रेजीडेंसियल अपार्टमेंट/ग्रुप हाउसिंग सोसाइटी/सरकारी जलापूर्ति एजेंसियों के लिए पेय और घरेलू प्रयोग के लिए जल

भूजल निकासी के लिए अनापत्ति प्रमाण पत्र (एनओसी) देने के लिए परियोजना प्रस्तावक को सीजीडब्ल्यूए वेबसाइट में उपलब्ध उपयुक्त फॉर्मेट में सीजीडब्ल्यूए द्वारा जारी दिशा-निर्देशों के अनुसार ब्यौरा भेजना होता है। नए/मौजूदा कुओं के लिए एनओसी केवल ऐसे मामलों में ही दिया जाता है, जहां स्थानीय सरकारी जलापूर्ति एजेंसी उस क्षेत्र में अपेक्षित मात्रा में जल की आपूर्ति करने में सक्षम नहीं है।

एनओसी तभी दिया जाएगा बशर्ते कि निम्नलिखित विशिष्ट शर्ते पूरी हों:

i) सीवेज परिशोधन संयंत्रों का संस्थापन सभी रेजीडेंशियल अपार्टमेंट/ग्रुप हाउसिंग सोसाइटी के लिए अनिवार्य होगा जहां भूजल, की आवश्यकता 20 घनमीटर/दिन से अधिक है। एसटीपी का जल शौचालय फ्लशिंग, कार धोने, बागवानी इत्यादि के लिए उपयोग किया जाएगा।

ii) यह एनओसी जारी होने की तारीख से 5 वर्षों की अवधि अथवा परियोजना क्षेत्र के लिए स्थानीय सरकार द्वाराजलापूर्ति करने के समय तक, जो भी पहले हो, वैध होगा। यदि परियोजना प्रस्तावक एनओसी की वैधता के दौरान संबंधित स्थानीय सरकार से जलापूर्ति प्राप्त करता है, तो परियोजना प्रस्तावक को सीजीडब्ल्यूए को जलापूर्ति की उपलब्धता के संबंध में सूचित करना होगा और प्राधिकरण द्वारा एनओसी रद्द कर दिया जाएगा। अन्य मामलों में परियोजना प्रस्तावक एनओसी की समाप्ति के 90 दिनों से पहले एनओसी के नवीकरण के लिए आवेदन करेगा।

iii) प्रस्तावक को तालिका 6.1 में उल्लिखित दरों के अनुसार जल निकासी के प्रस्तावित भूजल के लिए भूजल निकासी प्रभार का भुगतान करना होगा।

आवेदन के साथ प्रस्तुत किए जाने वाले दस्तावेज

क) फ्लाशिंग इत्यादि के लिए पुनः चक्रित/परिशोधित जल के पुनः प्रयोग को ध्यान में रखते हुए राष्ट्रीय भवन कोड, 2016 (अनुलग्नक-I) के अनुसार अपेक्षित जल के ब्यौरे।

ख) आवेदक द्वारा 10/- रु. के गैर-न्यायिक स्टैंप पर हलफनामा जिसमें पेय/घरेलू उपयोग के लिए 10 घनमीटर/दिन तक उपभोक्ता की भूजल की आवश्यकता होने की स्थिति में लोक जलापूर्ति की गैर/अपर्याप्त उपलब्धता कीपुष्टि की जाये।

ग) पेय/घरेलू उपयोग के लिए 10 घनमीटर/दिन से अधिक भूजल आवश्यकता के मामलों में स्थानीय सरकारी जलापूर्ति एजेंसियों को एनओसी के लिए आवेदन करते समय कार्यान्वित की जाने वाली स्कीम/प्रस्तावित परियोजना के लिए सरकारी अनुमोदन की प्रति प्रस्तुत करनी होगी।

घ) किसी भी नेशनल अक्रेडिशन बोर्ड फौर टेस्टिंग एंड कैलिब्रेशन लैबोरेटरी (एनएबीएल) से प्रत्यायित प्रयोगशाला अथवा सरकार से अनुमोदित प्रयोगशाला से (एनओसी के लिए आवेदन कर रही मौजूदा परियोजनाओं के मामले में) मौजदा बोरवेल/ट्यूबबेल के भूजल गुणवत्ता आंकड़े।

ड.) आवास और शहरी कार्य मंत्रालय द्वारा जारी मॉडल भवन उपनियमों के अनुसार क्षेत्र के भीतर वर्ष जल संचयन/पुनर्भरण के लिए प्रस्ताव।

3.0 कृषि क्षेत्र

कृषि क्षेत्र भारतीय अर्थव्यवस्था की रीढ़ की हड्डी है। वर्ष 2013-14 की लघु सिंचाई गणना के अनुसार 87.86 प्रतिशत कुएं 4 हेक्टेयर तक की भूमि वाले सीमान्त, लघु और अर्ध-मध्यम किसानों के हैं। लगभग 9.18 प्रतिशत कुएं 4-10 हेक्टेयर की भूमि वाले मध्यम किसानों के हैं और 2.96 प्रतिशत कुएं 10 हेक्टेयर से अधिक भूमि वाले किसानों के हैं।

भूजल निकासी संरचनाओं की संख्या पर विचार करते हुए 'कमांड एंड कंट्रोल' नीति के माध्यम से कृषि क्षेत्र में भूजल का विनियमन करना कठिन कार्य होगा। इसलिए सतत भूजल प्रबंधन के लिए भागीदारी दृष्टिकोण अधिक सार्थक होगा।

राज्यों/संघ राज्य क्षेत्रों को किसानों के लिए मुफ्त/रियायती विद्युत नीति की समीक्षा करने, उपयुक्त विद्युत मूल्य नीति तैयार करने और भूजल पर अत्यधिक निर्भरता को कम करने के लिए फसलों की अदला-बदली/विविधीकरण/अन्य पहलों के प्रति कार्य करने की सलाह दी जाती है।

कृषि क्षेत्र को भूजल निकासी के लिए एनओसी प्राप्त करने से छूट दी जाएगी।

4.0 वाणिज्यिक प्रयोग

नीति दिशा-निर्देशों के अनुरूप के अतिरिक्त अतिदोहित मूल्यांकन क्षेत्रों में किसी भी नये वृहद उद्योग को एनओसी नहीं दिया जाएगा।

वाणिज्यिक प्रयोग के लिए एनओसी देने हेतु आवेदन पर विचार करते समय भूजल संसाधनों की उपलब्धता पर पर्याप्त ध्यान दिया जाएगा।

भूजल निकालने वाले वाणिज्यिक उद्यमों को संदर्भित धाराओं में उल्लिखित जल प्रयोग के लेखा सहित वार्षिक जल लेखा परीक्षा रिपोर्ट ऑनलाइन प्रस्तुत करनी होगी। सीजीडब्ल्यूए/राज्य भूजल प्राधिकरण (एसजीडब्ल्यूए) सभी ऐसी लेखा परीक्षा रिपोर्ट ऑनलाइन प्रकाशित करेगा।

सीजीडब्ल्यूए/एसजीडब्ल्यूए आवधिक रूप से एनओसी के अनुपालन की जांच करने के लिए स्वायत्त एजेंसियों को कार्य पर लगाएगा।

4.1 औद्योगिक प्रयोग

अतिदोहित मूल्यांकन इकाइयों में सूक्ष्म, लघु और मध्यम उद्यमों (एमएसएमई) की श्रेणी में आने वालों के अलावा किसी भी नए उद्योग को भूजल निकासी के लिए एनओसी नहीं दिया जाएगा। तथापि कार्यबल के लिए पेयजल/घरेलू प्रयोग, इन नए उद्योगों द्वारा ग्रीनबेल्ट उपयोग के लिए अनओसी की अनुमति होगी। अतिदोहित क्षेत्रों में नए सीलबंद जल उद्योगों को, चाहे वे एमएसएमई श्रेणी में आते हों, एनओसी नहीं दिया जाएगा।

उद्योगों द्वारा भूजल निकासी के लिए एनओसी दिया जाएगा बशर्ते कि निम्नलिखित शर्ते पूरी हों:-

I. ऐसे मामलों में ही एनओसी प्रदान किया जाएगा, जहां स्थानीय सरकारी जलापूर्ति एजेंसियां जल की अपेक्षित मात्रा की आपूर्ति करने में सक्षम नहीं है।

II. सभी उद्योगों को अद्यतन जल दक्ष प्रौद्योगिकी को अपनाना अपेक्षित होगा, ताकि भूजल संसाधन पर निर्भरता कम की जा सके।

III. 100 घनमीटर/दिन से अधिक भूजल की निकासी वाले सभी उद्योगों को कंफेडरेशन ऑफ इंडियन इंडस्ट्रीज (सीआईआई)/फेडरेशन इंडियन चेम्बर ऑफ कॉमर्स एंड इंडस्ट्रीज (एफआईसीसीआई)/नेशनल प्रोडक्टिविटी काउंसिल (एनपीसी) कोप्रमाणित लेखा परीक्षकों के माध्यम से वार्षिक जल लेखा परीक्षा करवाना और इसके पूरे होने के तीन माह के भीतर लेखा परीक्षा रिपोर्ट सीजीडब्ल्यूए को प्रस्तुत करना अपेक्षित होगा। ऐसे सभी उद्योगों को उपयुक्त साधनों के माध्यम से अगले तीन वर्षों तकअपने भूजल प्रयोग को कम से कम 20 प्रतिशत कम करना अपेक्षित होगा।

IV. अपने क्षेत्र के भीतर पर्यवेक्षण कुएं, पीजोमीटर का निर्माण और धारा 15 में यथा उल्लिखित उपयुक्त जल स्तर मॉनीटरिंग तंत्र की संस्थापना करना 10 घनमीटर/दिन से अधिक की भूजल निकासी करने का प्रस्ताव करने वाले उद्योगों के लिए अनिवार्य होगा। जल स्तर की मॉनीटरिंग परियोजना प्रस्तावक द्वारा की जाएगी। बोरवेल/प्रोडक्शन वेल से कम से कम 15 मीटर की दूरी पर पीजोमीटर (अन्वेषण कुएं) का निर्माण किया जाएगा। पीजोमीटर में गहराई और चिह्नित जलभृत क्षेत्र पम्पिंग कुएं/कुओं के समान ही होंगे। पीजोमीटर के डिजाइन और निर्माण के विस्तृत दिशा-निर्देश अनुलग्नक-II में दिए गए हैं। मासिक जल स्तर आंकड़े वेब पोर्टल के माध्यम से सीजीडब्ल्यूए को प्रस्तुत किए जाएंगे।

V. प्रस्तावक को परियोजना क्षेत्र में छतका वर्षाजल संचयन/पुर्नभरण करना अपेक्षित है। भूजल को प्रदूषित करने की संभावना वाले उद्योगों(रसायन, फार्मास्यूटिकल, डाई, पिगमेंट, पेंट, वस्त्र,टैनिंग,पेस्टिसाइड/कीटनाशक, उर्वरक, स्लॉटर हाउस, विस्फोटक इत्यादि) को उद्योग में प्रयोग करने के लिए सतह संग्रह टेंकों में वर्षाजल संचय करना होगा।

VI. जलभृत सिस्टम में शोधित/गैर शोधित अपशिष्ट जल डालने की सख्त मनाही है।

VII. भूजल प्रदूषण के सम्भावित कारक उद्योगों जैसे टैनिंग, स्लॉटर हाउस, डाई, रसायन/पेट्रोकेमिकल, कोयला वॉशरीज, अन्य खतरनाक इकाइयों आदि को (सी पी सी बी लिस्ट के अनुसार) भूजल प्रदूषण के निवारणको सुनिश्चित करने के लिये आवश्यक वेल हेड संरक्षण उपायों को करने की आवश्यकता हैं (अनुलग्नक-III)।

VIII. सुरक्षित, अर्ध गंभीर और गंभीर आकलन यूनिटों में भूजल की निकासी करने वाले सभी उद्योगों को तालिका 5.2 क और 5.3 क के अनुसार लागू भूजल निकासी प्रभार का भुगतान करना अपेक्षित होगा।

IX. अतिदोहित आकलन यूनिटों में भूजल निकासी करने वाले सभी मौजूदा उद्योगों को तालिका 5.2 ख और 5.3 ख के अनुसार लागू भूजल निकासी प्रभारों का भुगतान करना होगा।

आवेदन के साथ प्रस्तुत किए जाने वाले दस्तावेज

(क) ऐसे मामलों में, जहां भूजल 10 घनमीटर/दिन तक अपेक्षित है, स्थानीय सरकारी एजेंसियों से जलापूर्ति उपलब्ध न होने के संबंध में 10/- रु. के गैर न्यायिक स्टैंप पेपर पर एक हलफनामा।

(ख) ऐसे मामलों में, जहां भूजल 10 घनमीटर/दिन से अधिक अपेक्षित है, स्थानीय सरकारी जलापूर्ति एजेंसियों से ताजे जल/शोधित अपशिष्ट जल की आपूर्ति की उपलब्धता न होने/आंशिक रूप से होने का प्रमाणपत्र।

(ग) किसी भी एनएबएल प्रत्यायित प्रयोगशाला अथवा सरकार से अनुमोदन प्राप्त प्रयोगशाला (एनओसी के लिए आवेदन कर रही मौजूदा परियोजनाओं के मामले में) से मौजूदा बोरवेल/ट्यूबवेल/डगवेल के भूजल गुणवत्ता आंकड़े।

(घ) एनएबीएल प्रत्यायित प्रयोगशाला/सरकार से अनुमोदन प्राप्त प्रयोगशालाओं से मौजूदा उद्योगों के संबंध में बोरवेल/ट्यूबवेल/डगवेल के जल गुणवत्ता आंकड़े।

(ङ) आवासन और शहरी कार्य मंत्रालय द्वारा जारी मॉडल भवन उप-विधिवों के अनुसार क्षेत्र के भीतर वर्षा जल संचयन/पुनर्भरण के लिए प्रस्ताव।

(च) **प्रभाव आकलन रिपोर्टः** अतिदोहित, गंभीर और अर्ध गंभीर क्षेत्रों में 100 घनमीटर/दिन से अधिक भूजल निकालने वाली/प्रस्तावित सभी परियोजनाओं के लिए भूजल रिजीम पर मौजूदा/प्रस्तावित भूजल निकासी की प्रभाव आकलन रिपोर्ट और प्रत्यायित सलाहकारों द्वारा तैयार सामाजिक-आर्थिक प्रभाव रिपोर्ट भी प्रस्तुत करना अनिवार्य होगा। इस रिपोर्ट का प्रोफार्मा अनुलग्नक-IV में दिया गया है।

4.2 खनन परियोजनाएं-

सभी मौजूदा और नई खनन परियोनजाओं को भूजल निकासी के लिए एनओसी प्राप्त करना अपेक्षित होगा। चूंकि खनन परियोजनाएं स्थान विशिष्ट होती हैं, इसलिए अतिदोहित आकलन यूनिटों में ऐसी परियोजनाओं के लिए भूजल निकासी हेतु एनओसी देने पर कोई रोक नहीं होगी।

खनन परियोजनाओं के लिए एनओसी प्रदान किया जाएगा, बशर्ते कि निम्नलिखित विशिष्ट शर्तें पूरी हों:

i) सभी खनन उद्योगों के लिए यह सुनिश्चित करना अनिवार्य होगा कि डी-वाटरिंग कार्यों से उपलब्ध जल उपयुक्त रूप से शोधित है और इसे सिंचाई, डस्ट सप्रेशन, खनन प्रक्रिया, अनुप्रवाह में पुनर्भरण और नदी सिस्टम में ई-फ्लो के रख-रखाव के लिए लाभप्रद रूप से उपयोग किया जाना चाहिए।

ii) मासिक भूजल स्तर मॉनीटरिंग के लिए क्षेत्र में परिधि के साथ अन्वेषण कुएं (पीजोमीटर) का निर्माण, भूजल की 10 घनमीटर/दिन से अधिक की निकासीकरने वाली/इसका प्रस्ताव करने वाली खानों के लिए अनिवार्य होगा। गहराई और पीजोमीटर में चिह्नित जलभृत क्षेत्र पम्पिंग कुएं/कुओं के अनुरूप होगा।

iii) इसके अतिरिक्त, प्रस्तावक एनओसी में बताए गए मुख्य और प्रतिरोधक क्षेत्रों में अन्वेषण कुओं (पीजोमीटर) की स्थापना करके भूजल स्तरों को मॉनीटरिंग करेगा।

iv) कोयला और अन्य मूल धातु खनन के मामले में परियोजना प्रस्तावक सतही जल के संदूषण से बचाव के लिए उच्च स्तर की डिवाटरिंग प्रौद्योगिकी (डिवाटरिंग अवरोधक संरचनाओं की श्रृंखला का निर्माण करके) का प्रयोग करेगा।

v) इसके अलावा सभी खनन यूनिटें एनएबीएल प्रत्यायित/सरकार से अनुमोदन प्राप्त प्रयोगशालाओं के माध्यम से खान रिसाव और खानडिस्चार्जकी जल गुणवत्ता को भी मॉनीटर करेंगी और स्वयं अनुपालान के समय इसे प्रस्तुत किया जायेगा।

vi) सुरक्षित, अर्ध गंभीर और गंभीर आकलन यूनिटों में भूजल की निकासी करने वाली सभी खनन परियोजनाएं तालिका 5.4 क के अनुसार लागू भूजल निकासी प्रभारों का भुगतान करेंगी।

vii) अतिदोहित आकलन यूनिटों में भूजल की निकासी करने वाली सभी खनन परियोजनाओं को तालिका 5.4 ख के अनुसार भूजल संग्रहण प्रभार का भुगतान करना होगा।

आवेदन के साथ प्रस्तुत किए जाने वाले दस्तावेज

(क) संबंधित सरकारी एजेंसी/विभाग द्वारा अनुमोदित खनन योजना।

(ख) आवासन और शहरी कार्य मंत्रालय द्वारा जारी मॉडल भवन उप नियमों के अनुसार क्षेत्र के भीतर वर्षा जल संचयन/पुनर्भरण के लिए प्रस्ताव।

(ग) खनन के मूल और प्रतिरोधक क्षेत्रों दोनो में भूजल स्थिति का गहराई वार और वर्षवार खनन रिसाव गणना, खनन और डिवाटरिंग काभूजल क्षेत्र में आकलन प्रभाव और इसका सामाजिक-आर्थिक प्रभाव, पुनर्चक्रण, पुनः प्रयोग और पुनर्भरण का ब्यौरा, स्थानीय परिस्थितियों के आधार पर भूजल पर प्रतिकूल प्रभाव को न्यूनतम और समाप्त करने के लिए खनन और जल प्रबंधन के लिए प्रौद्योगिकी का प्रयोग करके पम्पिंग को कम करने के संबन्ध में प्रत्यायित सलाहकार द्वारा तैयार की गई व्यापक रिपोर्ट। रिपोर्ट का फॉर्मेट अनुलग्नक V में दिया गया है।

4.3 आधारभूत परियोजनाएं

चूंकि आधारभूत परियोजनाएं स्थान विशिष्ट होती हैं, अतिदोहित आकलन यूनिटों में स्थित ऐसी परियोजनाओं को एनओसी देने पर कोई रोक नहीं होगी। नई आधारभूत परियोजनाओं/आवासीय भवनों को निर्माण कार्यकलाप के दौरान डिवाटरिंग और / अथवा निर्माण के लिए भूजल का उपयोग अपेक्षित होगा। दोनों ही मामलों में आवेदक कार्य आरम्भ होने से पहले

सीजीडब्ल्यूए से एनओसी प्राप्त करेगा। तथापि अतिदोहित आकलन यूनिटों में निर्माण कार्यकलापों के लिए भूजल का प्रयोग तभी अनुमत्य होगा। यदि उस स्थान के 10 किलोमीटर की परिधि के भीतर कोई भी शोधित सीवेज जल उपलब्ध न हो। नई और मौजूदा आधारभूत परियोजनाओं को भूजल निकासी के लिए एनओसी प्राप्त करना भी अपेक्षित होगा।

अतिदोहित आकलन यूनिटों में वाटर पार्क, थीम पार्क, और मनोरंजन पार्कों के लिए भूजल की निकासी हेतु एनओसी नहीं दिया जाएगा।

आधारभूत परियोजनाओं की सांकेतिक सूची अनुलग्नक VI में दी गई है।

भूजल की निकासी के लिए एनओसी दिया जाएगा बशर्ते कि निम्नलिखित विशिष्ट शर्तें पूरी हों:

i) आधारभूत परियोजनाएं, जिनके लिए डिवाटरिंग अपेक्षित हैं, के मामले में प्रस्तावक को डिवाटरिंग बहिर्स्राव दर (डिजीटल वाटर फ्लो मीटर का प्रयोग करके) की नियमित मॉनीटरिंग करनी और सीजीडब्ल्यूए/ एसजीडब्ल्यूए जो भी लागू हो, के वेब पोर्टल के माध्यम से आंकड़े प्रस्तुत करना आवश्यक होगा। मॉनीटरिंग रिकॉर्डों और परिणामों को सीजीडब्ल्यूए/ एसजीडब्ल्यूए की अपेक्षानुसार निरीक्षण अथवा रिपोर्टिंग के लिए प्रस्तावक द्वारा दो वर्ष तक रखना अपेक्षित होगा।

ii) ऐसी नई परियोजनाओं के लिए, जहां 20 घनमीटर/दिन से अधिक भूजल की आवश्यकता है, सीवेज परिशोधन संयंत्रों (एसटीपी) की संस्थापना अनिवार्य होगी। एसटीपी का जल शौचालय फ्लशिंग, कार धोने, बागवानी करने इत्यादि के लिए प्रयोग किया जाएगा।

iii) आधारभूत डिवाटरिंग/निर्माण कार्यकलापों के लिए परियोजना प्रस्तावक द्वारा प्रस्तुत विस्तृत प्रस्ताव के अनुसार विशिष्ट अवधि के लिए एनओसी वैध होगा।

iv) सुरक्षित, अर्ध गंभीर और गंभीर आकलन यूनिटों में भूजल निकासी की सभी आधारभूत परियोजनाओं को तालिका 5.3 क के अनुसार लागू भूजल निकासी प्रभार देना अपेक्षित होगा।

v) अति-दोहित आकलन यूनिटों में भूजल निकालने वाली सभी आधारभूत परियोजनाओं (नई/मौजूदा) को तालिका 5.3 ख के अनुसार भूजल संग्रहण प्रभार का भुगतान करना होगा।

आवेदन के साथ प्रस्तुत किए जाने वाले दस्तावेज

(*क*) ऐसे मामले, जहां डिवाटरिंग होती है, में पम्पिंग की विस्तृत योजना बताते हुए क्षेत्र में भूजल की स्थिति, पंप किए गए जल का प्रस्तावित प्रयोग और उसका भूजल रिजीम पर व्यापक प्रभाव आकलन के सम्बंध में प्रत्यायित सलाहकार द्वारा तैयार की गई प्रभाव आकलन रिपोर्ट प्रस्तुत करना अनिवार्य होगा। रिपोर्ट में भूजल स्तर की गिरावट, भूमि धंसान इत्यादि जैसे किन्ही विशिष्ट पर्यावरणीय मुद्दों से जूझने के लिए पर्यावरणीय जोखिम और प्रस्तावित प्रबंधन नीतियों को दर्शाया जाना चाहिए।

(*ख*) सुरक्षित और अर्ध गंभीर क्षेत्रों में निर्माण के लिए जल की अपेक्षा होने की स्थिति में किसी अन्य स्रोत से जल उपलब्ध न होने के संबंध में 10/-रु. के गैर-न्यायिक स्टैंप पेपर पर एक हलफनामा।

(*ग*) गंभीर और अतिदोहित क्षेत्रों में स्थल की 10 कि.मी. की परिधि के भीतर निर्माण के लिए परिशोधित सीवेज जल के उपलब्ध न होने के संबंध में सरकारी एजेंसी से प्रमाणपत्र।

(*घ*) वाणिज्यिक प्रयोग के लिए आकलन यूनिटों की सभी श्रेणियों के संबंध में स्थानीय सरकारी जलापूर्ति एजेंसी से जल के उपलब्ध न होने के संबंध में प्रमाण पत्र।

(*ङ*) आवासन और शहरी कार्य मंत्रालय द्वारा जारी मॉडल भवन उप-नियमों के अनुसार क्षेत्र के भीतर वर्षाजल संचयन/पुनर्भरण के लिए प्रस्ताव।

(*च*) फ्लशिंग इत्यादि के लिए परिचक्रण/परिशोधित जल के पुनः उपयोग (वाणिज्यिक प्रयोग के लिए पूरी हो चुकी आधारभूत परियोजनाओं के मामले में) को ध्यान में रखते हुए राष्ट्रीय भवन कोड, 2016 (अनुलग्नक-I) के अनुसार संगणित जल आवश्यकता का ब्यौरा।

(*छ*) वाणिज्यिक प्रयोग के लिए जल की आवश्यकता वाली आधारभूत परियोजनाओं के लिए संबंधित एजेंसी से पूरा होने का प्रमाणपत्र।

5.0 भूजल निकासी/संग्रहित प्रभार

शहरी क्षेत्रों में सभी रेजीडेंशियल अपार्टमेंट/ग्रुप हाउसिंग सोसाइटी/सरकारी जलापूर्ति एजेंसियों को भूजल निकासी के लिए भुगतान करना अपेक्षित होगा।

सुरक्षित, अर्ध गंभीर और गंभीर आकलन यूनिटों में भूजल की निकासी करने वाले सभी उद्योगों/खनन/आधारभूत परियोजनाओं को भूजल निकासी की मात्रा और इस दिशा-निर्देश में दिए गए ब्यौरों के अनुसार आकलन यूनिट की श्रेणी के आधार पर भूजल निकासी प्रभार का भुगतान करना होगा।

अतिदोहित आकलन यूनिटों में भूजल की निकासी करने वाले एमएसएमई सहित सभी मौजूदा खनन/आधारभूत परियोजनाओं और मौजूदा उद्योगों को भूजल निकासी की मात्रा के आधार पर भूजल संग्रहण प्रभार देने होंगे। इसके अतिरिक्त, अतिदोहित क्षेत्रों में नए एमएसएमई, नई अवसंरचना और नई खनन परियोजनाओं को भी भूजल संग्रहण प्रभार का भुगतान करना अपेक्षित होगा।

एनओसी देते समय अथवा उसके नवीकरण के समय मौजूद भूजल दिशा-निर्देशों में निर्धारित शर्तों के अनुकरण में जिन मौजूदा उद्योगों, आधारभूत यूनिटों और खनन परियोनजाओं ने कृत्रिम पुनर्भरण संरचनाएं संस्थापित/निर्मित की हैं, को भूजल निकासी प्रभार/ भूजल संग्रहण प्रभार में 50 प्रतिशत की छूट मिलेगी, बशर्ते कि उनका कार्य निष्पादन और जांच संतोषजनक हो।

प्रस्तावित जल निकासी/संग्रहण प्रभार से सृजित राजस्व स्थल विशिष्ट उपयुक्त मांग/आपूर्ति पक्ष के कार्यों के कार्यान्वयन हेतु अलग निधि में रखा जाएगा।

5.1 भूजल निकासी/संग्रहण प्रभार की दरें

I. **शहरी क्षेत्रों में रेजीडेंसियल अपार्टमेंट/ग्रुप हाउसिंग सोसाइटी/सरकार जलापूर्ति एजेंसियों के लिए पेय और घरेलू प्रयोग।**

केवल पेय/घरेलू प्रयोग के लिए जल की आवश्यकता वाले सभी रेजीडेंशियल अपार्टमेंट/ग्रुप हाउसिंग सोसाइटी को एनओसी लेने के लिए तालिका 5.1 में दी गई दरों के अनुसार भूजल निकासी प्रभार देना होगा।

तालिका 5.1 में पेय और घरेलू प्रयोग के लिए भूजल निकासी प्रभार

निकाले गए भूजलकी मात्रा (घनमीटर/माह)	भूजल निकासी प्रभार की दर (रु. प्रति घनमीटर)
0-25	कोई प्रभार नहीं
26-50	1.00
>50	2.00

सरकारी जलापूर्ति एजेंसियों और सरकारी आधारभूत परियोजनाओं को 0.50 रु. प्रति घनमीटर की दर से भूजल निकासी प्रभार का भुगतान करना होगा।

II. **सीलबंद पेयजल यूनिटें**

सुरक्षित, अर्ध गंभीर और गंभीर आकलन यूनिटों में सीलबंद पेयजल यूनिटों के लिए भूजल निकासी प्रभारों की दर तालिका 5.2 क में दी गई है और अति दोहित आकलन यूनिटों में भूजल संग्रहण प्रभार तालिका 5.2 ख दिए गए हैं।

तालिका 5.2 कः सीलबंद पेयजल यूनिटों के लिए भूजल निकासी प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी ↓ / भूमिजल प्रयोग →	निकाले गए भूजल की मात्रा				
		50 घनमीटर/ दिन तक	51से<200 घनमीटर/दिन	200 से<1000 घनमीटर/दिन	1000 से <5000 घनमीटर/दिन	5000 घनमीटर/ दिन और अधिक
1.	सुरक्षित	1.00	3.00	5.00	8.00	10.00
2.	अर्ध-गंभीर	2.00	5.00	10.00	15.00	20.00
3.	गंभीर	4.00	10.00	20.00	40.00	60.00

तालिका 5.2 ख सीलबंद पेयजल यूनिटों के लिए भूजल रेस्टॉरेशन प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी ↓ / भूमिजल → प्रयोग	निकाले गए भूजल की मात्रा				
		50 घनमीटर/ दिन तक	51 से<200 घनमीटर/ दिन	200 से<1000 घनमीटर/दिन	1000 से <5000 घनमीटर/दिन	5000 घनमीटर/ दिन और उससे अधिक
1.	अतिदोहित (केवल मौजूदा उद्योग)	8.00	20.00	40.00	80.00	120.00

III. **अन्य उद्योग और आधारभूत परियोजनाएं**

सुरक्षित, अर्ध-गंभीर और गंभीर आकलन यूनिटों में अन्य उद्योगों और आधारभूत परियोजनाओं के लिए भूमिजल निकासी प्रभार की दरें तालिका 5.3 क में दी गई हैं और अतिदोहित आकलन यूनिटों में भूजल संग्रहण प्रभार तालिका 5.3 ख में दिए गए हैं।

तालिका 5.3 कः अन्य उद्योगों और आधारभूत परियोजनाओं के लिए भूजल निकासी प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी ↓ / भूमिजल → प्रयोग	निकाले गए भूजल की मात्रा			
		< 200 घनमीटर/ दिन	200 से<1000 घनमीटर/दिन	1000 से <5000 घनमीटर/ दिन	5000 घनमीटर/दिन और उससे अधिक
1.	सुरक्षित	1.00	2.00	3.00	5.00
2.	अर्ध-गंभीर	2.00	3.00	5.00	8.00
3.	गंभीर	4.00	6.00	8.00	10.00

तालिका 5.3 खः अन्य उद्योगों और आधारभूत परियोजनाओं के लिए भूजल निकासी प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी ↓ / भूमिजल प्रयोग →	निकाले गए भूजल की मात्रा			
		< 200 घनमीटर/दिन	200 से<1000 घनमीटर/दिन	1000 से <5000 घनमीटर/दिन	5000 घनमीटर/दिनऔर उससे अधिक
1.	अतिदोहित (वर्तमान दिशा-निर्देशों के अनुसार मौजूद उद्योग/नए उद्योग)	6.00	10.00	16.00	20.00

IV. **खनन परियोजनाएं**

सुरक्षित, अर्ध-गंभीर और गंभीर आकलन यूनिटों में भूजल निकालने वाले खनन के लिए भूजल निकासी प्रभार की दरें तालिका *5.*4 क में दी गई हैं और अतिदोहित आकलन यूनिटों में भूजल निकालने वाली परियोजनाओं के मामले में भूजल संग्रहण प्रभार तालिका 5.4 ख में दियाँ गया हैं।

तालिका 5.4 कः खनन के लिए भूजल निकासी प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी ↓ / भूमिजल प्रयोग →	निकाले गए भूजल की मात्रा			
		< 200 *घनमीटर/दिन*	200 से<1000 *घनमीटर/दिन*	1000 से <5000 *घनमीटर/दिन*	5000 *घनमीटर/दिन* और उससे अधिक
1.	सुरक्षित	1.00	2.00	2.50	3.00
2.	अर्ध-गंभीर	2.00	2.50	3.00	4.00
3.	गंभीर	3.00	4.00	5.00	6.00

तालिका 5.4 ख खनन के लिए भूजल निकासी प्रभार की दरें (रु. प्रति घनमीटर)

क्र.सं.	क्षेत्र की श्रेणी → ↓ / भूमिजल प्रयोग	निकाले गए भूजल की मात्रा			
		< 200 *घनमीटर/दिन*	200से<1000 *घनमीटर/दिन*	1000 से <5000 *घनमीटर/दिन*	5000 *घनमीटर/दिन* और उससे अधिक
1.	अति-दोहित	4.00	5.00	6.00	7.00

6.0 प्रचुर जलापूर्ति

भूजल निकालने और उसकी आपूर्ति करने वाले सभी निजी टैंकर, जो प्रचुर जलापूर्ति करते हैं, को भूजल निकासी के लिए एनओसी प्राप्त करना अब जरूरी होगा। सुरक्षित, अर्ध-गंभीर और गंभीर आकलन इकाइयों में भूजल निकालकर टैंकरों के

माध्यम से प्रचुर जलापूर्ति करने वाले आपूर्तिकर्ता को तालिका 6.1 के अनुसार भूजल निकासी प्रभार का भुगतान करना होगा। अति-दोहित आकलन इकाइयों में भूजल निकालने वाले प्रचुर मात्रा में जलापूर्तिकर्ताओं को तालिका 6.1 ख के अनुसार भूजल संग्रहण प्रभार का भुगतान करना होगा। सभी टैंकरों में उनकी मूवमेंट/कार्य क्षेत्र की मॉनिटरिंग के लिए जीपीएस आधारित सिस्टम संस्थापित करना होगा।

प्रचुर/टैंकर जलापूर्ति के लिए एनओसी जारी करने की कार्य प्रणाली राज्यों/संघ राज्य क्षेत्रों के साथ परामर्श करके तैयार की जायेगी और इस संबंध में उपयुक्त दिशा-निर्देश तैयार किए जाएंगे और उनके लिए अलग से जारी किए जाएंगे।

तालिका 6.1 क प्रचुर/ टैंकर जलापूर्ति के लिए भूजल निकासी प्रभार	
श्रेणी	प्रति घनमीटर की दर (रु. में)
सुरक्षित	**10**
अर्ध-गंभीर	**20**
गंभीर	**25**

तालिका 6.1 ख प्रचुर/ टैंकर जलापूर्ति के लिए भूजल निकासी प्रभार	
श्रेणी	प्रति घनमीटर की दर (रु. में)
अतिदोहित	**35**

7.0 लवणीय भूजल की निकासी

अति-दोहित क्षेत्रों में स्थित आधारभूत / खनन परियोजनाओं द्वारा उद्योगों/डिवाटरिंग द्वारा प्रयोग के लिए ताजे जल की अपेक्षा सभी गहराइयों पर लवणीय भूजल अथवा अन्यथा लवणीय ताजे जल क्षेत्र में लवणीय भूजल की पॉकेटों से युक्त क्षेत्रों में लवणीय भूजल की निकासी को प्रोत्साहित किया जाएगा।ऐसे उद्योगों को भूजल निकासी प्रभार का भुगतान करने से छूट दी जाएगी।

डायनामिक भूजल संसाधन के अद्यतन मूल्यांकन के अनुसार सभी गहराइयों पर लवणीय भूजल वाली ऐसी आकलन इकाइयों की सूची सीजीडब्ल्यूए द्वारा उनकी वेबसाइट पर उपलब्ध कराई जाएगी। तथापि, यूनिटों द्वारा बह्निस्राव के निपटान के संबंध में पर्याप्त ध्यान दिया जाएगा ताकि जल निकायों और जलभृतों को प्रदूषण से बचाया जा सके।

इस संबंध में विस्तृत दिशा-निर्देश तैयार कर लिए गए हैं और अलग से जारी कर दिए गए हैं।

8.0 आद्र भूमि क्षेत्रों का संरक्षण

देश में आद्र भूमि क्षेत्र बहुत महत्वपूर्ण होते हैं क्योंकि वे ही ऐसे क्षेत्रों में भूजल की उपस्थिति का प्रत्यक्ष प्रतिबिंब होते हैं। आद्र भूमि प्राधिकरणों द्वारा आद्र भूमि क्षेत्रों की सुरक्षा का रखरखाव अलग से किया जा रहा है। चूंकि आद्र भूमि क्षेत्र के अस्तित्व के लिए भूजल बहुत महत्वपूर्ण होता है इसलिए आद्र भूमि क्षेत्र में किसी भी भूजल विकास की गतिविधि से उस क्षेत्र में जल की मात्रा प्रभावित होती है।

आद्र भूमि क्षेत्रों की 500 मीटर परिधि की सीमा के भीतर आने वाली परियोजनाओं को अनिवार्य रूप से एक विस्तृत प्रस्ताव प्रस्तुत करना होगा जिसमें यह दर्शाना होगा कि परियोजना प्रस्तावक द्वारा निकाले जाने वाले भूजल का संरक्षित आद्र भूमि क्षेत्रों पर प्रभाव नही पड़ेगा। इसके अलावा, सीजीडब्ल्यूए से अनुमति लेने से पहले, परियोजना क्षेत्र में अपनी परियोजनाओं को स्थापित करने के लिए उपयुक्त आद्र भूमि प्राधिकरणों से सहमति/अनुमोदन लेना होगा।

9.0 अनापत्ति प्रमाणपत्र में सामान्य अनुपालन की शर्तें

i. एनओसी प्राप्त करने वाले सभी उपयोगकर्ताओं को डिजिटल वॉटर फ्लो मीटर (बीआईएस/आईएस मानकों के अनुरूप) को स्थापित करना और एब्सट्रैक्शन संरचना (ओं) में टेलीमेट्री सिस्टम लगाना अनिवार्य होगा और एनओसी देने के 30 दिनों के भीतर वेब-पोर्टल के माध्यम से सीजीडब्ल्यूए को इसकी स्थापना के बारे में सूचित किया जाएगा।

ii. प्रस्तावकों द्वारा जल प्रवाह मीटर की अधिकृत एजेंसी से अनिवार्य रूप से एक वर्ष में एक बार जांच कराई जाएगी।

iii. प्रस्तावक परियोजना क्षेत्र में छत पर वर्षा जल संचयन और पुनर्भरण प्रणाली स्थापित करेंगे।

iv. प्रस्तावक धारा 6 में दी गई दरों के अनुसार भूजल निष्कर्षण की मात्रा के आधार पर भूजल निकालने/पुनर्भरण शुल्क का भुगतान करेंगे।

v. भूजल स्तर निगरानी के उद्देश्य से निर्मित अवलोकन कुओं (पाईजोमीटर) का निर्माण धारा 15 के अनुसार अनिवार्य होगा। जल स्तर का डाटा सीजीडब्ल्यूए को वेब पोर्टल के माध्यम से उपलब्ध कराया जाएगा। पाईजोमीटर के निर्माण के लिए विस्तृत दिशानिर्देश अनुबंध- II में दिए गए हैं।

vi. प्रस्तावकों को वर्ष में एक बार निष्कर्षण संरचना (ओं) से भूजल की गुणवत्ता की निगरानी करनी होगी। बोरवेल/नलकूपों/खोदे गए कुओं से जल के नमूने को हर साल अप्रैल/मई के दौरान एकत्र किया जाएगा और बुनियादी मानकों (धनायन और आयन), भारी धातुओं, कीटनाशकों/ जैविक यौगिकों इत्यादि का एनएबीएल अधिकृत प्रयोगशालाओं में विश्लेषण किया जाएगा। जल की गुणवत्ता के आंकड़ों को वेब पोर्टल के माध्यम से सीजीडब्ल्यूए को उपलब्ध कराया जाएगा।

vii. यदि एनओसी की वैधता अवधि के भीतर यांत्रिक विफलता के कारण मौजूदा कुंआ अस्तित्व में नहीं रह जाता है, तो उपयोगकर्ता वेब पोर्टल पर सीजीडब्ल्यूए को सूचना देकर इसी तरह का दूसरे कुंए का निर्माण कर सकता है। अप्रचलित कुआं ठीक से सील किया जाएगा (अनुबंध VII का संदर्भ लें)। उपयोगकर्ता को इस संबंध में दस्तावेजी प्रमाण प्रस्तुत करना आवश्यक होगा। यदि मौजूदा निष्कर्षण संरचनाएं जल प्रदान करने में विफल रहती हैं और प्रस्तावक उसी परिसर में एक और ट्यूबवेल ड्रिल करने की इच्छा रखता हैतो प्राधिकरण की पूर्व अनुमति लेना अपेक्षित होगा। यदि प्रतिस्थापन कुएं को दूसरी अलग जगह पर ड्रिल किया जाना हैतो प्रस्तावक को नया एनओसी प्राप्त करना होगा।

viii. जहां कहीं भी संभव हो, वहां रि-साईकिल्ड/अपशिष्ट जल शोधन से ग्रीनबेल्ट (बागवानी) में जल की आवश्यकता को पूरा किया जाएगा।

ix. स्वामित्व परिवर्तन के मामले में, उद्योग के नए मालिक द्वारा परिसर पर कब्जा लेने के 60 दिनों के भीतर दस्तावेजी प्रमाण के साथ एनओसी में आवश्यक परिवर्तनों को शामिल करने के लिए आवेदन करना होगा।

10.0 एनओसी शर्तों के अनुपालन की निगरानी

एनओसी की शर्तों के अनुपालन की निगरानी के लिएकेंद्रीय भूजल प्राधिकरण और राज्य/संघ शासित क्षेत्रों के भूजल प्राधिकरण निम्नलिखित कदम उठाएंगे:

क. अनुपालन निगरानी के लिए उपयुक्त एमआईएस विकसित किया जाएगा।

ख. जिला कलेक्टर/उपायुक्त (डीसी) / जिला मजिस्ट्रेट (डीएम) अनधिकृत भूजल निष्कर्षण संरचनाओं को सील करना, बिजली काटना, एनओसी की शर्तों का उल्लंघन करने वालों के खिलाफ अभियोजन शुरू करना और पर्यावरण क्षतिपूर्ति की कार्रवाई जैसे बाध्यकारी उपायों को करने के लिए अधिकृत हैं।

ग. सक्षम प्राधिकारी के अनुमोदन से सीजीडब्ल्यूबी/ सीजीडब्ल्यूएऔर राज्य भूजल संगठनों के तकनीकी अधिकारियों को निगरानी और आवधिक निरीक्षण की कार्रवाई करने के लिए अधिकृत किया जाता है।

घ. एनओसी शर्तों में किसी भी तरह के उल्लंघन के मामले में, प्रस्तावक धारा 16 के अनुसार दंड का भुगतान करने के लिए उत्तरदायी होंगे।

11.0 एनओसी का नवीनीकरण

एनओसी का समय-समय पर नवीनीकरण किया जाएगा, जिसमें निम्नलिखित शर्तों का अनुपालन किया जाएगा:

i. आवेदक को इसकी वैधता की समाप्ति से कम से कम 90 दिन पहले एनओसी के नवीकरण के लिए आवेदन करना होगा।

ii. एनओसी के नवीकरण का आवेदन अनुपालन रिपोर्ट के साथ होगा।

iii. नवीनीकरण प्रदान करने से पहले, केंद्रीय भूजल प्राधिकरण या राज्य / संघ राज्य क्षेत्र प्राधिकरण को स्वयं को संतुष्ट करेगा कि एनओसी की शर्तों का अनुपालन किया गया है।

iv. मूल्यांकन श्रेणी में परिवर्तन के मामले में, नई श्रेणी में निर्धारित शर्तों के साथ नवीकरण की अनुमति दी जाएगी।

v. निर्दिष्ट शर्तों के अनुसार विभिन्न उपयोगों के लिए एनओसी का नवीनीकरण निम्नानुसार किया जाएगा:

श्रेणी	उपयोग	नवीनीकरण की अवधि
गंभीर, अर्ध-गंभीर और सुरक्षित	पीने और घरेलू उपयोग एवं शहरी जल आपूर्ति एजेंसियों के लिए बुनियादी ढांचा परियोजनाएं	5 वर्ष
	इंडस्ट्रीज	3 वर्ष
	खान	2 वर्ष
अति दोहित	अति-दोहित क्षेत्रों में सभी उपयोगकर्ता	2 वर्ष

vi. यदि नवीनीकरण का आवेदन समय पर प्रस्तुत किया गया है और सीजीडब्ल्यूए / संबंधित राज्य / संघ राज्य क्षेत्र के प्राधिकरण, समय पर आवेदन की प्रक्रिया को आगे बढ़ाने में असमर्थ हैं तोएनओसी को एनओसी के नवीकरण की तारीख से बढ़ाया जाना माना जाएगा।

vii. यदि प्रस्तावक एनओसी की समाप्ति की तारीख से 3 महीने के भीतर नवीकरण के लिए आवेदन करने में विफल रहता हैतो प्रस्तावक पर एनओसी की समाप्ति की तारीख से शुरू होने वाली अवधि और सक्षम प्राधिकारी द्वारा नवीनीकरण किए जाने की तारीख तक पर्यावरण क्षतिपूर्ति के भुगतान का उत्तरदायी होगा।

12.0 एनओसी का विस्तार

यदि प्रस्तावक वास्तविक कारणों से एनओसी की वैधता अवधि में कुएं (ओं) का निर्माण करने में असमर्थ रहता हैतो प्रस्तावक को एनओसी के विस्तार के लिए आवेदन करना होगा। विस्तार के आवेदन में विलंब के कारणों को दस्तावेजों के आधार पर पुष्ट किया जाना चाहिए। एनओसी को विस्तार दिए जाने की अन्य शर्तें, नई एनओसी के समान ही होंगी।

एनओसी को अधिकतम दो वर्षों के लिए बढ़ाया जाएगा। इस बढ़ाई गई अवधि की समाप्ति के बाद इसमें कोई और विस्तार नहीं दिया जाएगा। ऐसी स्थिति में, आवेदक को एनओसी लेने के लिए नए सिरे से आवेदन करना होगा।

13.0 अवैध भूजल निकासी के खिलाफ शक्तियों का प्रत्यायोजन

केंद्रीय भूजल प्राधिकरण ने प्रत्येक राजस्व जिला/ सब डिविजनल के जिला मजिस्ट्रेटों/जिला कलेक्टरों/ सब डिविजनल मजिस्ट्रेटों को प्राधिकृत अधिकारी नियुक्त किया है, जिन्हें अवैध कुओं को सील करने, कुंओं को मिलने वाली बिजली को काटने, उल्लंघन करने वालों के खिलाफ अभियोजन इत्यादि शुरू करने की शक्ति प्रदान की गई है, जिसमें उनके संबंधित अधिकारक्षेत्र में भूजल से संबंधित शिकायतों का निवारण शामिल है।

दिशा-निर्देशों के अनुसार निगरानी और अनुपालन तंत्र को और अधिक विकेन्द्रीकृत और मजबूत बनाने के लिए, राज्यों/संघ राज्य क्षेत्रों के राजस्व और उद्योगों के संबंधित विभागों के अधिकारियों को राज्य/संघ राज्य क्षेत्रों की सरकारों के परामर्श से प्राधिकृत अधिकारी के रूप में नियुक्त किया जाएगा।

सीजीडब्ल्यूए द्वारा एनओसी एप्लीकेशन पोर्टल (एनओसीएपी) में जारी एनओसी की एक प्रति संबंधित जिला मजिस्ट्रेट/जिला कलेक्टर को भेजी जाएगी। केंद्रीय भूजल प्राधिकरण के निर्देशों के उल्लंघन और एनओसी में निर्धारित शर्तों को पूरा न करने की स्थिति मेंप्राधिकृत अधिकारी, पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 15 से 21 के तहत उचित याचिका/मूल आवेदन आदि उचित न्यायालयों में दायर करेंगे।

14.0 भूजल स्तर की निगरानी

भूजल स्तर की निगरानी के लिए सभी परियोजना प्रस्तावकों (10 सीयूएम/डी से अधिक भूजल निकासी) को अपने परिसर के भीतर अनिवार्य रूप से पाईज़ोमीटर (अवलोकन कुओं) का निर्माण करना पड़ता है। अनुपालन शर्तों की ऐसी व्यवस्था यह सुनिश्चित करने के लिए बनाई गई है जिससे कि हर महीने परियोजना क्षेत्र में भूजल स्तर की निगरानी और अवलोकन किया जा सके। इस संबंध में परियोजना प्रस्तावकों द्वारा पाईजोमीटर के माध्यम से जल स्तर की निगरानी के आवश्यक मानदंडों को तालिका 15.1 में दिया गया है।

निर्माण किए जाने वाले पीजोमीटर और जल स्तर निगरानी तंत्र के प्रकार की तालिका **15.1**					
क्र.सं.	भूजल निकासी की मात्रा (सीयूएम/डी)	अपेक्षित पीजोमीटर की संख्या	निगरानी प्रणाली		
			मैनुअल	डीडब्ल्यूएलआर	डीडब्ल्यूएलआरके साथ टेलीमेटरी
1	<10	0	0	0	0
2	11-50	1	1	0	0
3	51-500	1	0	1	0
4	>500	2	0	1	1

पाईजोमीटर उपयुक्त ढंग से स्थापित किया जाएगा जिससे पाईजोमीटर में टैप किए गए जलभृत्त क्षेत्र की समानता पंप्ड कुएं के समान सुनिश्चित हो सके।

15.0 पर्यावरणीय क्षतिपूर्ति

उपयुक्त प्राधिकरण से वैध एनओसी लिए बिना उद्योगों, इंफ्रास्ट्रक्चर इकाइयों और खदान परियोजनाओं द्वारा व्यावसायिक उपयोग के लिए भूजल निष्कर्षण अवैध माना जाएगा और इस तरह के निकाय भूजल निकासी की मात्रा के लिए पर्यावरण क्षतिपूर्ति के भुगतान के लिए उत्तरदायी होंगे। नीचे उल्लिखित केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा निर्धारित मानदंडों का उपयोग पर्यावरणीय क्षतिपूर्ति की गणना के लिए किया जाएगा:

ईसीजीडब्ल्यू = प्रतिदिन भूजल खपत x पर्यावरण क्षतिपूर्ति दर (ईसीआरजीडब्ल्यू) x दिन की संख्या x निवारण घटक

जहां भूजल खपत घन मीटर/ दिन और ईसीआरजीडब्ल्यू रु./ सीयूएम में है

15.1 पर्यावरणीय क्षतिपूर्ति की दरें:

मूल्यांकन इकाइयों की विभिन्न श्रेणियों में अलग-अलग उपयोगकर्ताओं की पर्यावरणीय क्षतिपूर्ति (ईसीआरजीडब्ल्यू) की दरें तालिका 15.1 से 15.3 में दी गई हैं।

तालिका 15.1 : पैकेज्ड पेयजल इकाईयों के लिए ईसीआरजीडब्ल्यू

क्र.सं.	क्षेत्र वर्गीकरण	जल की खपत (सीयूएम/दिन)			
		<200/	200 to <1000	1000 to <5000	5000 & above
		पर्यावरणीय क्षतिपूर्ति दर (ईसीआरजीडब्ल्यू) रु./घन मीमें .			
	सुरक्षित	12	18	24	30
2	अर्ध-गंभीर	24	36	48	60
3	गंभीर	36	48	66	90
4	अति-दोहित	48	72	96	120
टिप्पणी:-न्यूनतम ईसीजीडब्ल्यू 1,00,000/- रुपए से कम नहीं होगा।					

तालिका 15.2: खनन/इंफ्रास्ट्रक्चर डि-वाटरिंग परियोजनाओं के लिए ईसीआरजीडब्ल्यू

क्र.सं.	क्षेत्र वर्गीकरण	जल खपत (सीयूएम/दिन)			
		<200	200 to <1000	1000 to <5000	5000 & above
		पर्यावरणीय क्षतिपूर्ति दर (ईसीआरजीडब्ल्यू) रु./घन मीमें .			
1	सुरक्षित	15	21	30	40
2	अर्ध-गंभीर	30	45	60	75
3	गंभीर	45	60	85	115
4	अति-दोहित	60	90	120	150
टिप्पणी:-न्यूनतम ईसीजीडब्ल्यू 1,00,000/- रुपए से कम नहीं होगा।					

तालिका 15.3: औद्योगिक इकाईयों के लिए ईसीआरजीडब्ल्यू

क्रं.सं.	क्षेत्र वर्गीकरण	जल की खपत (सीयूएम/दिन)			
		<200	200 to <1000	1000 to <5000	5000 & above
		पर्यावरणीय क्षतिपूर्ति दर (ईसीआरजीडब्ल्यू) रु./घन मीमें .			
1	सुरक्षित	20	30	40	50
2	अर्ध-गंभीर	40	60	80	100
3	गंभीर	60	80	110	150
4	अति-दोहित	80	120	160	200
टिप्पणी:-न्यूनतम ईसीजीडब्ल्यू 1,00,000/- रुपए से कम नहीं होगा।					

15.2 नुकसान और पर्यावरणीय क्षति की भरपाई के लिए निवारक कारक (पैकेज्ड पेयजल यूनिट्स, खनन, उद्योग और इंफ्रास्ट्रक्चर से जुड़ी परियोजनाओं के लिए)

अवैध भूजल निष्कर्षण की अवधि के आधार पर निम्नलिखित निवारक कारकों को नुकसान और पर्यावरणीय क्षति की भरपाई का विवरण तालिका 15.4 में दिया गया है।

तालिका 15.4: भूजल निकासी की मात्रा और अवैध निकासी के वर्षों की संख्या के आधार पर निवारक कारक

क्र.सं.	जल की खपत	निवारक कारक		
		< 2 वर्ष	2-5 वर्ष	>5 वर्ष
1	<1000 केएलडी	1.00	1.00	1.25
2	1000-5000 केएलडी	1.00	1.00	1.50
3	>5000 केएलडी	1.00	1.25	2.00

टिप्पणी: केएलडी – किलोमीटर प्रतिदिन

16.0 दंड का प्रावधान

उपयुक्त प्राधिकारी द्वारा जारी एनओसी शर्तों का पालन न करने की स्थिति में प्रस्तावकों पर जुर्माना लगाया जाएगा। एनओसी की विभिन्न शर्तों का पालन नहीं करने की प्रस्तावित दंड की दरें तालिका 16.1 में दी गई हैं। जल शक्ति मंत्रालय में सक्षम प्राधिकारी के अनुमोदन से दंड की दरों की समय-समय पर समीक्षा की जाएगी।

तालिका 16.1: एनओसी शर्तों का अनुपालन न करने पर दंड का प्रावधान

क्र.सं.	मदें	शुल्क रुपए में
1	टेलीमेट्री सिस्टम के साथ स्थापित नहीं होना/ दोषपूर्ण डिजिटल वॉटर फ्लो मीटर।	200000
2	अतिरिक्त भूजल निष्कर्षण संरचनाओं का अप्रकटीकरण/निर्माण क) गैर-कार्यात्मक संरचनाएं। ख) अप्रचलित/ परित्यक्त टिप्पणी: दी गई दरें गैर-कार्यात्मक/अप्रचलित/ परित्यक्त संरचनाओं के लिए हैं। समेकित दंड के लिए इस तरह की संरचनाओं की कुल संख्या के साथ इसे गुणा किया जाएगा।	 200000 100000
3	ताजे जल क्षेत्रों की रिपोर्टिंग आवेदन में ब्रैकिश/लवणता क्षेत्र के रूप में ।	200000
4	पाईज़ोमीटर को स्थापित नहीं किया जाना।	200000
5	दोषपूर्ण डीडब्ल्यूएलआर / टेलीमेट्री प्रणाली / स्थापित नहीं होना	100000
6	पुनर्भरण की अपर्याप्त क्षमता / जल संरक्षण संरचनाओं का निर्माण नहीं होना।	500000
7	पुनर्भरण संरचनाओं का रखरखाव न होना।	200000
8	शोधित / बिना शोधित जल को जलभृत्त प्रणाली में पहुंचाना। नोट: जुर्माने के अलावा, प्रस्तावक पर्यावरण (संरक्षण) अधिनियम, 1886 के प्रावधानों के अनुसार जलभृत्त सुधार लागत वहन करेगा।	1000000
9	जल स्तर / जल गुणवत्ता डाटा को प्रस्तुत नहीं करना।	50000
10	भूजल की दैनिक निकासी/निष्कर्षण आंकडों की लॉग बुक का रखरखाव नही करना।	50000
11	पुनर्भरण संरचना (ओं) की तस्वीर न प्रस्तुत करना।	50000
12	अपनी अनुपालन रिपोर्ट प्रस्तुत न करना।	100000
13	प्राधिकृत/अपंजीकृत ड्रिलिंग रिग्स (प्रति संरचनाओं) द्वारा भूजल निष्कर्षण संरचनाओं का निर्माण।	100000
14	जलापूर्ति टैंकरों का पंजीकरण न करना।	500000
15	गलत सूचना / वचन देना।	100000

मौजूदा जारी एनओसी पत्र में सुधार / संशोधन के लिए शुल्क का भुगतान भी करना होगा। ऐसे शुल्कों का विवरण तालिका 16.2 में दिया गया है।

तालिका 16.2: जारी मौजूदा एनओसी में सुधार / संशोधन के लिए प्रस्तावित शुल्क

क्र.सं.	मदें	शुल्क रुपए में
1	पुनर्भरण मात्रा में बदलाव	10000
2	उपयोगकर्ता आईडी में परिवर्तन।	5000
3	फर्म के नाम में बदलाव	5000
4	एनओसी को बढ़ाया जाना	5000
5	एनओसी को प्रतिरूप में जारी करना	5000
6	एनओसी के शुद्धिपत्र को जारी करना	5000
7	कोई अन्य मद / सुधार आदि	5000

17.0 अन्य महत्वपूर्ण शर्तें (सभी पर लागू):

i. केंद्रीय भूजल बोर्ड/ राज्य भूजल प्राधिकरण से जारी होने वाली वैध एनओसी के बिना किसी व्यक्ति/एजेंसी को भूजल की बिक्री करने की अनुमति नहीं है।

ii. इंफ्रास्ट्रक्चर परियोजनाओं मेंभूजल समावेशन/भंडारण सुनिश्चित करने के लिए पक्के / पार्किंग क्षेत्र को इंटरलॉकिंग / छिद्रित टाइलों या अन्य उपयुक्त उपायों के साथ कवर किया जाना चाहिए।

iii. इंफ्रास्ट्रक्चर परियोजनाओं के मामले में, फर्म/संस्था, परियोजनाओं में दोहरी जलापूर्ति प्रणाली के कार्यान्वयन को सुनिश्चित करेगी। इसका अनुपालन वेब पोर्टल के माध्यम से प्रस्तुत किया जाएगा।

iv. एनओसी में उल्लिखित शर्तों का अनुपालन न करने पर प्रदान की गई एनओसी के रद्द होने / एनओसी के नवीकरण न होने का पर्याप्त कारण माना जा सकता है।

v. संबंधित श्रेणियों में निर्दिष्ट पुख्ता दस्तावेजों के बिना किसी भी आवेदन पर विचार नहीं किया जाएगा।

vi. निष्कर्षण संरचना (ओं) को परियोजना संपत्ति परिसर के अंदर स्थित होना चाहिए।

vii. एनओसी में निर्धारित शर्तों का अनुपालन उपयोगकर्ताओं द्वारा सीजीडब्ल्यूए / राज्य भूजल प्राधिकरण के वेब पोर्टल में ऑनलाइन रिपोर्ट किया जाएगा।

viii. निर्धारित प्रसंस्करण शुल्क, यदि कोई हो, समय-समय पर विभिन्न सेवाओं के लिए, लिया जाएगा।

टिप्पणी:

1. दिशानिर्देश समय-समय पर संशोधन के अधीन हैं।

2. इस दस्तावेज़ में अनुलग्नक सहित हिंदी और अंग्रेजी संस्करणों के बीच किसी भी विसंगति के मामले में, बाद वाला मान्य होगा।

अनुलग्नक I

पेयजल और घरेलू उपयोग के लिए जल की आवश्यकताओं का अनुमान

(स्रोत: नेशनल बिल्डिंग कोड 2016, बीआईएस)

क) आवासीय भवन:

आवास	आबादी
1 शयनकक्ष आवास इकाई	4
2 शयनकक्ष आवास इकाई	5
3 शयनकक्ष आवास इकाई	6
4 शयनकक्ष आवास इकाई और उससे अधिक	7

टिप्पणियां:

1) उपरोक्त आंकड़े सहयोगी कार्मिकों सहित घरेलू परिवारों पर विचार करते हैं, जहां कहीं भी लागू हो।

2) प्लॉट किए गए विकास में घरेलू परिवार इकाइयों की अपेक्षित संख्या और इनके प्रकार पर विचार करने के बाद आबादी का अनुमान लगाया जा सकता है।

3) ईडब्ल्यूएस श्रेणी के तहत आवासीय इकाई में अपेक्षित आबादी 4 होगी और स्टूडियो अपार्टमेंट में अपेक्षित आबादी 2 होगी।

एक सामान्य नियम के अनुसार घरेलू और गैर-घरेलू जरूरतों के लिए प्रति व्यक्ति प्रति दिन निम्नलिखित दरों पर विचार किया जा सकता है:

क) 20,000 तक की आबादी वाले समुदायों के लिए:

1)	स्टैंड पोस्ट के माध्यम से जलापूर्ति:	40 एलपीएचडी (न्यूनतम)
2)	घरेलू सेवा के माध्यम से जलापूर्ति: कनेक्शन	70 से 100 एलपीएचडी

ख) उन समुदायों के लिए: 100 से 135 एलपीएचडी

पूर्ण फ्लशिंग प्रणाली के साथ 20,000

से 100,000 की एक साथ आबादी

ग) उन आबादी वाले समुदायों के लिए: 150 से 200 एलपीएचडी

पूर्ण फ्लशिंग प्रणाली के साथ 100,000

से अधिक आबादी के लिए

टिप्पणी - मौजूदा परिस्थितियों और जल की उपलब्धता पर निर्भरता को ध्यान में रखते हुए मध्यम आय समूह (एमआईजी) और निम्न आय वर्ग (एलआईजी) और आर्थिक रूप से कमजोर वर्ग (ईडब्ल्यूएस) के लिए घरों में प्रति दिन 150 से 200 लीटर प्रति व्यक्ति के हिसाब से की जाने वाली जलापूर्ति को प्रति दिन 135 लीटर तक घटाया जा सकता है। 150 से 200 लीटर प्रति दिन प्रति व्यक्ति में से 45 लीटर प्रति व्यक्ति जल की मात्रा फ्लशिंग और दूसरे घरेलू उद्देश्यों में प्रयोग की जा सकती है।

क. आवासीय इमारतों के अलावा अन्य भवनों में जल की आवश्यकता

क्र. सं.	**भवन का प्रकार**	**घरेलू लीटर प्रति व्यक्ति प्रतिदिन**	**फ्लशिंग लीटर प्रति व्यक्ति प्रतिदिन**	**कुल खपत लीटर प्रति व्यक्ति प्रतिदिन**
1.	कैंटीन सहित कारखाने जहां स्नानगृह उपलब्ध कराना आवश्यक है	30	15	45
2.	कैंटीन सहित कारखाने जहां स्नानगृह उपलब्ध कराना आवश्यक नहीं है	20	10	30
3.	अस्पताल (कपड़े धोना और रसोई को छोड़कर):			
	क) बिस्तरों की संख्या 100 से अधिक नहीं	230	110	340
	ख) बिस्तरों की संख्या 100 से अधिक	300	150	450
	ग) बाह्य रोगी विभाग (ओपीडी)	10	5	15
4.	नर्सों के घर और मेडिकल क्वार्टर	90	45	135
5.	हॉस्टल	90	45	135
6.	होटल (3 सितारा तक) कपड़े धोना, रसोई, कर्मचारियों और जल निकायों को छोड़कर	120	60	180
7.	होटल (4 सितारा और इससे अधिक) कपड़े धोना, रसोई, कर्मचारियों और जल निकायों को छोड़कर	260	60	320
8.	कार्यालय (कैंटीन सहित)	25	20	45
9.	रसोई के लिए अपेक्षित जल सहित रेस्तरां और फूड कोर्ट:			
	क) रेस्तरां	55 प्रति सीट	15 प्रति सीट	70 प्रति सीट
	ख) फूड कोर्ट	25 प्रति सीट	10 प्रति सीट	35 प्रति सीट
10.	क्लब हाउस	25	20	45
11.	स्टेडियम	4	6	10
12.	सिनेमा, कॉन्सर्ट हॉल, थियेटर और मल्टीप्लैक्स	5 प्रति सीट	10 प्रति सीट	15 प्रति सीट
13.	13. स्कूल / शैक्षणिक संस्थान:			
	क) बिना बोर्डिंग सुविधाओं के	25	20	45
	ख) बोर्डिंग सुविधाओं सहित	90	45	135

14.	खरीदारी और खुदरा (मॉल)			
	क) कर्मचारी	25	20	45
	ख) आगंतुक	5	10	15
15.	ट्रैफिक टर्मिनल स्टेशन			
	क) हवाई अड्डे	40	30	70
	ख) स्नान की सुविधा सहित रेलवे स्टेशन (जंक्शन)	40	30	70
	ग) बिना स्नान की सुविधा वाले रेलवे स्टेशन (जंक्शन)	30	15	45
	घ) स्नान की सुविधा सहित रेलवे स्टेशन (इंटरमीडिएट)	25	20	45
	ड) बिना स्नान की सुविधा वाले रेलवे स्टेशन (इंटरमीडिएट)	15	10	25
	च) अंतरराज्यीय बस टर्मिनल	25	20	45
	छ) अंतरराज्यीय बस टर्मिनल/मेट्रो स्टेशन	10	5	15

टिप्पणियां:

1. आगंतुकों के लिए जल की मांग की गणना प्रति दिन प्रति व्यक्ति 15 लीटर की खपत हो सकती है।

2. जल की मांग में रोगियों, परिचारकों, आगंतुकों और कर्मचारियों की आवश्यकता शामिल है। रसोई, कपड़े धोना और क्लीनिकल जल की अतिरिक्त मांग की गणना वास्तविक आवश्यकताओं के आधार पर की जाएगी।

3. कर्मचारियों और विक्रेताओं द्वारा प्रयोग की जा रही सुविधाओं पर विचार करते हुए स्टेशनों द्वारा नियंत्रित किए जाने वाले यात्रियों की औसत संख्या के आधार पर लोगों की संख्या का निर्धारण किया जाएगा।

4. औसत सीजनल पीक आवश्यकताओं पर विचार किया जाना चाहिए।

5. अस्पतालों को श्रेणी क (25 से 50 बिस्तर), श्रेणी ख (51 से 100 बिस्तर), श्रेणी ग (101 से 300 बिस्तर), श्रेणी घ (301 से 500) और श्रेणी ड (501 से 750 बिस्तर) में वर्गीकृत किया जा सकता है।

अनुलग्नक II

पाईजोमीटर के निर्माण और भूजल स्तर और गुणवत्ता की निगरानी के लिए दिशानिर्देश

पाईज़ोमीटर एक बोरवेल/ट्यूबवेल है जिसका उपयोग केवल टेप को घटाकर/साउंडर या स्वचालित / डिजिटली जल स्तर मापने वाले उपकरण के तौर पर किया जाता है। जब भी जरूरत होती है तो जल की गुणवत्ता के परीक्षण के लिए जल नमूना लेने के लिए भी इसका उपयोग किया जाता है। पाईजोमीटर को स्थापित करने के सामान्य दिशानिर्देश निम्नानुसार हैं:

- पंपिंग कुएं से 50 मीटर की न्यूनतम दूरी पर पाईजोमीटर को स्थापित/निर्माण किया जाना होता है जहां से भूजल निकाला जा रहा है। पाईजोमीटर का व्यास लगभग चार इंच से छह इंच होना चाहिए।
- पाईजोमीटर की गहराई पंपिंग कुएं से समान होनी चाहिए, जहां से भूजल निकाला जा रहा है। अगर, एक से अधिक पम्पिंग कुओं का निर्माण एक्वीफर्स को अलग-अलग गहराई पर करने के लिए किया जाता है, तो एक से अधिक पाईज़ोमीटरों को अलग-अलग एक्विफ़र्स को टैप करने वाले कुओं की तरह बनाने की आवश्यकता होगी।
- आसपास के ट्यूबवेल से पंपिंग को लगभग चार से छह घंटे के लिए रोक जाने के बाद ही पाईजोमीटर में जल स्तर की माप ली जानी चाहिए।

- उद्योगों और खनन द्वारा जल की निकासी के लिए प्री-मानसून (अप्रैल / मई) की अवधि के दौरान वर्ष में एक बार भूजल गुणवत्ता की निगरानी की जानी चाहिए। एनएबीएल मान्यता प्राप्त प्रयोगशाला से भूजल के नमूनों का विश्लेषण किया जाना चाहिए।
- मानदंडों और पहचान के लिए पाईज़ोमीटर / ट्यूबवेल की संख्या, गहराई और पाईज़ोमीटर / ट्यूबवेल ज़ोन टैप की जानकारी उपलब्ध कराने के लिए पाईज़ोमीटर / ट्यूबवेल साइट पर एक स्थायी डिस्प्ले बोर्ड स्थापित किया जाना चाहिए।
- मापन के लिए सुरक्षा और पहुंच के संबंध में किसी अन्य साइट की विशिष्ट आवश्यकताओं का ध्यान रखा जा सकता है।

अनुलग्नक III

प्रदूषणकारी उद्योगों / परियोजनाओं के संयंत्र परिसर में प्रदूषण की रोकथाम को सुनिश्चित करने के लिए अपनाए जाने वाले उपाय

यह देखा गया है कि चर्मशोधन, स्लॉटर हाउस, डाई, केमिकल, कोलवाशरी, अन्य खतरनाक इकाइयोंआदि जैसे प्रदूषित उद्योगिक स्थलों में और इसके आसपास के क्षेत्रों में भूजल प्रदूषित होता है। भूजल की गुणवत्ता में और अधिक गिरावट को रोकने के लिए आवश्यक है कि इसको संरक्षित करने के सभी जरूरी उपाय किए जाएं। इस श्रेणी के अंतर्गत आने वाले सभी उद्योग / परियोजनाओं को मौजूदा और नई श्रेणी दोनों के तहत निम्नलिखित प्रक्रिया का पालन करने का निर्देश दिया जाता है।

1. किसी भी नलकूप / बोरवेल / कुएं का निर्माण प्रसंस्करण इकाई के आसपास के क्षेत्र में नहीं किया जाना चाहिए। नलकूप / बोरवेल का निर्माण उस स्थान पर किया जाना चाहिए जहां स्वच्छता हो।

2. असेंबली / केसिंग और पीवीसी (पॉली विनाइल क्लोराइड) के लिए केवल हल्के स्टील पाइप का उपयोग किया जाना चाहिए या इस तरह के अन्य पाइप का उपयोग नहीं किया जाना चाहिए। पीवीसी या इसी तरह के दूसरे पाइप वाले ट्यूबवेल / बोरवेल को छोड़ दिया जाना चाहिए और उसे भर देना चाहिए।

3. नलकूप / बोरवेल के आसपास, आरसीसी (प्रबलित कंक्रीट सीमेंट) 3 मीटर (लंबाई) x 3 मीटर (चौड़ाई) x 2 मीटर (गहराई) की ग्राउटिंग की जानी चाहिए। नलकूप / बोरवेल के पाइप को जमीन के स्तर (1 एमएजीएल) से 1 मीटर ऊपर उठाया जाना चाहिए। किसी भी सतही संदूषण को रोकने के लिए नलकूप / बोरवेल को 0.5 मीटर ऊंचाई और 1.5 मीटर गहराई की आरसीसी दीवार से घिरा होना चाहिए जिससे निर्माणाधीन ट्यूबवेल / बोरवेल में संदूषण को रोका जा सके। योजना / अनुभागीय आरेख को संदर्भ के लिए (परिशिष्ट 1 और 2) में संलग्न किया गया है ।

3. नलकूप / बोरवेल में नॉन रिटर्न वॉल्व लगाया जाना चाहिए जिससे यह सुनिश्चित हो सके कि निर्मित नलकूप / बोरवेल का उपयोग केवल भूजल निष्कर्षण के लिए किया जाता है।

4. किसी भी समय निर्माणाधीन नलकूप / बोरवेल / पाईजोमीटर में जल या तरल पदार्थ नहीं जाना चाहिए।

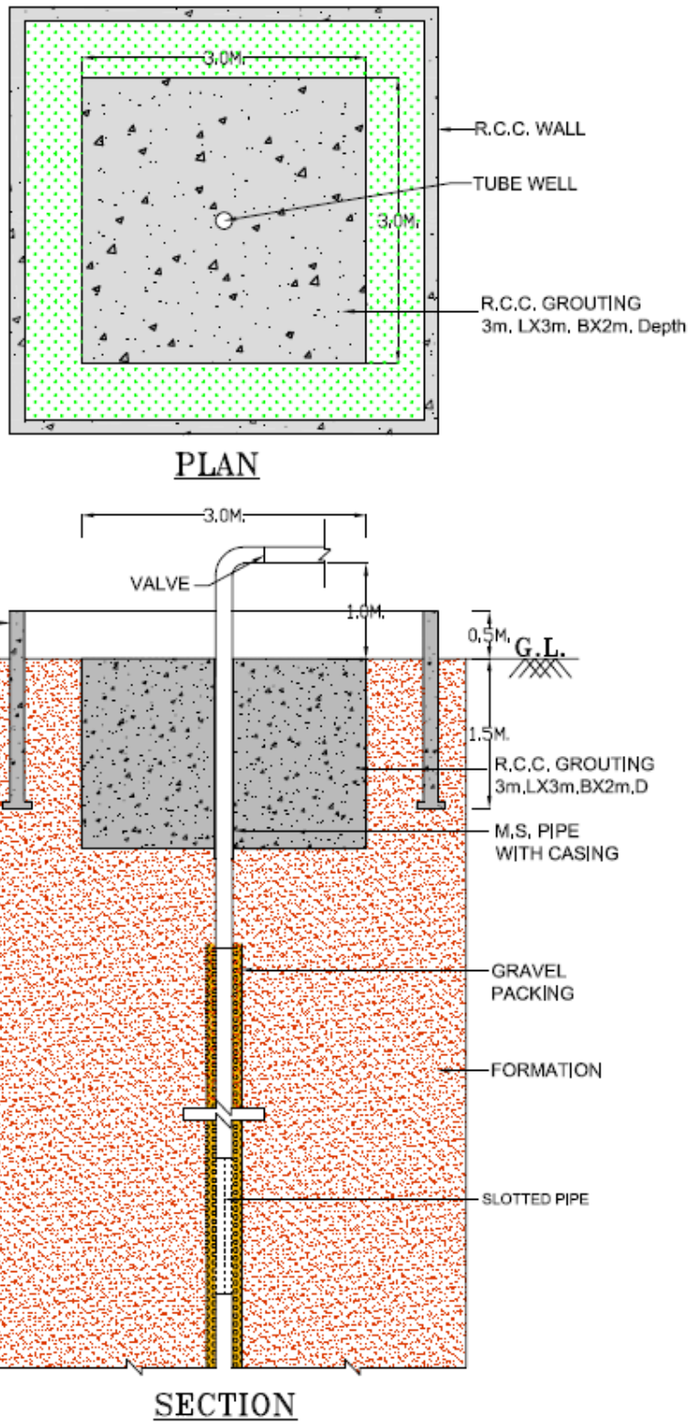
5. इस श्रेणी के अंतर्गत आने वाले उद्योगों / परियोजनाओं को संयंत्र परिसर के भीतर किसी भी तरह के पुनर्भरण उपाय लागू नहीं करने चाहिए।

6. एसटीपी (सीवेज ट्रीटमेंट प्लांट) या ईटीपी (एफ्लुएंट ट्रीटमेंट प्लांट) के आसपास के क्षेत्र में स्थित किसी भी नलकूप / बोरवेल को छोड़ दिया जाना चाहिए और उसे भर देना चाहिए।

7. निगरानी के उद्देश्य से बनाए जाने वाले पाइजोमीटर में नलकूप / बोरवेल के निर्माण में अपनाई जाने वाली प्रक्रिया का पालन होना चाहिए।

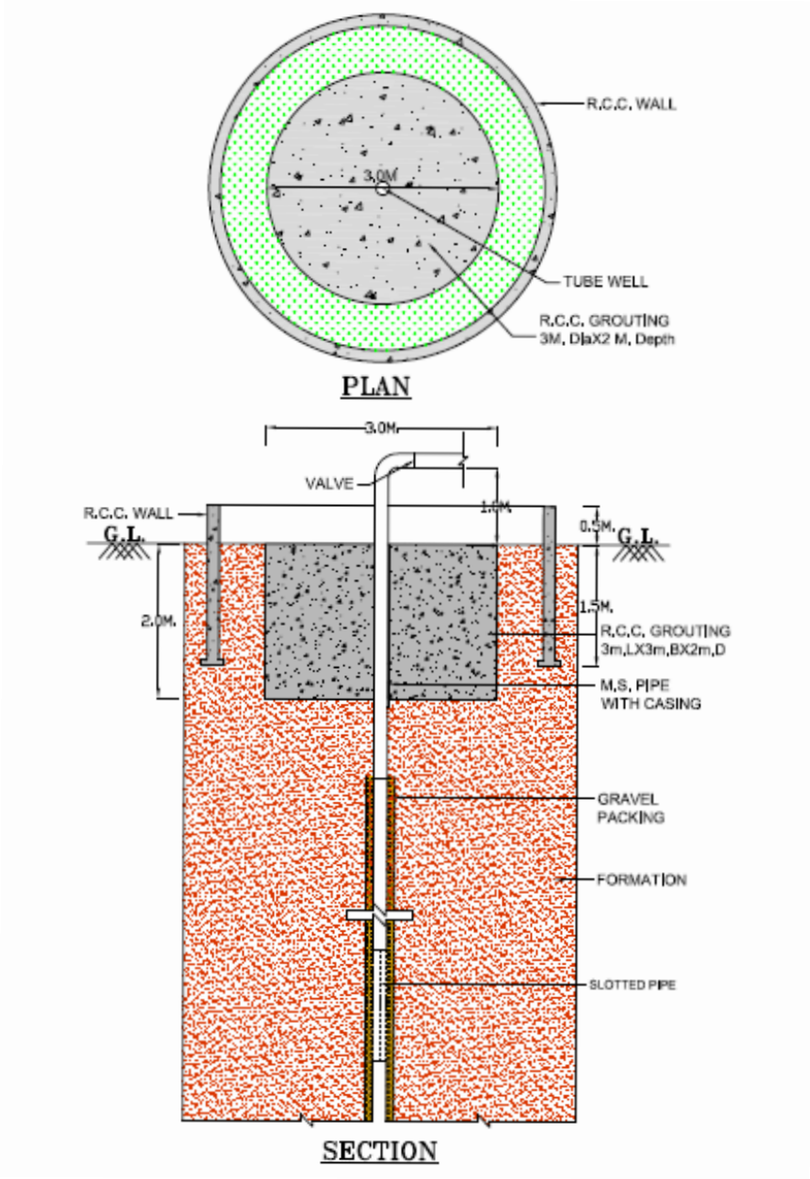
परिशिष्ट 1

कुएं की ऊपरी हिस्से को सुरक्षित करने की योजना / अनुभागीय आरेख



परिशिष्ट 2

कुएं की ऊपरी हिस्से को सुरक्षित करने की योजना / अनुभागीय आरेख



अनुबंध- IV

<u>उद्योगों द्वारा एनओसी प्राप्त करने के लिए हाइड्रो-जियोलॉजिकल रिपोर्ट की रूपरेखा</u>

1. प्रस्तावित परियोजना के बारे में परियोजना क्षेत्र का सीमांकन करते हुए इसकी जगह का विवरण, निर्देशांक, गूगल / टोपोशीट मानचित्र आदि का संक्षिप्त विवरण।

2. परियोजना और उसके आसपास के क्षेत्र में जल स्तर और इसकी गुणवत्ता के आंकड़ों एवं नक्शों सहित इससे जुड़े मुद्दों को शामिल करते हुए भूजल की स्थिति, यदि कोई हो। खदान के मामले में, कोर और बफर ज़ोन दोनों में भूजल स्थिति का वर्णन किया जाना चाहिए।

3. प्रस्तावित निर्माणाधीन ट्यूबवैल / बोरवेल का विवरण। इसमें ड्रिलिंग गहराई, व्यास, संभावित लिथोलॉजिकल लॉग, कम किए जाने वाले पंप का विवरण,पंप का एच.पी., नलकूपों / बोरवेलों की संभावित निकासीआदि को शामिल किया जाता है। जगहों को साइट योजना / मानचित्र पर चिह्नित किया जाना चाहिए। प्रस्तावित पाईजोमीटर की जगह।

4. परियोजना और उसके आसपास क्षेत्र में किए गए जियो-फिजिकल अध्ययनों का विवरण। परियोजना वाले ब्लॉक में भूजल संसाधन की गणना।

5. खदानों के मामले में स्वीकृत खदान योजना और खान / इंफ्रास्ट्रक्चर परियोजनाओं के मामले में विस्तृत डि-वाटरिंग परियोजनाएं।

6. खनन / इंफ्रास्ट्रक्चर डि-वाटरिंग परियोजनाओं के मामले में पंप किए गए जल का प्रस्तावित उपयोग।

7. परियोजना और उसके आसपास क्षेत्र में भूजल पर पड़ने वाले प्रभाव का व्यापक मूल्यांकन और इसके जोखिमों को उजागर करते हुए किसी भी महत्वपूर्ण पर्यावरणीय मुद्दों के समाधान के लिए प्रस्तावित प्रबंधन रणनीतियां।

8. लवणता युक्त जल निकालने वाले उद्योगों द्वारा अपशिष्ट जल के निपटान के लिए प्रस्तावित उपाय।

9. जल संरक्षण के लिए अपनाए जाने वाले उपायों में रि-साइक्लिंग, पुन: उपयोग, शोधन आदि उपाय शामिल हैं, इसमें फर्म द्वारा अपनाए जा रहे जल संतुलन चार्ट के साथ-साथ अपनाए जाने वाले जल संरक्षण के तरीके भी शामिल रहते हैं।

- परियोजना के अंतर्गत मौजूदा / प्रस्तावित एसटीपी / ईटीपी / सीईपीटी की क्षमता और प्रवाह चार्ट का संक्षिप्त लेख।

- भूजल बचाने के लिए अपनाए जाने वाले जल संरक्षण उपायों का विवरण।

- विभिन्न प्रक्रियाओं में जल के उपयोग को दर्शाने वाला कुल जल संतुलन चार्ट।

10. परियोजना से संबंधित कोई अन्य विवरण।

अनुलग्नक-V

भूजल स्थितियों पर रिपोर्ट का फार्मेट

- परिचय
- परियोजना वर्णन
- पृष्ठ भूमि
- लक्ष्य और अवसर
- क्षेत्रीय व्यवस्था
- स्थान
- भूमि उपयोग
- जलवायु
- स्थालाकृति और जल निकास
- भूविज्ञान-क्षेत्रीय और स्थानीय

– सामान्य हाइड्रोज्योलॉजी (जलीय प्रकार, जलीय गहराई, जोन टेप- किया गया आदि) भूजल स्थिति (कोर और बफर जोन में)

  भूजल गुणवत्ता के जल स्तर में स्थानिक और लैकिक भिन्नता (छिछला और गहरा जलभृत)

– स्थानीय भूजल पर भूजल निष्कर्षण का प्रभाव जल स्तर का जलारेख/निगरानी कुओं में दाबमापी ऐतिहासिक और जल स्तर के प्रचलन विश्लेषण शुद्ध विश्लेषण है। (भूजल के बहाव की दिशा)

  अनुमोदित खनन योजना के अनुसार वर्षावार/बेंचवार खन जल निष्कासन का अभिकलन

– निष्कर्ष

अनुलग्नक-VI

परियोजनाओं के आधारभूत संरचना का निर्देशात्मक सूची

वाणिज्यिक इमारतों सहित आवासीय नगर क्षेत्र

कार्यालय इमारत

विद्यालय कॉलेज

विश्वविद्यालय

सेज

मेट्रो स्टेशन

बस डिपो

हाइवे आधार भूत संरचना

दमकल केन्द्र

गोदाम

व्यापार प्लाजा

मॉल और मल्टीप्लेक्स

अस्पताल

नर्सिंग होम

रिजोर्ट

होटल/रेस्टोरेन्ट/फुड प्लाजा

होलीडे होम/अतिथि गृह/छात्रावास

बैंक्वेट हॉल/

मैरिज गार्डन

आईटी कॉम्प्लेक्स

आईटी कॉम्प्लेक्स

लॉजिस्टिक एण्ड कारगो

क्लबस

व्यापार केन्द्र

अनुलग्नक-VII

2009 के सिविल रिट याचिका में सुपर्रिम कोर्ट के आदेश में परिव्यक्त वेध कूपों और नल कूपों में उनके गिरने के कारण छोटे बच्चों के घातक दुर्घटनाओं के रोकथाम के लिए पैमाना जवाब में परिव्यक्त वेध कूपो और नल कूलों में उनके गिरने के कारण छोटे बच्चों के घातक दुर्घटनाओं के रोकथाम के लिए पैमाना भारतीय संघ और संगठन उत्तर देने वाला आदेश वर्तमान रिट याचिक में कुछ नहीं है, विषय में हल्के, इसके साथ न्यायालय के आदेश दिनांक 11 फरवरी, 2010के जारी किये गए आपेक्षित दिशा-निर्देश देखिए।

वह संशोधन इस प्रकार है:

i) जमीन/परिसर के मालिक को वेध कूप/नल कूप बनाने के लिए कोई कदम उठाने से पहले क्षेत्र में संबंधित अधिकारी को लिखित में सूचना देना चाहिए, जो है, जिलाधिकारी, जिला मजिस्ट्रेट/ग्राम पंचायत के सरपंच/कोई अन्य सांवधिक अधिकारी/भूजल विभाग के संबंधित अधिकारी/लोक स्वास्थ्य/नगर निगम, जैसा मामला हो सकता है, वेध कूप/नल कूल के निर्माण के लिए।

ii) सभी ड्रिलिंग ऐजेंसियों का पंजीयन, मुख्यत: सरकारी/अर्द्ध सरकारी निजीइत्यादि जिला प्रशासन/वैधानिक अधिकारी जहां भी लागू हो के साथ अनिवार्य होना चाहिए।

iii) निम्नलिखित विवरण के साथ कुएं के समीप निर्माण के समय पर सूचना पटठ् की स्थापना:-

(क) कुएं के सुधार/निर्माण के समय पर ड्रिलिंग ऐजेंसी का पूरा पता।

(ख) कुएं के मालिक/उपयोग करने वाले ऐजेंसी का पूरा पता

iv) निर्माण के दौरान कुएं के चारों ओर कांटेदार तार घेराबंदी या कोई अन्य उपयुक्त घेरा का स्थापना।

v) कुएं के चारों और के आवरण से (0.30 मीटर जमीन स्तर से ऊपर और 0.30 मीटर जमीन स्तर से नीचे) 0.50x0.50x0.60 मीटर की दूरी पर कोंक्रीट प्लेट फार्म/सिमेंट का निर्माण।

vi) बोल्ट्स और नट्स के साथ पाइप के आवरण को फिक्स करने के लिए मजबूत कैप उपलब्ध कराते हुए स्टील की वेल्डिंग द्वारा कुएं के सज्जीकरण का कैपिंग।

vii) पम्प मरम्मत के मामले में नल कूल को खुला नहीं छोडना चाहिए।

viii) कार्य के पूरे होने के पश्चात् कीचड के गडेढ और नाली को भरना।

ix) परित्यवत वेध कूपों को नीचे से जीमन स्तर तक मिट्टी/रेत/पत्थर/कंकड/ड्रिल कटिंग आदि से भरना।

x) खास जगह पर ड्रिलिंग प्रचालन के पूरे होने पर, ड्रिलिंग के शुरू होने से पहले जमीन के स्थिति का मरम्मत करना।

xi) जिलाधिकारी को सत्यापित करने अधिकार होना चाहिए कि उपरोक्त निशा-निर्देश को अनुसरण ओर उचितनिगरानी किया जा रहा है, केन्द्रीय सरकार ऐजेंसियों/संबंधित राज्य द्वारा नल कूपों/वेध गडढों की स्थिति के विषय में जांच का ख्याल रखा जा रहा है।

xii) जिला स्तर पर जिला/प्रखण्ड/ग्राम-वार ड्रिल्ड नल कूपों/वेध कूपों की स्थिति जिला/प्रखण्ड/ग्राम-वार अर्थात् उपयोग में कूपों की संख्या, परित्वक्त वेध कूप/खूले पायेगए नल कूपों की संख्या, परित्वक्त वेध कूपों/जमीनी स्तर तक उचितसे भरे गए नल कूपों और परित्यक्त वेध कूपों/जमीनी स्तर तक भरे गये नल कूपों को बनाए रखा जाता है।

ग्रामीण क्षेत्रों में उपरोक्त निगरानी कृषि विभाग से कार्यपालक और ग्राम सरपंच द्वारा किया जाता है। गहरी क्षेत्र के मामले मामले में, उपरोक्त निगरानी कनिष्ठ अभियंता और संबंधित भूजल विभाग से कार्यपालक/लोक स्वास्थ्य/नगर निगम आदि द्वारा किया जाता है।

xiii) यदि कोई स्तर पर परित्यक्त वेध कूप/नल कूप है, तो संबंधित भूजल विभाग/लोक स्वास्थ्य/नगर निगम/निजी ठेकेदार आदि से एक प्रमाण पत्र पूर्व कथित एजेंसी द्वारा लेनी चाहिए कि परित्यक्त वेध कूल और नल कूप उचितरूप से जमीन स्तर तक भरा गया। संबंधित विभाग/ऐजेंसी के कार्यपालक द्वारा बिना सोचे समझे जांच किया जाना है। उपरोक्त ऐसी सभी आंकडों की सूचना राज्य के प्रखण्ड विकास कार्यालय/जिला अधिकारी के पास उपलब्ध होनी है।

हमें सूचना दिया गया कि दिनांक 11 फरवरी, 2010 के पहले आदेश का अंतिम पैराग्राफ से संबंधित पब्लिसिटी का विधिवत अनुपालन किया गया है।

उपरोक्त के अधिन, रिट याचिका का निपटारा किया गया है।

.....सीजेआई

[एस.एच.कपाडिया]

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के.एस. राधाकृष्णन

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स्वतंत्र कुमार

नई दिल्ली,

06 अगस्त, 2010

अनुलग्नक-VIII

सीजीडब्ल्यूए द्वारा राज्यों/संघीय प्रदेशों की सूची जहां भूजल निकर्षण नियंत्रित किया जाता है-

1. अंडमान और निकोबार
2. असम
3. अरूणाचल प्रदेश
4. बिहार
5. छत्तीसगढ
6. दादर और नगर हवेली और दमन और द्वीव
7. गुजरात
8. हरियाणा
9. झारखंड
10. मध्य प्रदेश
11. महाराष्ट्र
12. मणीपुर
13. मेघालय
14. मिजोरम
15. नागालैंड
16. ओडिशा
17. पंजाब
18. राजस्थान
19. सिक्किम
20. त्रिपुरा
21. उत्तर प्रदेश
22. उत्तराखंड
23. आंध्र प्रदेश (केवल खनन परियोजनाएं)
24. तेलंगाना (केवल खनन परियोजनाएं)

अनुलग्नक-IX

प्रयुक्त तकनीकी शब्दों के शब्दावली

1) **सुरक्षित क्षेत्र**: सीजीडब्ल्यूबी और राज्य भूजल संगठनों द्वारा संयुक्त रूप से किए गये नवीनतक भूजल संसाधनों के आकलन के आधार पर भूजल संसाधनों की दृष्टिकोण से सुरक्षित के रूप में वर्गीकृत किया गया है। एनओसीएपी और सीजीडब्ल्यूबी के वेबसाइट पर विवरण उपलब्ध है।

2) **अर्द्ध-नाजुक क्षेत्र**: सीजीडब्ल्यूबी और राज्य भूजल संगठनों द्वारा संयुक्त रूप से किए गये नवीनतम भूजल संसाधनों के आकलन के आधार पर भूजल संसाधनों की दृष्टिकोण और सीजीडब्ल्यूबी के वेबसाइट पर विवरण उपलब्ध है।

3) **नाजुक क्षेत्र**: सीजीडब्ल्यूबी और राज्य भूजल संगठनों द्वारा संयुक्त रूप से किये गये नवीनतम भूजल संसाधनों के आकलन के आधार पर भूजल संसाधनों की दृष्टिकोण से नाजुक के रूप में वर्गीकृत किया गया है। एनओसीएपी और सीजीडब्ल्यूबी के वेबसाइट पर विवरण उपलब्ध है।

4) **अतिदोहित क्षेत्र**: सीजीडब्ल्यूबी और राज्य भूजल संगठनों द्वारा संयुक्त रूप से किये गये नवीनतम दृष्टिकोण से अतिदोहित के रूप में वर्गीकृत किया गया है। एनओसीएपी और सीजीडब्ल्यूबी के वेबसाइट पर विवरण उपलब्ध है।

5) **जलभृत**: भूवैज्ञानिक संरचना भूजल संचारण और भंडारण के लिए सक्षम है।

6) **गहरा जलभृत**: बहुधा जलभृत प्रणाली के क्षेत्र में ऊपर वाले जलभृत के नीचे जलभृत घटित हुई।

7) **कुंआ**: भूजल के निष्कषर्ण के लिए उपयोग किया जाने वाला कोई भी ढांचा, जिसमें खुले कुएं खोदे गए कुएं, बोरवेल, खोदने वाले कुएं , नल कूल, फिल्टर प्वांइट, कलेक्टर कुएं , घुसपैठ गैलरियां, रिचार्ज कुएं या उनके किसी भी संयोजन या विविधताएं शामिल है।

8) **सरकारी ऐजेंसी**: केन्द्रीय या राज्य सरकार का निकाय हो सकता है।

9) **आपूर्तिकत्ती** : सरकार/सरकार ने जल आपूर्ति ऐजेंसी को मंजूरी दी।

10) **खनन** : खनन के पश्चात् परित्यक्त क्षेत्र या क्षेत्र जहां खनन गतिविधियां चल रही है।

11) **गैर कानूनी भूजल निष्कर्षण संरचना**: केन्द्रीय जल प्राधिकरण से ठोस एनओसी के बिना भूजल को निकालने के लिए प्रयोग किया जा रहा है जो कोई ऊर्जावान निष्कर्षण संरचना है अर्थात डगवेल, नलकूप, वैध कूप।

12) **वर्षाजल संचयन**: भूजल के रिचार्ज के लिए या भविष्य के उपयोग के लिए रूफ-टॉप संचयन को शामिल करते हुए सूक्ष्म जल विभाजक पैमान पर वर्षाजल के भंडारण और जमाव की प्रणाली और तकनीक।

13) **खनन परियोजना**: परियोजना जो खनन गतिविधि को शामिल करती है या तो खुली कास्ट या भूमिगत या दोनों।

14) **भूजल प्रारूप**: भूजल निकासी का अपेक्षित मात्रा।

15) **लवणीय जल**: 25° से. पर 2500M साइमेन्स/से.मी. की अधिकता में लवणता वाला जल युक्त जल।

16) **वाटर टेबल इंटरसेक्शन** : खनन या अन्य गतिविधियों के कारण ऑवर लेईंग सामग्री की खुदाई पर जल वाटर टेबल इंटरसेक्शन।

17) **पेय और घरेलू उपयोग**: पेय और घरेलू उपयोग के अलावा, यह श्रेणी अस्पताल, होटल, मॉल और मल्टीप्लेक्स संस्थाने, कार्यलय बैंकेट हॉल, फायर स्टेशन, मेट्रो स्टेशन, रेलवे स्टेशन, हवाई अड्डा, बंदगाह, स्टेडियम आदि औद्योगिक प्रक्रिया के लिए आवश्यक जल नहीं ब्लकि औद्योगिक के पेय जरूरतों को कवर करेगी।

18) **रिसाइकल/पुन: उपयोग**: विभिन्न उद्देश्यों के लिए ट्रिटेड वेस्ट जल का उपयोग/बहुल उपयोग के लिए जल को रखना।

19) **सरकारी विभाग** : केन्द्रीय या तो राज्य।

20) **नगरपालिका** : नगरपालिका, नगर निगमया अन्य दूसरे नाम द्वारा स्थानीय शहरी शासन का समान निकाय।

21) **भूजल** : पानी जो संतृप्ति के क्षेत्र में सतह के नीचे मौजूद है और कुओं या किसी अन्य माध्यम से निकाला जा सकता है या झरनों और नदियों में झरनों और आधार प्रवाह के रूप में उभरता है।

22) **बीजीएल** : जमीनी स्तर के नीचे।

23) **बीसएम** : बिलियन क्यूबिक मीटरस्।

24) **भूजल निष्कर्षण संरचना** : भूजल निकासी के लिए प्रयुक्त संरचना जैसे वैध कूल/नल कूप/डगवेल/डग कम बोर वेल/सुरंग कुआं।

25) **अवलोकन कुआं या पीजोमीटर** : एक बोरवेल/जल स्तर मापने के लिए केवल प्रयुक्त नल कूप/पाईजोमेट्रिक हेड और समय-समय पर पानी का नमूना लेने के किया जाता है, लेकिन भूजल पृथक्करण के लिए इसका उपयोग नहीं किया जाता है।

26) **वाटर ऑडिट** : पानी के उपयोग को कम करने और अक्सर अनावश्यक पानी के उपयोग पर पैसे बचाने के उद्देश्य से सरल या जटिल प्रणालियों में पानी की उपयोग की मात्रा निर्धारित करने की एक विधि।

27) **भूजल प्रदूषण** : यदि भूजल में किसी भी पैरामीटर की सांद्रता भारतीय मानक ब्यूरो द्वारा निर्धारित पेयजल की अधिकतम अनुज्ञेय सीमा से अधिक है।

28) **सहकारी समूह हाउसिंग सोसायटी/बिल्डर फ्लैट**: एक हाउसिंग सोसायटी एक आवासीय परिसर के भीतर घर के मालिकों द्वारा गठित एक सोसायटी है। गठित हाउसिंग सोसायटी को औपचारिक रूप से सहकारी समितियों के रजिस्ट्रार के साथ पंजीकृत होना चाहिए।

29) **केएलडी** - प्रतिदिन कि.मी

30) **ईसीजीडब्ल्यू** - अवैध भूजल निकासी के लिए पर्यावरण क्षतिपूर्ति।

31) **ईसीजीडबल्यूआर** – अवैध भूजल निकासी के लिए पर्यावरण क्षतिपूर्ति दर।

अनुलग्नक-X

उद्योगों द्वारा वार्षिक वाटर ऑडिट (स्रोत-(11)

वाटर ऑडिट उद्देश्यपूर्ण तरीके से वितरण प्रणाली के माध्यम से जल की निकासी या उपचार के स्थल से जल के प्रवाह को मापकर और इसका उपयोग किये जाने वाले क्षेत्रों में और अंतत: छोड दिया जाता है। वॉटर ऑडिट आयोजित करने में जलके संतुलन की गणना, जल का उपयोग और जल का बचत के तरीकों की पहचान करना शामिल है।

वाटर ऑडिट में प्रारंभिक जल सर्वेक्षण और विस्तृत जल लेखा शामिल है। प्रारंभिक जल सर्वेक्षण संयंत्र गतिविधियों, जल की खपत और जल निर्वहन पैटर्न और जल बिलिंग, दरों और जल उपकर के बोर में पृष्ठभूमि की जानकारी एकत्र करने के लिए किया जाता है। उद्योग से एकत्र किए गए माध्यमिक आंकडों के विश्लेषण के बाद, विस्तृत जल ऑडिट आयोजित की जाती है, जिसमें निम्नलिखित चरण शामिल है:-

- साइट पर प्रशिक्षण और सुविधा प्रबंधक और कर्मियों के साथ चर्चा
- जल प्रणाली विश्लेषण
- आधारभूत जल मानचित्र का परिमाप
- दबाव और प्रवाह मीटर और विभिन्न अन्य उपकरणों का उपयोग करके निगरानी और माप
- अक्षमताओं और लीक की मात्रा
- पानी की गुणवत्ता लोड और निर्वहन की मात्रा

- प्रवाह और गुणवत्ता मानकों में परिवर्तनशीलत की मात्रा
- जल उपचार और पुन: उपयोग का प्रत्यक्ष उपयोग के लिए रणनीतियां।

एक विस्तृत जल संतुलन आखिरकर विकसित होता है। विभिन्न विभिन्न उपयोगकर्त्ता क्षेत्रों में पानी की गुणवत्ता की आवश्यकता गैप की गई है, जो रीसाइकल और पुन: उपयोग के अवसरों को विकसित करने में मदद करता है।

विस्तृत वाटर ऑडिट रिपोर्ट में निम्नलिखित शामिल हैं:

- पानी की खपत और अपशिष्ट जल उत्पादन पैटर्न
- विशिष्ट जल का उपयोग संरक्षण
- सुविधाका पूर्ण जल संतुलन
- जल के बचत के अवसर
- प्रस्तावों को लागू करने की विधि
- पूर्ण विवरण और आंकडें
- निवेश की आवश्यकता

जल संरक्षण के लिए उद्योग निम्नलिखित उपाय कर सकते हैं:-

- जल बजट के लिए मानदंड स्थापित करना
- जल के खपत को कम करने के लिए औद्योगिक प्रक्रिया का आधुनिकीकरण
- पुन: परिसंचारी शीतलन प्रणाली के साथ पुनर्चक्रित जल
- ओजोनेशन कूलिंग वाटर एप्रोच जिसके परिणाम स्वरूप पारंपरिक रासायनिक उपचार की तुलना में पांच गुना कमी हो सकती है।
- कुल प्लेनम फ्लश को समाप्त करके डी आयोनाइज्ड जल के पुन: उपयोग में कभी, निरंतर प्रवाह से एक आरंतरिक प्रवाह प्रणाली में परिवर्तन करना और उपयोग पर नियंत्रण में सुधार करना
- बागवानी के लिए अपशिष्ट जल का उपयोग
- निपटान के मानदंडो का पालन करने के लिए अपशिष्टों का उचित प्रसंस्करण।

MINISTRY OF JAL SHAKTI

(Department Of Water Resources, River Development And Ganga Rejuvenation)

(CENTRAL GROUND WATER AUTHORITY)

NOTIFICATION

New Delhi, the 24th September, 2020

S.O. 3289(E).—WHEREAS, on the directions of Hon'ble Supreme Court vide its order dated the10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government constituted the Central Ground Water Authority (hereafter referred to as the 'Authority') vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under Section 5 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water management and development and to exercise certain powers and perform certain functions relating thereto;

AND WHEREAS, the Authority has been regulating ground water development and management by way of issuing 'No Objection Certificates' for ground water extraction to industries or infrastructure projects or Mining Projects etc., and framed guidelines in this connection from time to time in twenty two States and two Union territories, where ground water development is not being regulated by the State Government Union Territory administration concerned;

AND WHEREAS, some of the State Governments or, Union territories enacted legislations and issued regulatory directions or orders for regulating ground water development and management;

AND WHEREAS, the Hon'ble National Green Tribunal, New Delhi vide order dated the 15th April 2015 in OA Nos. 204/205/206 of 2014 has issued directions to the Authority to ensure that any person operating tube-well, or any means to extract ground water shall obtain permission from the Authority and shall operate the same subject to the law in force, even if such unit is existing unit or the unit is yet to be established;

AND WHEREAS, the said Hon'ble Tribunal vide its order dated the 09th July, 2015 in OA Nos. 34 and 37 of 2014 directed all industrial units which are members of the Common Effluent Treatment Plants (CETPs) to approach the Authority through State Pollution Control Board for obtaining 'No Objection Certificate' in accordance with the law;

AND WHEREAS, the aforesaid Hon'ble Tribunal vide order dated the 13th July, 2017 in OA No 200- of 2014 directed that every industry should be directed to pay for extraction of such water, that too, subject to the conditions stated in the order permitting such extraction;

AND WHEREAS, the said Hon'ble Tribunal vide its order dated the 28th August, 2018 in O.A. Nos. 176 of 2015 and 59 of 2012 respectively directed the Ministry of Water Resources, River Development and Ganga Rejuvenation to forthwith review the existing mechanism so as to ensure effective steps for conserving the groundwater resources;

AND WHEREAS, in pursuance of the directions of the Hon'ble National Green Tribunal and powers conferred by sub-section (3) of section 3 and section 5 of the Environment (Protection) Act, 1986 the Authority, with a view to protect the ground water resources had circulated the draft guidelines for grant of 'No Objection Certificate' on the 11th October, 2017 inviting comments and suggestions from all the stakeholders;

AND WHEREAS, all objections and suggestions received in response to the said draft guideline have been duly considered by the Central Government, the Authority notified the guidelines to regulate groundwater over-exploitation and to conserve the groundwater resources in the country vide notification number S.O. 6140 (E), dated the 12th December, 2018;

AND WHEREAS, the aforesaid Hon'ble Tribunal vide order dated the 03rd January 2019 in the OA No. 176 of 2015 directed that the above mentioned notification dated the 12th December, 2018 may not be given effect to as it is unsustainable if tested on 'Precautionary Principle, Sustainable development as well as Inter-generational Equity Principles' and if implemented, will result in fast depletion of groundwater and damage to water bodies and will be destructive of the fundamental right to life under Article 21 of the Constitution of India;

AND WHEREAS, the said Hon'ble Tribunal vide order dated the 11th September, 2019 constituted a committee to deliberate on steps for preventing depletion of groundwater, robust monitoring mechanism

against unauthorised extractions and fulfillment of 'No Objection Certificate' conditions, environment compensation etc and to submit a report;

AND WHEREAS, the aforesaid committee submitted the report along-with draft guidelines to regulate groundwater extraction and groundwater conservation in Hon'ble Tribunal on the 16th March, 2020;

AND WHEREAS, the above said Hon'ble Tribunal vide order dated the 20th July, 2020 directed to comply with certain points for sustainable groundwater management while issuing 'No Objection Certificates' to commercial establishments by the Authority;

Now therefore, in pursuance of the directions of Hon'ble National Green Tribunal and the powers conferred by sub-section (3) of Section 3 read with Section 5 of the Environment (Protection) Act, 1986 (29 of 1986), the Department of Water Resources, River Development & Ganga Rejuvenation, hereby notifies the guidelines to regulate and control groundwater extraction in the country in supersession to this Ministry notification vide S.O. 6140 (E), dated the 12th December, 2018 as per the Schedule below:

SCHEDULE

Guidelines to regulate and control ground water extraction in India

(with immediate effect)

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[F. No. CGWA-21/4/2020-CGWA]

ASHISH KUMAR, Director

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Guidelines to regulate and control groundwater extraction in India

Preamble and Background:

On the directions of Hon'ble Supreme Court vide its order dated 10th December, 1996 passed in Civil writ Petition No 4677 of 1985, MC Mehta Vs Union of India, the Central Government had constituted the Central Ground Water Board as Authority vide notification number S.O. 38 (E), dated the 14th January, 1997 to exercise powers under sub section (3) of section 3 of the Environment (Protection) act, 1986 (29 of 1986) for the purposes of regulation and control of Ground Water Management and Development and to exercise certain powers and perform certain functions as per the said Act.

The Authority has been regulating ground water development and management by way of issuing 'No Objection Certificates' for ground water extraction to industries or infrastructure projects or Mining Projects etc., and framed guidelines in this connection from time to time applicable in twenty two States and two Union territories, where ground water development is not being regulated by the State Government and Union territory administration concerned.

To have sustainable management of water resources in the country groundwater abstraction guidelines have been prepared to regulate groundwater extraction and conserve the scarce groundwater resources in the country.

These guidelines will come into force with immediate effect from the date of Gazette Notification and will supersede all earlier guidelines issued by the Central Ground Water Authority (CGWA).

These guidelines will have pan India applicability. Ground water abstraction in States/ Uts (which are not regulating ground water abstraction) shall continue to be regulated by Central Ground Water Authority.

Further, wherever States/ Uts have come out with their own groundwater abstraction guidelines, which are inconsistent with the CGWA guidelines, the provisions of CGWA guidelines will prevail. However, in case the guidelines followed by such States/ Uts contain some more stringent provisions than CGWA guidelines, such provisions may also be given effect to by the States/ Uts Authorities in addition to those contained in the CGWA guidelines. States may be at liberty to suggest additional conditions/ criteria based on the local hydro-geological situations which shall be reviewed by CGWA/Ministry of Jal Shakti, Government of India before acceptance.

All new/existing industries, industries seeking expansion, infrastructure projects and mining projects abstracting ground water, unless specifically exempted under Para 1.0 below, will be required to seek No Objection Certificate from Central Ground Water Authority or, the concerned State/ UT Ground Water

Authority as the case may be. The entire process of grant of No Objection Certificate shall be online through a web based application system.

Water management plans shall be prepared by all the State Ground Water Authorities/ Organizations for all Over-exploited, Critical and Semi-critical assessment units starting with Over-exploited units. Water management plans shall be reviewed and updated periodically. Water management plans, data on water availability and scarcity and policy framed in this regard shall be placed on the websites of Central Ground Water Authority/ State Ground Water Authority.

1.0 Exemptions from seeking No Objection Certificate:

Following categories of consumers shall be exempted from seeking No Objection Certificate for ground water extraction:

(i) Individual domestic consumers in both rural and urban areas for drinking water and domestic uses.

(ii) Rural drinking water supply schemes.

(iii) Armed Forces Establishments and Central Armed Police Forces establishments in both rural and urban areas.

(iv) Agricultural activities.

(v) Micro and small Enterprises drawing ground water less than 10 cum/day.

1.1 Registration of Drilling Rigs

State / Ut Governments shall be responsible for registering drilling rigs operating within their jurisdiction and for maintaining the database of wells drilled by them. Appropriate link shall be provided in CGWA portal for making the data available to CGWA.

2.0 Drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas

For grant of No Objection Certificate for ground water extraction, the project proponent has to furnish the details as per the guidelines issued by the CGWA in proper format as available in CGWA website. No Objection Certificate for new /existing wells shall be granted only in such cases where the local Government water supply agency is unable to supply requisite amount of water in the area.

No Objection Certificate shall be granted subject to the following specific conditions:

i) Installation of Sewage Treatment Plants shall be mandatory for all residential apartments/ Group Housing Societies where ground water requirement is more than 20 m^3/day. The water from Sewage Treatment Plants shall be utilized for toilet flushing, car washing, gardening etc.

ii) The No Objection Certificate shall be valid for a period of five years from the date of issue or till such time local Government water supply is provided to the project area, whichever is earlier. In case the project proponent receives water supply from the concerned local Government Water Supply Agency during the validity of the No Objection Certificate, intimation regarding availability of public water supply shall be sent by the project proponent to CGWA and No Objection Certificate will be cancelled by the Authority. In other cases, the project proponent will apply for renewal of No Objection Certificate, ninety days before the expiry of No Objection Certificate.

iii) Proponents shall be liable to pay ground water abstraction charges for the quantum of ground water proposed to be extracted, as per rates mentioned in Table 5.1.

Documents to be submitted with the application

a) Details of water requirement computed as per National Building Code, 2016 **(Annexure I)**, taking into account recycling/ reuse of treated water for flushing etc.

b) Affidavit on non-judicial stamp paper of Rs. 10/- by the applicant, confirming non/ inadequate availability of public water supply in case of users requiring ground water up to 10 m^3/ day for drinking/ domestic use.

c) Certificate of non-availability of water from local government water supply agency in cases requiring ground water in excess of 10 m^3/ day for drinking/ domestic use. Government water supply agencies

applying for No Objection Certificate shall submit copy of government approval of the scheme/ project proposed to be implemented.

d) Ground water quality data of existing bore well/ tube well/ dug well from any National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratory or Govt. approved laboratory (in case of existing projects applying for no objection certificate)

e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

3.0 Agriculture Sector

Agriculture sector is the backbone of the Indian economy. As per Minor Irrigation Census 2013-14, 87.86% of wells are owned by marginal, small and semi-medium farmers having land holding up to 4 hectares (ha). Around 9.18 % of wells are owned by medium farmers having land holding 4 – 10 ha and 2.96% of the wells are owned by big farmers having land holding more than 10 ha.

Considering the number of ground water abstraction structures, regulation of ground water in agriculture sector through a 'command and control' strategy will prove to be an arduous task. Therefore, a participatory approach for sustainable ground water management would be more productive.

States/Uts are advised to review their free/subsidized electricity policy to farmers, bring suitable water pricing policy and may work further towards crop rotation/diversification/other initiatives to reduce over-dependence on groundwater.

Agriculture sector shall be exempted from obtaining No Objection Certificate for ground water extraction.

4.0 Commercial Use

No new major industries shall be granted No Objection Certificate in over-exploited assessment areas except as per the policy guidelines.

Availability of ground water resources shall be given due regard while considering applications for grant of No Objection Certificate for commercial use.

Commercial entities extracting ground water shall be required to submit online annual water audit report including an audit of water use as mentioned in the relevant sections. CGWA/ State Ground Water Authority (SGWA) shall publish all such audit reports online.

CGWA/ SGWAs shall engage independent agencies to verify the compliance of No Objection Certificate conditions periodically.

4.1 Industrial Use

In Over-exploited assessment units, No Objection Certificate shall not be granted for ground water abstraction to any new industry except those falling in the category of Micro, Small and Medium Enterprises (MSME). However, No Objection Certificate for drinking/ domestic use for work force, green belt use by these new industries shall be permitted. Expansion of existing industries involving increase in quantum of ground water abstraction in over-exploited assessment units shall not be permitted. No Objection Certificate shall not be granted to new packaged water industries in Overexploited areas, even if they belong to MSME category.

No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:

i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.

ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.

iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be

required to reduce their ground water use by at least 20% over the next three years through appropriate means.

iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in Section 15 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 15 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Detailed guidelines for design and construction of piezometers are given in **Annexure II**. Monthly water level data shall be submitted to the CGWA through the web portal.

v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.

vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.

vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution **(Annexure III).**

viii) All industries drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Tables 5.2 A and 5.3 A.

ix) All existing industries drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as applicable as per Tables 5.2 B and 5.3 B.

Documents to be submitted with the application

(a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day.

(b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the local government water supply agency in cases where requirement of ground water is more than 10 m^3/day.

(c) Ground water quality data of existing bore well/ tube well/ dug well from any NABL accredited laboratory or Govt. approved laboratory (in case of existing projects applying for No Objection Certificate)

(d) Water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.

(e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(f) **Impact Assessment report:** All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in **Annexure IV.**

4.2 Mining Projects

All existing as well as new mining projects will be required to obtain No Objection Certificate for ground water abstraction. Since mining projects are location specific, there will be no ban on grant of No Objection Certificate for abstraction of ground water for such projects in over-exploited assessment units.

No Objection Certificate for mining projects shall be granted subject to the following specific conditions:

i) It shall be mandatory for all the mining industries to ensure that water available from de-watering operations is properly treated and should be gainfully utilized for supply for irrigation, dust

suppression, mining process, recharge in downstream and for maintaining e-flows in the river system.

ii) Construction of observation well(s) (piezometers) along the periphery in the premises, for monthly ground water level monitoring, shall be mandatory for mines drawing/ proposing to draw more than 10 m^3/day of ground water. Depth and aquifer zone tapped in the piezometer shall be commensurate with that of pumping well/ wells.

iii) In addition, the proponent shall monitor ground water levels by establishing observation wells (piezometers) in the core and buffer zones as specified in the No Objection Certificate.

iv) In case of coal and other base metal mining the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

v) In addition to this, all mining units shall also monitor the water quality of mine seepage and mine discharge through NABL accredited/ Govt. approved laboratories and the same shall be submitted at the time of self compliance.

vi) All mining projects drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Tables 5.4 A.

vii) All mining projects drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as per Table 5.4 B.

Documents to be submitted with the application

(a) Mining plan approved by the concerned Govt. agency/ department.

(b) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(c) Comprehensive report prepared by accredited consultant on ground water conditions in both core and buffer zones of the mine, depth wise and year wise mine seepage calculations, impact assessment of mining and dewatering on ground water regime and its socio-economic impact, details of recycling, reuse and recharge, reduction of pumping with use of technology for mining and water management to minimize and mitigate the adverse impact on ground water, based on local conditions. Format for report is given in **Annexure V.**

4.3 **Infrastructure projects:**

Since infrastructure projects are location specific, grant of No Objection Certificate to such projects located in over-exploited assessment units shall not be banned. New infrastructure projects/ residential buildings may require dewatering during construction activity and/ or use ground water for construction. In both cases, applicants shall seek No Objection Certificate from CGWA before commencement of work. However, in over-exploited assessment units, use of ground water for construction activity shall be permitted only if no treated sewage water is available within 10 km radius of the site. New as well as existing Infrastructure projects shall also be required to seek No Objection Certificate for abstraction of ground water.

No 'No Objection Certificate' shall be granted for extraction of groundwater for Water Parks, Theme Parks and Amusement Parks in over-exploited assessment units.

Indicative list of Infrastructure projects is given in Annexure VI.

The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:

i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data through the web portal to CGWA/SGWA as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by CGWA/ SGWA.

ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3/day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

iii) For infrastructure dewatering/ construction activity, No Objection Certificate shall be valid for specific period as per the detailed proposal submitted by the project proponent.

iv) All infrastructure projects drawing ground water in safe, semi-critical and critical assessment units shall be required to pay ground water abstraction charges as applicable as per Table 5.3 A.

v) All infrastructure projects (new/ existing) drawing ground water in over-exploited assessment units shall be liable to pay ground water restoration charges as per Table 5.3 B.

Documents to be submitted with the application

(a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.

(b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.

(c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in critical and over-exploited areas.

(d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.

(e) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.

(f) Details of water requirement computed as per National Building Code, 2016 **(Annexure I)**, taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).

(g) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.

5.0 Ground water abstraction/ restoration charges

All residential apartments/ group housing societies/ Government water supply agencies in urban areas shall be required to pay ground water abstraction charges.

All industries/mining/ infrastructure projects drawing ground water in safe, semi-critical and critical assessment units will have to pay ground water abstraction charges based on quantum of ground water extraction and category of assessment unit as per details given in this guideline.

All existing mining/ infrastructure projects and existing industries including MSME drawing ground water in over-exploited assessment units will have to pay ground water restoration charges based on quantum of ground water extraction. Further, new MSME, new infrastructure and new Mining projects in over exploited areas shall also be required to pay ground water restoration charges.

Existing industries, infrastructure units and mining projects which have installed/constructed artificial recharge structures in compliance of the conditions prescribed in the groundwater guidelines prevailing at the time of grant of No Objection Certificate or its renewal shall be eligible for a rebate of 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, subject to their satisfactory performance and verification.

The revenue generated from the proposed water abstraction/ restoration charges shall be kept in a separate fund for implementation of site specific suitable demand/ supply side interventions.

5.1 **Rates of Ground water abstraction /restoration charges**

I. **Drinking and domestic use for residential apartments/ group housing societies/ Government water supply agencies in Urban areas**

All residential apartments/ Group Housing Societies requiring water only for drinking/domestic use requiring No Objection Certificate would pay ground water abstraction charges as per rates given below in **Table 5.1.**

Table 5.1 Ground Water Abstraction charges for Drinking & Domestic use.

Quantum of Groundwater withdrawal (m^3/month)	**Rate of ground water abstraction charges (Rs. per m^3)**
0-25	No charge
26-50	1.00
>50	2.00

Government water supply agencies and Government infrastructure projects shall pay Ground water abstraction Charges @ Rs. 0.50 per m^3.

II. **Packaged Drinking Water units**

Rates of ground water abstraction charges for packaged drinking water units in safe, semi-critical and critical assessment units are given in Table 5.2 A and those for ground water restoration charges in over-exploited assessment units are given in Table 5.2 B.

Table 5.2 A: Rates of ground water abstraction charges for packaged drinking water units (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal				
		Up to 50m^3/day	51 to <200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	3.00	5.00	8.00	10.00
2.	Semi-critical	2.00	5.00	10.00	15.00	20.00
3.	Critical	4.00	10.00	20.00	40.00	60.00

Table 5.2 B: Rates of ground water restoration charges for packaged drinking water units (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal				
		Up to 50 m^3/day	51 to <200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited (existing industries only)	8.00	20.00	40.00	80.00	120.00

III. **Other Industries & infrastructure projects**

Rates of ground water abstraction charges for other industries and infrastructure projects in safe, semi-critical and critical assessment units are given in Table 5.3 A and those for ground water restoration charges in over-exploited assessment units are given in Table 5.3 B.

Table 5.3 A: Rates of Ground Water abstraction charges for other industries & infrastructure projects (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	2.00	3.00	5.00
2.	Semi-critical	2.00	3.00	5.00	8.00
3.	Critical	4.00	6.00	8.00	10.00

Table 5.3 B: Rates of ground water restoration charges for other industries & infrastructure projects (Rs per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited (existing industries / new Industries as per the present Guidelines)	6.00	10.00	16.00	20.00

IV. **Mining projects**

Rates of ground water abstraction charges for mining, which are drawing ground water in safe, semi-critical and critical assessment units are given in Table 5.4 A and those for ground water restoration charges in case of projects drawing ground water in over-exploited assessment units are given in Table 5.4 B.

Table 5.4 A: Rates of ground water abstraction charges for mining (Rs. per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	1.00	2.00	2.50	3.00
2.	Semi-critical	2.00	2.50	3.00	4.00
3.	Critical	3.00	4.00	5.00	6.00

Table 5.4 B: Rates of ground water restoration charges for mining (Rs. per m^3)

S.No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 200 m^3/day	200 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Over-exploited	4.00	5.00	6.00	7.00

6.0 Bulk Water Supply

All private tankers abstracting ground water and use it for supply as bulk water suppliers will now mandatorily seek No Objection Certificate for ground water abstraction. The bulk water suppliers through tankers drawing ground water in safe, semi-critical and critical assessment units shall pay groundwater abstraction charges as per the **Table-6.1 A.** The bulk water suppliers drawing ground water in over-exploited assessment units shall pay the groundwater restoration charges as per the **Table-6.1 B.** All tankers will have to install GPS based system for their monitoring of movement/area of operation.

Modalities for issue of No Objection Certificate for bulk/tanker water supplies shall be worked out in consultation with States/Uts and suitable guidelines in this regard will be framed and issued separately for the same.

Table-6.1A: Groundwater abstraction charges for Bulk/Tanker water supplies	
Category	Rate per m3 (in Rs.)
Safe	**10**
Semi Critical	**20**
Critical	**25**

Table-6.1B: Groundwater abstraction charges for Bulk/Tanker water supplies	
Category	Rate per m3 (in Rs.)
Over Exploited	**35**

7.0 Abstraction of Saline ground water

Abstraction of saline ground water in areas having either saline ground water at all depths or pockets of saline ground water in an otherwise fresh water area for use by industries/ dewatering by infrastructure/ mining projects including those located in over-exploited areas would be encouraged. Such industries shall be exempted from paying ground water abstraction charges.

The list of such assessment units having saline ground water at all depths as per the latest assessment of dynamic ground water resources will be made available by the CGWA in their website. However, due care shall be taken in respect of disposal of effluents by the units so as to protect the water bodies and the aquifers from pollution.

Detailed guidelines in this regard shall be prepared and issued separately.

8.0 Protection of Wetland Areas

The wet land areas in the country are very crucial as they are direct reflection of the presence of ground water in such areas. The protection of the wetland areas is being separately handled by the Wetland Authorities. Since ground water is very crucial for the survival of the wetland area, any excessive ground water development within the zone of wetland area would affect the volume of water in that wetland.

Projects falling within 500 m. from the periphery of demarcated wetland areas shall mandatorily submit a detailed proposal indicating that any ground water abstraction by the project proponent does not affect the protected wetland areas. Furthermore, before seeking permission from CGWA, the projects shall take consent/approval from the appropriate Wetland Authorities to establish their projects in the area.

9.0 General compliance conditions in No Objection Certificate

i. Installation of digital water flow meter (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate through the web-portal.

ii. Proponents shall mandatorily get water flow meter calibrated on from an authorized agency once in a year.

iii. Proponents shall install roof top rain water harvesting & recharge systems in the project area.

iv. Proponents shall pay Ground Water Abstraction/ Restoration Charges based on quantum of ground water extraction as applicable as per the rates given in Section 6.

v. Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 15. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in **Annexure-II.**

vi. Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

vii. If the existing well becomes defunct due to mechanical failure within the validity period of No Objection Certificate, the user can construct a replacement well under intimation to CGWA on web portal. The defunct well shall be properly sealed **(Refer Annexure VII).** The user will be required to submit documentary proof in this regard. However, if the existing abstraction structures fails to yield water and he proponent desires to drill another tubewell in the same premises, prior permission of the Authority shall be required. If the replacement well is to be drilled in some different place, the proponent shall obtain fresh No Objection Certificate.

viii. Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

ix. In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

10.0 Monitoring of compliance of No Objection Certificate Conditions

To monitor the compliance of No Objection Certificate conditions, Central Ground Water Authority and State/ UT Ground Water Authorities shall take the following steps:

a. Suitable MIS will be developed for compliance monitoring.

b. District Collectors/Deputy Commissioners (DCs) /District Magistrates (DMs) are authorized to take enforcement measures like sealing of unauthorized ground water abstraction structures, disconnection of electricity, launching of prosecution against those violating the No Objection Certificate conditions and taking action for imposition of Environmental Compensation.

c. Technical officers of CGWB/ CGWA and State groundwater organizations are authorized to take actions with respect to monitoring and periodic inspections with the approval of competent authority.

d. In case of violation of any of the No Objection Certificate conditions, the proponents shall be liable to pay the penalties as per **Section 16.**

11.0 Renewal of No Objection Certificate

No objection certificate shall be renewed periodically, subject to the compliance of the conditions mentioned therein:

i. The applicant shall apply for renewal of No Objection Certificate at least ninety days prior to expiry of its validity.

ii. Application for renewal of No Objection Certificate shall be accompanied by the Compliance Report.

iii. Before granting renewal, Central Ground Water Authority or State/ Ut Authority shall satisfy itself that the conditions of No Objection Certificate have been complied with.

iv. In case of change in category of the assessment unit, renewals would be granted with conditions as laid down for new category.

v. No Objection Certificate will be renewed for the terms specified for various uses as follows:

Category	Use	Term of renewal
Critical, Semi-critical and safe	Infrastructure projects for drinking & domestic use and urban Water Supply Agencies	5 years
	Industries	3 years
	Mines	2 years
Over exploited	All users in 'Over-exploited areas'	2 years

vi. If the application for renewal is submitted in time and the CGWA/ the respective State/ Ut Authority is unable to process the application in time, No Objection Certificate shall be deemed to be extended till the date of renewal of No Objection Certificate.

vii. If the proponent fails to apply for renewal within 3 months from the date of expiry of No Objection Certificate, the proponent shall be liable to pay Environmental Compensation for the period starting from the date of expiry of No Objection Certificate till No Objection Certificate is renewed by the competent authority.

12.0 Extension of No Objection Certificate

If the proponent is unable to construct the well(s) during the validity period of No Objection Certificate for genuine reasons, the proponent will have to apply for extension of No Objection Certificate. Application for extension should be supported by documents justifying the reasons for delay. Other conditions for grant of extension of No Objection Certificate will be the same as that for fresh No Objection Certificate.

Extension of No Objection Certificate will be granted for a maximum period of two years. No further extension will be granted after the expiry of the extended period. In that case, the applicant will have to apply afresh for grant of No Objection Certificate.

13.0 Delegation of powers against illegal groundwater withdrawal

Central Ground Water Authority has appointed the District Magistrate/ District Collector/ Sub Divisional Magistrates of each Revenue District/Sub division as Authorized Officers, who have been delegated the power to seal illegal wells, disconnect electricity supply to the energised well, launch prosecution against offenders etc. including grievance redressal related to ground water in their respective jurisdictions.

In order to further decentralise and strengthen the monitoring and compliance mechanism as per the guidelines, officials of concerned Departments of Revenue and Industries of the States/Uts shall be appointed as Authorised Officers in consultation with the State/Ut Governments.

A copy of the No Objection Certificate issued by the CGWA in the No Objection Certificate Application Portal (NOCAP) will be forwarded to the respective District Magistrate/ District Collector. In case of any violation of the directions of Central Ground Water Authority and non-fulfilment of the conditions laid

down in the No Objection Certificate, the Authorised Officers will file appropriate Petition/Original Application etc under sections 15 to 21 of the Environment (Protection) Act, 1986 in appropriate Courts.

14.0 Ground Water Level Monitoring

All the project proponents (drawing ground water more than 10 cum/d) have to mandatorily construct Piezometers (observation wells) within their premises for monitoring of the ground water levels. Such a mechanism of compliance conditions has been made to ensure that every month the ground water level in the project area can be monitored and observed. In this regard the necessary criteria for monitoring of water levels through piezometers by the project proponents is given in Table 14.1.

Table 14.1 No. of Piezometers to be constructed & Type of Water Level Monitoring Mechanism

S.No.	Quantum of Ground water withdrawal (cum/d)	No. of piezometer required	Monitoring mechanism		
			Manual	DWLR	DWLR with Telemetry
1	<10	0	0	0	0
2	11-50	1	1	0	0
3	51-500	1	0	1	0
4	>500	2	0	1	1

The piezometer shall be suitably located to ensure that zone of aquifer tapped in the piezometer is the same as that of the pumping well.

15.0 Environmental Compensation

Extraction of ground water for commercial use by industries, infrastructure units and mining projects without a valid No Objection Certificate from appropriate authority shall be considered illegal and such entities shall be liable to pay Environmental Compensation for the quantum of ground water so extracted. The norms prescribed by Central Pollution Control Board (CPCB) shall be utilized for calculating the Environmental compensation as mentioned below:

EC_{GW} = Ground water consumption per day x Environmental Compensation rate (ECR_{GW}) x No. of days x Deterrence factor

where ground water consumption is in m3/day and ECR_{GW} in Rs./ cum

15.1 Rates of Environmental Compensation:

Rates of Environmental Compensation (ECR_{GW}) for various types of users in different categories of assessment units are given in Table 15.1 to 15.3.

Table 15.1 : ECR_{GW} for Packaged Drinking Water units

S.No.	Area Category	Water Consumption (cum/day)			
		<200/	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
	Safe	12	18	24	30
2	Semi critical	24	36	48	60
3	Critical	36	48	66	90
4	Over- exploited	48	72	96	120
Note :-Minimum EC_{GW} shall not be less than Rs 1,00,000/-					

Table 15.2: ECR_{GW} for Mining/ infrastructure dewatering projects

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
1	Safe	15	21	30	40
2	Semi critical	30	45	60	75
3	Critical	45	60	85	115
4	Over- exploited	60	90	120	150
Note :-Minimum EC_{Gw} shall not be less thanRs 1,00,000/-					

Table 15.3: ECR_{GW} for Industrial units

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m3			
1	Safe	20	30	40	50
2	Semi critical	40	60	80	100
3	Critical	60	80	110	150
4	Over- exploited	80	120	160	200
Note :-Minimum EC_{Gw} shall not be less thanRs 1,00,000/-					

15.2 Deterrent Factors to compensate losses and environmental damage (for packaged drinking water units, mining, industries and infrastructural dewatering projects)

The following deterrent factors based on the duration of illegal ground water extraction shall be levied to compensate for the losses and environmental damages as detailed in Table 15.4.

Table 15.4: Deterrent factor based on quantum of ground water withdrawal and number of years of illegal withdrawal

S.No.	Water Consumption	Deterrence Factor		
		< 2 years	2-5 years	>5 years
1	<1000 KLD	1.00	1.00	1.25
2	1000-5000 KLD	1.00	1.00	1.50
3	>5000 KLD	1.00	1.25	2.00

Note: KLD – Kilolitre per day

16.0 Provision of Penalty

Penalty shall be imposed on the proponents for non-compliance of No Objection Certificate conditions issued by the appropriate authority. Rates of penalty proposed for non-compliance of various conditions of No Objection Certificate are given in Table 16.1.The rates of the penalty shall be reviewed periodically with the approval of competent authority in Ministry of Jal Shakti.

Table 16.1: Penalty provision for non Compliance of No Objection Certificate conditions

S. No.	**Items**	Charges in Rs.
1	Non installation/faulty Digital water Flow meter with telemetry system.	200000
2	Non disclosure/ construction of additional groundwater abstraction structures a) Non-functional Structures. b) Defunct/Abandoned Note: Given rates are for unit non-functional/defunct/abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty.	 200000 100000
3	Reporting of fresh water zones as Brackish / Saline zones in application.	200000
4	Non Installation of Piezometer.	200000
5	Non Installation/faulty DWLR/Telemetry system	100000
6	Non Construction/Inadequate capacity of Recharge / Water conservation structures.	500000
7	Non maintenance of Recharge structures.	200000
8	Injection of treated/untreated water into the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquifer remediation as per the provisions of Environment (Protection) Act, 1986.	1000000
9	Non Submission of Water level/Water quality Data.	50000
10	Non-maintenance of log book of daily withdrawal/non submission of Groundwater abstraction data.	50000
11	Non submission of photograph of recharge structure(s).	50000
12	Non Submission of Self Compliance report.	100000
13	Construction of groundwater abstraction structures by un authorized/unregistered Drilling Rigs (per structures).	100000
14	Non registration of water supply tankers.	500000
15	Submission of false information/ undertaking.	100000

Charges shall also be payable for correction/modification in the existing issued No Objection Certificate letter. The details of such charges are given in Table 16.2.

Table 16.2: Proposed Charges for correction/Modification in the existing issued No Objection Certificate

S. No.	**Items**	Charges in Rs.
1	Change in recharge quantum	10000
2	Change in User ID.	5000
3	Change in firm Name	5000
4	Extension of No Objection Certificate	5000
5	Issuance of duplicate No Objection Certificate	5000
6	Issuance of corrigendum to No Objection Certificate	5000
7	Any other items/corrections etc	5000

17.0 Other important Conditions (Applicable to all):

i. Sale of ground water by a person/ agency not having valid no objection certificatefrom CGWA/State Ground Water Authority is not permitted.

ii. In infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

iii. In case of Infrastructure projects, the firm/entity shall ensure implementation of dual water supply system in the projects. Compliance of the same shall be submitted through the web portal.

iv. Non-compliance of conditions mentioned in the No Objection Certificate may be taken as sufficient reason for cancellation of no objection certificate accorded/ non-renewal of No Objection Certificate.

v. No application shall be entertained without supporting documents as specified in relevant sections.

vi. Abstraction structure(s) should be located inside the premises of project property.

vii. Self compliance of conditions laid down in the no objection certificate shall be reported by the users online in the web portal of Central Ground Water Authority/state Ground Water Authority.

viii. Processing fee prescribed, if any, from time to time shall be charged for various services.

Note:

1. Guidelines are subject to modification from time to time.

2. In case of any discrepancy between Hindi and English versions of this document including the annexures, the English version shall prevail.

Annexure I

Estimation of Water Requirements for drinking and domestic use

(Source: National Building Code 2016, BIS)

a) Residential Buildings:

Accommodations	Population
1 Bedroom dwelling unit	4
2 Bedroom dwelling unit	5
3 Bedroom dwelling unit	6
4 Bedroom dwelling unit and above	7

Notes:

1) The above figures consider a domestic household including support personnel, wherever applicable.

2) For plotted development, the population may be arrived at after due consideration of the expected number and type of domestic household units.

3) Dwelling unit under EWS category shall have population requirement of 4 and studio apartment shall have population requirement of 2.

As a general rule the following rates per capita per day may be considered for domestic and non-domestic needs:

a) For communities with populations up to 20,000:

1)	Water supply through stand post:	40 lphd (Min)
2)	Water supply through house service: connection	70 to 100 lphd

b) For communities with: 100 to 135 lphd
population 20,000 to 100,00 together with
full flushing system

c) For communities with population: 150 to 200 lphd
above 100,000 together with
full flushing system

Note—The value of water supply given as 150 to 200 litre per head per day may be reduced to 135 litre per head per day for houses for Medium Income Group (MIG) and Low Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions and availability of water.

Out of the 150 to 200 litre per head per day, 45 litre per head per day may be taken for flushing requirements and the remaining quantity for other domestic purposes.

A. **Water Requirements for Buildings Other than Residences**

Sl No.	Type of Building	Domestic litres per head/ day	Flushing Litres per head/ day	Total Consumption Litres per head/ day
1.	Factories including canteen where bath rooms are required to be provided	30	15	45
2.	Factories including canteen where no bath rooms are required to be provided	20	10	30
3.	Hospital (excluding laundry and kitchen): a) Number of beds not exceeding 100	230	110	340
	b) Number of beds exceeding 100	300	150	450
	c) Out Patient Department (OPD)	10	5	15
4.	Nurses' homes and medical quarters	90	45	135
5.	Hostels	90	45	135
6.	Hotels (up to 3 star) excluding laundry, kitchen, staff and water bodies	120	60	180
7.	Hotels (4 star and above) excluding laundry, kitchen, staff and water bodies	260	60	320
8.	Offices (including canteen)	25	20	45
9.	Restaurants and food court including water requirement for kitchen: a) Restaurants	55 per seat	15 per seat	70 per seat
	b) Food Court	25 per seat	10 per seat	35 per seat
10.	Clubhouse	25	20	45
11.	Stadiums	4	6	10

12.	Cinemas, concert halls and theatres and multiplex	5 per seat	10 per seat	15 per seat
13.	Schools/Educational institutions: a) Without boarding facilities b) With boarding facilities	25	20	45
		90	45	135
14.	Shopping and retail (mall) a) Staff	25	20	45
	b) Visitors	5	10	15
15.	Traffic Terminal stations a) Airports	40	30	70
	b) Railway stations (Junction) with bathing facility	40	30	70
	c) Railway stations (Junction) without bathing facility	30	15	45
	d) Railway stations (Intermediate) with bathing facility	25	20	45
	e) Railway stations (Intermediate) without bathing facility	15	10	25
	f) Interstate bus terminals	25	20	45
	g) Intrastate Bus Terminals/Metro Stations	10	5	15

Notes:

1. For calculating water demand for visitors, consumption of 15 litre per head per day may be taken.
2. The water demand includes requirement of patients, attendants, visitors and staff. Additional water demand for kitchen, laundry and clinical water shall be computed as per actual requirements.
3. The number of persons shall be determined by average number of passengers handled by stations, with due considerations given to the staff and vendors who are using these facilities.
4. Consideration should be given for seasonal average peak requirements.
5. The hospitals may be categorized as Category A (25 to 50 beds), Category B(51 to 100 beds), Category C (101 to 300 beds), Category D (301 to 500) and Category E (501 to 750 beds).

Annexure II

Guidelines for construction of Piezometers and monitoring of Ground Water Levels and Quality

Piezometer is a borewell/tubewell used only for measuring the water level by lowering a tape/sounder or automatic / digital water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum distance of 50 m from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about four inches to six inches.
- The depth of the piezometer should be the same as that of the pumping well from which ground water is being abstracted. If, more than one pumping wells are constructed tapping aquifers at different depths, more than one piezometers shall be required to be constructed tapping different aquifers as in the pumping wells.

- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tubewells has been stopped for about four to six hours.

- The ground water quality has to be monitored once in a year during pre-monsoon (April/ May) period by industries and mines drawing ground water. Samples of ground water should be analyzed from NABL accredited laboratory.

- A permanent display board should be installed at Piezometer/ Tubewell site for providing the location, piezometer/ tubewell number, depth and zone tapped of piezometer/tubewell for standard referencing and identification.

- Any other site specific requirement regarding safety and access for measurement may be taken care off.

Annexure III

Measures to be adopted to ensure prevention from pollution in the plant premises of polluting industries/ projects

It has been observed that ground water in and around polluting industries like Tannery, Slaughter Houses, Dye, Chemical, Coalwashery, other hazardous units, etc., is polluted. In order to prevent further deterioration of ground water quality, it is essential to take all necessary measures for well head protection. All industries/ projects falling under this category are hereby directed to follow the under mentioned procedure both for existing and new category.

1. No tube well/ bore well / dug well should be constructed in the vicinity of the processing unit. Tube well/ bore well should be constructed at the place which is hygienically maintained.

2. Only Mild Steel pipe should be used for assembly/ casing and PVC (Poly Vinyl Chloride) or similar pipes should not be used. The tube well/ bore well having PVC or similar pipes should be abandoned and filled back.

3. Around the tube well/ bore well, RCC (Reinforced Concrete Cement) grouting of 3 meters (length) x 3 meters (width) x 2 meters (depth) must be provided. The pipe of the tube well/ bore well must be raised 1 meter above ground level (1 magl). The tube well/ bore well must be surrounded by RCC wall of 0.5 meter height and 1.5 meter depth to prevent any surface contamination to enter the constructed tube well/ bore well. Plan/Sectional diagram is enclosed for reference (Appendix 1 and 2).

3. The tube well/ bore well must be fitted with NRV (Non Return Valve) in order to ensure that the constructed tube well/ bore well is exclusively used for abstraction of ground water only.

4. At no point of time there should be any injection of any water or fluid into the constructed tube well/ bore well/ Piezometer.

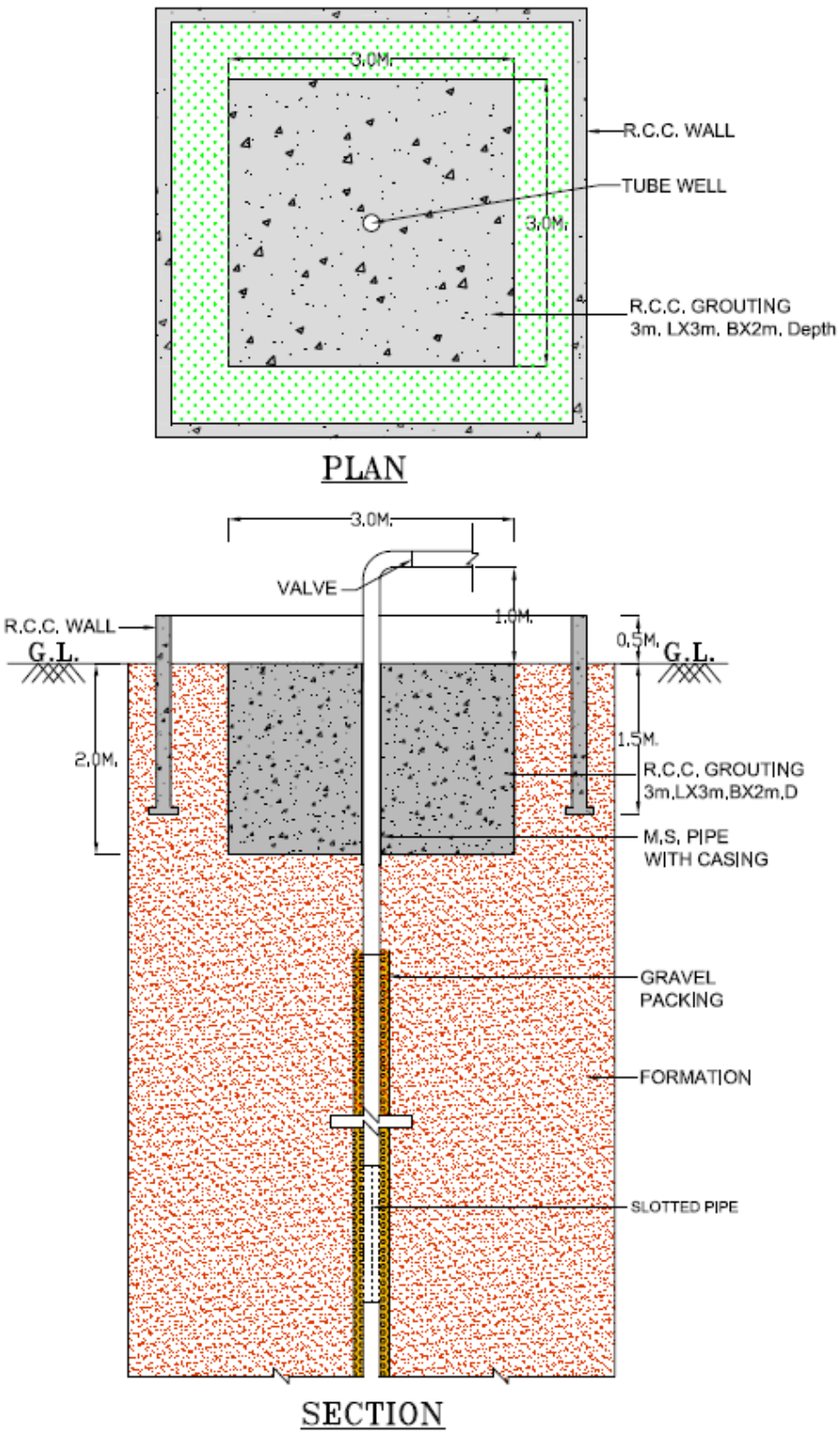
5. The industries/ projects under this category should not implement any recharge measures within the plant premises.

6. Any tube well/ bore well located/ constructed in the vicinity of STP (Sewage Treatment Plant) or ETP (Effluent Treatment Plant) should be abandoned and filled back.

7. The piezometer to be constructed for monitoring purpose should follow the same procedure as that for tube well/ bore well for such industries/ projects.

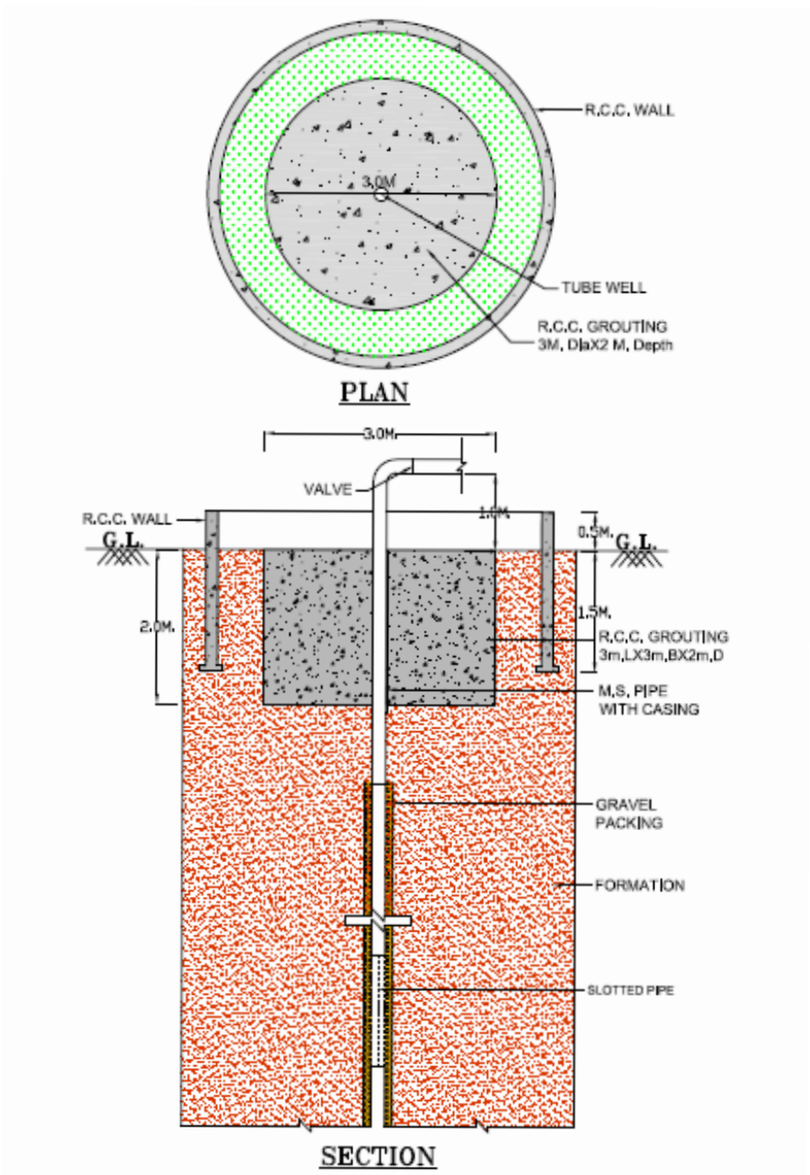
Appendix 1

Plan/ Sectional diagram showing well head protection



Appendix 2

Plan/ Sectional diagram showing well head protection



Annexure-IV

Outline of hydro-geological Report for obtaining No Objection Certificate for industries

1. Brief about the proposed project giving location details, coordinates, google/ toposheet maps, etc. demarcating the project area.

2. Ground water situation in and around the project area including water level and quality data and maps along with quality issues, if any. In case of mines, ground water conditions in both core and buffer zone should be described.

3. Details of the tubewells/ borewells proposed to be constructed. This includes the drilling depth, diameter, tentative lithological log, details of pump to be lowered, H.P. of pump, tentative discharge of tubewells/ borewells, etc. Locations to be marked on the site plan/ map. Location of proposed piezometers.

4. Details of Geophysical studies carried out in and around the project area. Ground water resources computation of the block in which the project falls.

5. Approved Mine plan in case of mines and detailed dewatering plan in case of mine/ infrastructure dewatering projects.

6. Proposed usage of pumped water in case of mining/ infrastructure dewatering projects.

7. Comprehensive assessment of the impact on the ground water regime in and around the project area highlighting the risks and proposed management strategies proposed to overcome any significant environmental issues.

8. Proposed measures for disposal of waste water by industries drawing saline water.

9. Measures to be adopted for water conservation which include recycling, reuse, treatment, etc. This includes the water balance chart being adopted by the firm along with details of water conservation methods to be adopted.

- Brief write up along with capacity and flow chart of Sewage Treatment Plants / Effluent Treatment Plants / Combined Effluent Treatment Plants existing/ proposed within the project.
- Details of water conservation measures to be adopted to reduce/ save the ground water.
- Total water balance chart showing the usage of water for various processes.

10. Any other details pertaining to the project.

Annexure V

Format of the Report on ground water conditions (for mining projects)

Introduction

Project description

Background

Objectives and scope

Regional setting

Location

Landuse

Climate

Topography and drainage

Geology –Regional and Local

General Hydrogeology (aquifer types, aquifer depth, zone tapped etc.)

Groundwater condition (In core and buffer zones)

Spatial and temporal variations in water levels Groundwater quality (Shallow and deep aquifer)

Impact of groundwater extraction on local groundwater

Hydrograph of water level/piezometer in monitoring wells

Trend analysis of historical water levels Flow net analysis (groundwater flow direction)

Year wise/ bench wise mine dewatering computation as per approved mine plan

Conclusions

Annexure VI

Indicative list of Infrastructure projects

Residential townships including commercial buildings
Office building
School
College
University
Special Economic Zone
Metro Station
Railway Station
Bus Depot
Airport
Seaport
Highway infrastructure
Fire station
Warehouse
Business Plaza
Malls & Multiplex
Hospitals
Nursing Homes
Resort
Hotel/ Restaurant/ Food Plaza
Holiday home/Guest house/ Hostels
Banquet Hall/ Marriage Gardens
IT Complex
Logistics & Cargo
Clubs
Trade Centre

Annexure -VII

Supreme Court Order in Civil Writ petition 36 of 2009 regarding measures for prevention of fatal accidents of small children due to their falling into abandoned bore wells and tube wells

In Re: Measures for prevention of fatal accidents of small children due to their falling into abandoned bore wells and tube wells

Union of India and Ors. Respondents(s)

ORDER

With this Court issuing requisite guidelines vide order dated 11th February, 2010, subject to slight modifications, nothing survives in the present writ petition.

That modification is as follows:

(i) The owner of the land/ premises, before taking any steps for constructing bore well/ tube well must inform in writing to the concerned authorities in the area, i.e., District Collector/ District Magistrate/ Sarpanch of the Gram Panchayat/ any other Statutory Authority/ concerned officers of the Department of Ground Water/ Public Health/ Municipal Corporation, as the case may be, about the construction of bore well/ tube well.

(ii) Registration of all the drilling agencies, namely, Government/ Semi Government, Private etc. should be mandatory with the district administration/ Statutory Authority wherever applicable.

(iii) Erection of signboard at the time of construction near the well with the following details:-

(a) Complete address of the drilling agency at the time of construction/ rehabilitation of well.

(b) Complete address of the user agency/owner of the well.

(iv) Erection of barbed wire fencing or any other suitable barrier around the well during construction.

(v) Construction of cement/ concrete platform measuring 0.50x0.50x0.60 meter (0.30 meter above ground level and 0.30 meter below ground level) around the well casing.

(vi) Capping of well assembly by welding steel plate or by providing a strong cap to be fixed to the casing pipe with bolts & nuts.

(vii) In case of pump repair, the tube well should not be left uncovered.

(viii) Filling of mud pits and channels after completion of works.

(ix) Filling up abandoned bore wells by clay/sand/boulders/pebbles/drill cuttings etc. from bottom to ground level.

(x) On completion of the drilling operations at a particular location, the ground conditions are to be restored as before the start of drilling.

(xi) District Collector should be empowered to verify that the above guidelines are being followed and proper monitoring check about the status of bore holes/ tube wells are being taken care through the concerned state/ Central Government agencies.

(xii) District/ Block/ Village wise status of bore wells/tube wells drilled viz. No. of wells in use, No. of abandoned bore wells/ tube wells found open, No. of abandoned bore wells/ tube wells properly filled up to ground level and balance number of abandoned bore wells/ tube wells to be filled up to ground level is to be maintained at District Level.

In rural areas, the monitoring of the above is to be done through Village Sarpanch and the Executive from the Agriculture Department.

In case of urban areas, the monitoring of the above is to be done through Junior Engineer and the Executive from the concerned Department of Ground Water/Public Health/ Municipal Corporation etc.

(xiii) If a bore well/ tube well is 'Abandoned' at any stage, a certificate from the concerned department of Ground Water/ Public Health/ Municipal Corporation/ Private Contractor etc. must be obtained by the aforesaid agencies that the 'Abandoned' bore well/tube well is properly filled upto the ground level. Random inspection of the abandoned wells is also to be done by the Executive of the concerned agency/ department. Information on all such data on the above are to b maintained in the District Collector/ Block Development Office of the State.

We are informed that the last paragraph of the earlier order dated 11th February, 2010, concerning publicity has been duly complied with.

Subject to the above, the writ petition is disposed of.

……..CJI.
[S.H. KAPADIA]

……..….J.
[K.S. RADHAKRISHNANA]

……..…….J.
[SWATANTER KUMAR]

New Delhi,
August 6, 2010

ANNEXURE VIII

List of States/Union territories where ground water extraction is being regulated by Central Ground Water Authority

1. Andaman and Nicobar Islands
2. Assam
3. Arunachal Pradesh
4. Bihar
5. Chhattisgarh
6. Dadra and Nagar Haveli and Daman and Diu
7. Gujarat
8. Haryana
9. Jharkhand
10. Madhya Pradesh
11. Maharashtra
12. Manipur
13. Meghalaya
14. Mizoram
15. Nagaland
16. Odisha
17. Punjab
18. Rajasthan
19. Sikkim
20. Tripura
21. Uttar Pradesh
22. Uttarakhand
23. Andhra Pradesh (only mining projects)
24. Telangana (only mining projects)

Annexure IX

Glossary of technical terms used

1. **Safe area**: Area categorized as SAFE from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organizations. Details available on the websites of NOCAP and CGWB.
2. **Semi-critical area**: Area categorized as SEMI-CRITICAL from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organizations. Details available on the websites of NOCAP and CGWB.
3. **Critical area**: Area categorized as CRITICAL from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organisations. Details available on the websites of NOCAP and CGWB.
4. **Over-exploited area**: Area categorized as OVER-EXPLOITED from the ground water resources point of view, based on the latest ground water resources assessment carried out jointly by CGWB and State ground water organisations. Details available on the websites of NOCAP and CGWB.
5. **Aquifer**: Geological formation capable of storing and transmitting ground water.
6. **Deeper Aquifer**: In areas having multiple aquifer system, the aquifer(s) occurring below the uppermost aquifer.
7. **Well**: Any structure used for the extraction of groundwater, including open wells, dug wells, bore wells, dug-cum-bore wells, tube wells, filter points, collector wells, infiltration galleries, recharge wells, or any of their combinations or variations.
8. **Government Agency**: May be Central or State Government body.
9. **Supplier**: Government/ Government approved Water Supply Agency.
10. **Mine**: Area where mining activity is taking place, or area abandoned after mining.
11. **Illegal Ground Water abstraction Structure**: Any energized abstraction structure viz. dugwell, tubewell, borewell which is being used to withdraw ground water without valid No Objection Certificate from Central Ground Water Authority.
12. **Rainwater Harvesting**: The technique or system of collection and storage of rainwater, at micro watershed scale, including roof-top harvesting, for future use or for recharge of groundwater.
13. **Mining Project**: Project which involves mining activity either open cast or underground or both.
14. **Ground Water Draft**: Quantum of ground water withdrawal.
15. **Saline Water**: Water having salinity in excess of 2500 µsiemens/cm at 25^0C.
16. **Water Table Intersection**: Intersection of the water table on excavation of the overlying material due to mining or other activities.
17. **Drinking and domestic use**: Besides drinking & domestic use of households, this category will cover drinking requirement of industries not requiring water for industrial process; drinking, washing, cleaning use etc. in case of hospitals, hotels, malls & multiplexes, institutions, offices, banquet halls, fire stations, metro stations, railway stations, airports, sea ports, stadia etc.
18. **Recycle/Reuse**: Using treated waste water for various purposes/ putting water to multiple uses.
19. **Government Department:** Either Central Government or State Government.
20. **Municipality:** Municipality, a Municipal Corporation or similar body of local urban governance by any other name.
21. **Groundwater:** Water, which exists below the surface in the zone of saturation and can be extracted through wells or any other means or emerges as springs and base flows in streams and rivers;
22. **Bgl :** Below Ground Level.
23. **BCM :** Billion cubic metres.

24. Groundwater Abstraction structure: Structure used to withdraw groundwater like bore well / tube well / dug well/dug cum bore well/tunnel well.

25. Observation well or Piezometer: A bore well/tube well used only for measuring the water level/piezometric head and to take water sample periodically but not used for groundwater abstraction.

26. Water Audit: A method of quantifying water use in simple or complex systems, with a view to reducing water usage and often saving money on otherwise unnecessary water use.

27. Ground water pollution: If concentration of any parameter in ground water exceeds the maximum permissible limit for drinking water prescribed by the Bureau of Indian Standards.

28. Cooperative Group Housing Societies/ Builder flats: A Housing Society is a society formed by house owners within a residential complex. The housing society formed must be formally registered with registrar of co-operatives.

29. KLD – Kilo Litre per day

30. $\mathbf{EC_{GW}}$ - Environmental compensation for drawing illegal ground water.

31. $\mathbf{EC_{GWR}}$ - Environmental compensation rates for drawing illegal ground water.

ANNEXURE X

Annual water audits by the industries (Source – CII)

Water audit is a systematic process of objectively obtaining a water balance by measuring flow of water from the site of water withdrawal or treatment, through the distribution system, and into areas where it is used and finally discharged. Conducting a water audit involves calculating water balance, water use and identifying ways for saving water.

Water audit involves preliminary water survey and detailed water audit. Preliminary water survey is conducted to collect background information regarding plant activities, water consumption and water discharge pattern and water billing, rates and water cess. After the analysis of the secondary data collected from the industry, detailed water audit is conducted, which involves the following steps:

- On site training and discussion with facility manager and personnel
- Water system analysis
- Quantification of baseline water map
- Monitoring and measurements using pressure and flow meters and various other devices
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use

A detailed water balance is finally developed. Water quality requirement at various user areas is mapped, which helps in developing ‘recycle’ and ‘reuse’ opportunities.

The detailed water audit report contains the following:

- Water consumption and wastewater generation pattern
- Specific water use and conservation
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Full description and figures
- Investment required

Industries can undertake following measures for water conservation:

- Setting up of norms for water budgeting
- Modernization of industrial process to reduce water consumption
- Recycling water with a re-circulating cooling system
- Ozonation cooling water approach which can result in five fold reduction in blow down when compared to traditional chemical treatment
- Reduction in reuse of de-ionized water by eliminating some plenum flushes, converting from a continuous flow to an intermittent flow system and improving control on the use
- Use of waste water for gardening
- Proper processing of effluents to adhere to the norms of disposal.

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ANNEXURE-R-8

रजिस्ट्री सं. डी.एल.- 33004/99

REGD. No. D. L.-33004/99

भारत का राजपत्र
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जल शक्ति मंत्रालय

(जल संसाधन, नदी विकास और गंगा संरक्षण विभाग)

(केंद्रीय भूमिजल प्राधिकरण)

अधिसूचना

नई दिल्ली, 29 मार्च, 2023

का.आ. 1509(अ).—पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 5 के साथ पठित धारा 3 की उप-धारा (3) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए जल संसाधन, नदी विकास और गंगा संरक्षण विभाग एतद द्वारा भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में अधिसूचना संख्या एस.ओ. 3289 (अ) 24 सितंबर, 2020, में भूजल के निष्कर्षण को विनियमित और नियंत्रित करने के लिए प्रकाशित दिशानिर्देशों में निम्नलिखित संशोधन करता है अर्थात्:-

उक्त अधिसूचना में अनुसूची के लिए अनुसूची में निम्नलिखित परिवर्तनों को प्रतिस्थापित/जोड़ा जाएगा, अर्थात्:-

"अनुसूची

1.भारत में भूजल निकासी को विनियमित और नियंत्रित करने के लिए दिशानिर्देश, 2020 में-

(क) इंडेक्स में मद संख्या 16.0 में, "दंड का प्रावधान" शब्दों के लिए "एनओसी में सुधार/संशोधन के लिए दंड और शुल्क का प्रावधान" शब्दों को प्रतिस्थापित किया जाएगा|

(ख) इंडेक्स में, अनुलग्नक में, "अनुबंध VI: आधारभूत परियोजनाओं की सांकेतिक सूची", शब्दों के स्थान पर, "अनुबंध VI: स्थान विशिष्ट आधारभूत परियोजनाओं की सांकेतिक सूची" शब्दों को प्रतिस्थापित किया जाएगा।

(ग) इंडेक्स में, अनुलग्नक में, "अनुबंध X: उद्योगों द्वारा वार्षिक जल लेखा परीक्षा", शब्दों के स्थान पर, "अनुबंध X: उद्योगों द्वारा जल लेखा परीक्षा" शब्दों को, प्रतिस्थापित किया जाएगा।.

2. उक्त दिशानिर्देशों में पैरा 1.0 में, खंड (v) के बाद, खंड (vi), (vii) को जोड़ा जाएगा, अर्थात्: -

"(vi) सभी आकलन इकाइयों में केवल पीने/घरेलू प्रयोजनों के लिए 5 घन मीटर/दिन तक भूजल की निकासी करने वाले सभी उद्योग/खनन परियोजनाएं/अवसंरचना परियोजनाएं ।

(vii) आवासीय अपार्टमेंट और ग्रुप हाउसिंग सोसाइटी:

(क) दिशानिर्देशों के पैरा 2.0 में उल्लिखित शर्तों के अधीन पेय जल और घरेलू उपयोग के लिए 20 घन मीटर /दिन तक भूजल की निकासी ।

(ख) सरकारी योजनाओं के तहत आर्थिक रूप से कमजोर वर्गों (ईडब्ल्यूएस) के लिए आवास इकाइयां" ।

3.उक्त दिशा-निर्देशों के पैरा 2.0 में:-

(i).उप-पैरा 2 जोड़ा जाएगा अर्थात्:-

> " सभी आवासीय अपार्टमेंट और ग्रुप हाउसिंग सोसाइटी के लिए सभी निष्कर्षण संरचना (ओं) में डिजिटल जल प्रवाह मीटर (बीआईएस / आईएस मानकों के अनुरूप) की संस्थापना अनिवार्य होगी। ऐसे सभी आवासीय अपार्टमेंट और ग्रुप हाउसिंग सोसाइटी, जिनमे स्विमिंग पूल हैं और भूजल की निकासी की जा रही है,के लिए अनापत्ति प्रमाण पत्र प्राप्त करना अनिवार्य होगा।"

(ii). खंड (घ) के लिए निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्: -

"घ) खारे भूजल के निष्कर्षण के मामले में, किसी भी नेशनल अक्रेडीशन बोर्ड फॉर टेस्टिंग एंड कैलिब्रेशन लैबोरेटरी (एनएबीएल) से मान्यता प्राप्त प्रयोगशाला या सरकार द्वारा स्वीकृत प्रयोगशाला से मौजूदा बोरवेल / नलकूप / खोदे गए कुएं का भूजल गुणवत्ता डेटा।

नोट: नई परियोजनाओं के मामले में खारे भूजल की निकासी के लिए उपर्युक्त प्रयोगशालाओं से निकटवर्ती मौजूदा कुओं के जल की गुणवत्ता के आंकड़े/ की रिपोर्ट प्रस्तुत की जाए ।

(iii) खंड (ङ) के लिए निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"ङ) आवेदक द्वारा सरकारी एजेंसी को प्रस्तुत वर्षा जल संचयन योजना की प्रति अथवा आवास और शहरी मामलों के मंत्रालय, भारत सरकार द्वारा जारी मॉडल बिल्डिंग उपनियमों के अनुसार परियोजना परिसर में वर्षा जल संचयन/पुनर्भरण के लिए प्रस्ताव।".

(iv). पैरा 2.0 में, खंड (ङ) के बाद, एक और खंड (च) अंतःस्थापित / जोड़ा जाएगा, अर्थात्:-

"च) सभी नई परियोजनाओं के लिए, परियोजना के पूरा होने की तारीख के उल्लेख सहित एक स्वतः घोषणा/शपथ पत्र (विधिवत नोटरीकृत) अनिवार्य होगा ।"

4.पैरा 4.0 में उप पैरा 3 के स्थान पर निम्नलिखित उप पैरा प्रतिस्थापित किया जाएगा, अर्थात्:-

"भूजल का निष्कर्षण करने वाली वाणिज्यिक संस्थाओं को प्रासंगिक धाराओं में उल्लिखित अनुसार जल के उपयोग के लेखापरीक्षा सहित ऑनलाइन जल लेखापरीक्षा रिपोर्ट जमा करनी होगी। सीजीडब्ल्यूए/राज्य भूजल प्राधिकरण (एसजीडब्ल्यूए) ऐसी सभी ऑडिट रिपोर्ट को ऑनलाइन प्रकाशित करेगा।

5.पैरा 4.1 में:-

(i). खंड (iii) के स्थान पर निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(iii) 100 घनमीटर/दिन से अधिक भूजल का निष्कर्षण करने वाले सभी उद्योगों को सीजीडब्ल्यूए द्वारा अनुमोदित एजेंसियों के प्रमाणित लेखा परीक्षकों के माध्यम से द्विवार्षिक (दो वर्ष में एक बार) जल लेखा परीक्षा करनी होगी और इसके पूरा होने के तीन माह के भीतर सीजीडब्ल्यूए को लेखापरीक्षा रिपोर्ट प्रस्तुत करनी होगी। पहले दी गई रिपोर्टों के अनुपालन की जाँच एक वर्ष के बाद प्रमाणित जल लेखा परीक्षकों द्वारा की जाए और इस संबंध में रिपोर्ट सीजीडब्ल्यूए के साथ साझा की जाए ।

ऐसे सभी उद्योगों को उपयुक्त उपायों के माध्यम से अगले तीन वर्षों में अपने भूजल के उपयोग में कम से कम 20% तक कटौती करनी होगी।"

(ii) खंड (iv) के लिए निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(iv). औद्योगिक क्षेत्रों (केंद्रीय/राज्य सरकार द्वारा निर्दिष्ट या अधिसूचित) में, केंद्रीय भूमि जल बोर्ड (सीजीडब्ल्यूबी) स्थानीय जल-भूवैज्ञानिक स्थितियों के अनुसार आवश्यकता-आधारित पीज़ोमीटर का निर्माण करेगा और जल स्तर की मॉनिटरिंग करेगा।

ऊपर उल्लिखित औद्योगिक क्षेत्रों के अतिरिक्त हार्ड रॉक एक्विफर प्रकार के लिए 100 घन मीटर /दिन से अधिक और एल्यूवियम एक्विफर प्रकार के लिए 500 घन मीटर /दिन से अधिक भूजल की निकासी के लिए परिसर के भीतर प्रेक्षण कुओं/(पीजोमीटर) का निर्माण और धारा 14 में उल्लिखित उपयुक्त जल स्तर मॉनिटरिंग तंत्र की स्थापना उद्योगों/अवसंरचना निकासी / निकासी के प्रस्ताव के लिए अनिवार्य होगी। इन क्षेत्रों में जल स्तर की मॉनिटरिंग परियोजना प्रस्तावकों द्वारा की जाएगी। यदि टैप किया गया जलभृत कठोर चट्टानी है तो निष्कर्षण संरचना और पीजोमीटर के बीच न्यूनतम दूरी 15 मीटर होगी और यदि जलभृत जलोढ़ है तो यह दूरी 50 मीटर होगी । पीजोमीटर में टैप की गई गहराई और जलभृत क्षेत्र पम्पिंग कुएं/कुओं के समान होंगे। पीजोमीटर के डिजाइन और निर्माण के लिए विस्तृत दिशा-निर्देश अनुबंध II में दिए गए हैं। वेब पोर्टल के माध्यम से सीजीडब्ल्यूए को मासिक जल स्तर डेटा प्रस्तुत किया जाएगा" ।

(iii) खंड (ग) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(ग). खारे भूजल के निष्कर्षण के मामले में, किसी भी एनएबीएल मान्यता प्राप्त प्रयोगशाला या सरकार द्वारा अनुमोदित प्रयोगशाला से मौजूदा बोरवेल/ट्यूबवेल/कुएं के भूजल गुणवत्ता डेटा।

नोट: नई परियोजनाओं के मामले में खारे भूजल की निकासी के लिए उपर्युक्त प्रयोगशालाओं से जल की गुणवत्ता के आंकड़े/ निकटवर्ती मौजूदा कुओं की रिपोर्ट प्रस्तुत की जा सकती है।

(iv) खंड (घ) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(घ) सभी नई परियोजनाओं के लिए नई स्थापना/प्रचालन के आरंभ के प्रमाण के रूप में दस्तावेज अर्थात स्थापना के लिए सहमति/पर्यावरणीय मंजूरी/किसी वैधानिक एजेंसी से कोई अन्य दस्तावेज।

(v) खंड (ङ) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(ङ)आवेदक द्वारा सरकारी एजेंसी को प्रस्तुत वर्षा जल संचयन योजना की प्रति अथवा आवास और शहरी मामलों के मंत्रालय, भारत सरकार द्वारा जारी प्रचलित मॉडल बिल्डिंग उपनियमों के अनुसार परियोजना परिसर में वर्षा जल संचयन / पुनर्भरण का प्रस्ताव।.

(vi) खंड (च) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(च)**प्रभाव आकलन रिपोर्ट:** अति-दोहित, गंभीर और अर्ध-महत्वपूर्ण क्षेत्रों में 100 घन मीटर/दिन से अधिक और गैर-जलोढ़ आच्छादित क्षेत्रों में 500 घन मीटर/दिन से अधिक और सुरक्षित आकलन इकाइयों में जलोढ़ क्षेत्रों में 2000 घन मीटर/दिन से अधिक भूजल निकालने वाली सभी परियोजनाओं को अनिवार्य रूप से मान्यता प्राप्त सलाहकारों द्वारा तैयार परियोजना स्थल के आसपास के 5 किमी त्रिज्या क्षेत्र को शामिल करते हुए भूजल प्रणाली पर मौजूदा / प्रस्तावित भूजल निकासी के प्रभाव मूल्यांकन रिपोर्ट और भूजल मॉडलिंग अध्ययन को अनिवार्य रूप से प्रस्तुत करना होगा। रिपोर्ट का प्रपत्र अनुबंध IV में दिया गया है।".

6. पैरा 4.2 में,

(i). खंड (ii) के स्थान पर निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"ii) 100 घन मीटर/दिन से अधिक भूजल निकालने/प्रस्तावित करने वाले खानों के लिए के लिए मासिक भूजल स्तर की मॉनिटरिंग के लिए परिसर में परिधि के साथ प्रेक्षण कुएं (पीजोमीटर) का निर्माण अनिवार्य होगा। पीजोमीटर में टैप की गई गहराई और जलभृत क्षेत्र बफर क्षेत्र में सिंचाई/ पेय जल के लिए उपयोग किए जाने वाले जलभृत के अनुरूप होगा। पीजोमीटर के डिजाइन और निर्माण के लिए विस्तृत दिशा-निर्देश अनुबंध II में दिए गए हैं।".

(ii). खंड (ख) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्: -

"(ख) आवेदक द्वारा सरकारी एजेंसी को प्रस्तुत वर्षा जल संचयन योजना की प्रति अथवा आवास और शहरी मामलों के मंत्रालय, भारत सरकार द्वारा जारी प्रचलित मॉडल भवन उपनियमों के अनुसार परियोजना परिसर में वर्षा जल संचयन / पुनर्भरण के लिए प्रस्ताव अथवा जैसा कि खान के परिसर में व्यवहार्य है और जैसा कि सीजीडब्ल्यूए/राज्य एजेंसियों द्वारा अनुमोदित है"|

(iii). खंड (ग) के बाद, एक और खंड (घ) अंतःस्थापित किया जाएगा, अर्थात्:-

"(घ) सभी नई परियोजनाओं के लिए नई परियोजना/प्रचालन की शुरुआत के प्रमाण के रूप में दस्तावेज अर्थात स्थापना के लिए सहमति/पर्यावरणीय मंजूरी/किसी वैधानिक एजेंसी से कोई अन्य दस्तावेज।".

7. पैरा 4.3 में:-

(i). उप पैरा 3 में, "आधारभूत परियोजनाओं की सांकेतिक सूची अनुलग्नक VI में दी गई है" शब्दों के स्थान पर, "पेय /घरेलू उपयोग के लिए भूजल की आवश्यकता वाले वाणिज्यिक आधारभूत परियोजनाओं को भी इस श्रेणी के अंतर्गत शामिल किया जाएगा"। इसके अतिरिक्त स्थान विशिष्ट आधारभूत परियोजनाओं की सांकेतिक सूची अनुबंध VI में दी गई है" को इसके बाद दिए गए संशोधित अनुबंध VI द्वारा प्रतिस्थापित किया जाएगा।

(ii). खंड (v) के बाद, एक और खंड (vi) जोड़ा जाएगा, अर्थात्:-

"(vi) सभी स्टेडियम, क्रिकेट मैदान और अन्य खेल मैदान/कोर्ट, गोल्फ कोर्स आदि भूजल के कृत्रिम पुनर्भरण/वर्षा जल संचयन के लिए उपयुक्त प्रणाली तंत्र का निर्माण/स्थापना करेंगे।

(iii). खंड (क) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(क) ऐसे मामलों में जहां डीवाटरिंग शामिल है, मान्यता प्राप्त सलाहकार द्वारा क्षेत्र में भूजल की स्थिति पर 5 किमी के दायरे में भूजल मॉडलिंग सहित प्रभाव आकलन रिपोर्ट प्रस्तुत करना, जिसमे पंपिंग की विस्तृत योजना, पंप किए गए जल के प्रस्तावित उपयोग और व्यापक भूजल व्यवस्था के प्रभाव का आकलन अनिवार्य होगा। इस रिपोर्ट में किसी भी प्रकार के महत्वपूर्ण पर्यावरणीय मुद्दों जैसे भूजल स्तर में गिरावट, भूस्खलन आदि को दूर करने के लिए पर्यावरणीय जोखिमों और प्रस्तावित प्रबंधन कार्यनीतियों को उजागर करना होगा ।

(iv). खंड (ङ) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्: -

"(ङ) आवेदक द्वारा सरकारी एजेंसी को प्रस्तुत वर्षा जल संचयन योजना की प्रति या आवास और शहरी मामलों के मंत्रालय, भारत सरकार द्वारा जारी प्रचलित मॉडल बिल्डिंग उपनियमों के अनुसार परियोजना परिसर में वर्षा जल संचयन / पुनर्भरण के लिए प्रस्ताव ।".

(v). खंड (छ) के बाद, एक और खंड (ज) अंतःस्थापित किया जाएगा, अर्थात्: -

"(छ) सभी नई परियोजनाओं के लिए भवन योजना अनुमोदन या किसी वैधानिक एजेंसी से नई परियोजना के प्रमाण के रूप में कोई अन्य प्रासंगिक दस्तावेज।"।

8. पैरा 5.1 के तहत खंड I में, तालिका 5.1के स्थान पर, निम्नलिखित तालिका 5.1को प्रतिस्थापित किया जाएगा, अर्थात्:

तालिका 5.1 पेय और घरेलू उपयोग के लिए भूजल निकासी शुल्क

भूजल निकासी की मात्रा (घन मीटर /दिन)	**भूजल निकासी शुल्क की दर (रु. प्रति घन मीटर)**
0-25	कोई शुल्क नहीं
> 25- < 200	1.00
200 और अधिक	2.00

पेय /घरेलू उपयोग के लिए जल की आपूर्ति करने वाली सरकारी/सरकार द्वारा अधिकृत एजेंसियां तथा सरकारी आधारभूत परियोजनाओं को भूजल निकासी की मात्रा पर विचार किए बिना भूजल निकासी शुल्क @ 0.50 रुपये प्रति घन मीटर का भुगतान करना होगा" ।

9. पैरा 6.0, उप पैरा 2 में निम्नलिखित को प्रतिस्थापित किया जाएगा, अर्थात्:-

"ऐसे सभी उपयोगकर्ता जिनके द्वारा भूजल की निकासी की जा रही है और निजी टैंकरों के माध्यम से थोक जल आपूर्ति के उद्देश्य से इसका उपयोग किया जा रहा है , उन्हें सीजीडब्ल्यूए द्वारा समय-समय पर जारी और अद्यतन किए गए थोक जल आपूर्तिकर्ताओं के दिशानिर्देशों के अनुसार अनिवार्य रूप से भू-जल निकासी के लिए अनापत्ति प्रमाण पत्र प्राप्त करना होगा।"

10. पैरा 7.0, उप पैरा 3 मेंनिम्नलिखित को प्रतिस्थापित किया जाएगा, अर्थात्:-

"खारे भूजल का निष्कर्षण सीजीडब्ल्यूए द्वारा खारे भूजल निकासी के लिए समय-समय पर जारी और अद्यतन दिशानिर्देशों के अनुसार होगा ।"

11. पैरा 8.0 में,

उप पैरा 2 में निम्नलिखित को प्रतिस्थापित किया जाएगा, अर्थात्:-

"सीमांकित आर्द्र-भूमि क्षेत्रों की परिधि से 500 मीटर के भीतर आने वाली परियोजनाओं को अनिवार्य रूप से विस्तृत प्रस्ताव प्रस्तुत करना होगा, जिसमें यह उल्लेख किया गया हो कि परियोजना प्रस्तावक द्वारा भूजल निकासी से किसी भी संरक्षित आर्द्रभूमि क्षेत्र पर विपरीत प्रभाव नहीं पड़ रहा है । इसके अतिरिक्त सीजीडब्ल्यूए से अनुमति लेने से पूर्व परियोजनाओं को क्षेत्र में अपनी परियोजनाओं को स्थापित करने के लिए उपयुक्त आर्द्रभूमि प्राधिकरण/राज्य प्राधिकरण या किसी अन्य उपयुक्त स्थानीय सरकारी प्राधिकरण से सहमति/अनुमोदन लेना होगा।"

12. पैरा 9.0 में:-

(i). खंड (i) के स्थान पर निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"(i). अनापत्ति प्रमाण पत्र का आवेदन करने वाले सभी उपयोगकर्ताओं के लिए एब्स्ट्रेक्शन स्ट्रक्चर में टेलीमेट्री सिस्टम सहित टैम्पर प्रूफ डिजिटल वाटर फ्लो मीटर/प्री पेड मीटर (एस) (बीआईएस/आईएस मानकों के अनुरूप) की संस्थापना अनिवार्य होगी और अनापत्ति प्रमाण पत्र प्रदान करने के 30 दिनों के भीतर इसकी संस्थापना के विषय में वेब-पोर्टल के माध्यम से सीजीडब्ल्यूए को सूचित किया जाए ।

यदि भूजल निष्कर्षण एक ही परिसर के भीतर कई बोर/नलकूपों से होता है, तो टैम्पर-प्रूफ डिजिटल जल प्रवाह मीटर/ टेलीमेट्री के साथ प्री पेड मीटर को सामान्य आउटलेट बिंदु पर स्थापित किया जा सकता है।

(ii). खंड (iv) के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"iv. प्रस्तावक द्वारा धारा 5 में दी गई दरों के अनुसार भूजल निकासी की मात्रा के आधार पर भूजल निकासी / बहाली शुल्क का भुगतान किया जाएगा ।

(iii). खंड (v) के स्थान पर निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्:-

"v. भूजल स्तर की मॉनिटरिंग के उद्देश्य से निर्मित प्रेक्षण कुएं (पीजोमीटर) धारा 14 के अनुसार संस्थापित किए जाएंगे। जल स्तर के आंकड़े वेब पोर्टल के माध्यम से सीजीडब्ल्यूए को उपलब्ध कराए जाएंगे। पीजोमीटर के निर्माण के लिए विस्तृत दिशा-निर्देश अनुबंध-II में दिए गए हैं।"।

(iv). खंड IX के लिए, निम्नलिखित खंड को प्रतिस्थापित किया जाएगा, अर्थात्: -

"ix. स्वामित्व में परिवर्तन के मामले में, परिसर के नए मालिक को परिसर का कब्जा लेने के 60 दिनों के भीतर दस्तावेजी प्रमाण के साथ अनापत्ति प्रमाण पत्र में आवश्यक परिवर्तन शामिल करने के लिए आवेदन करना होगा।"।

13. पैरा 14.0 में,

(i). उप पैरा 1 के स्थान पर निम्नलिखित को प्रतिस्थापित किया जाएगा, अर्थात्:-

"इसके पश्चात उल्लिखित औद्योगिक क्षेत्रों के अतिरिक्त , सभी परियोजना प्रस्तावकों (हार्ड रॉक एक्विफर प्रकार के लिए 100 घन मीटर /दिन से अधिक और एल्यूवियम एक्विफर प्रकार के लिए 500 घन मीटर /दिन से अधिक भूजल की निकासी के लिए) को अनिवार्य रूप से भूजल स्तर की मॉनिटरिंग के लिए अपने परिसर के भीतर पीज़ोमीटर (प्रेक्षण कुएँ) का निर्माण करना होगा। । इसके अतिरिक्त औद्योगिक क्षेत्रों में (केंद्र / राज्य सरकार द्वारा निर्दिष्ट या अधिसूचित), केंद्रीय भूमि जल बोर्ड (सीजीडब्ल्यूबी) स्थानीय भूगर्भीय स्थितियों और जल स्तर की मॉनिटरिंग के अनुसार आवश्यकता-आधारित पीजोमीटर का निर्माण करेगा। परियोजना क्षेत्र में भूजल स्तर की नियमित मॉनिटरिंग को सुनिश्चित करने के उद्देश्य से ऐसा अनुपालन तंत्र बनाया गया है। इस संबंध में परियोजना प्रस्तावकों द्वारा पीजोमीटर के माध्यम से जल स्तर की मॉनिटरिंग के लिए आवश्यक मानदंड तालिका 14.1 में दिए गए हैं"।

(ii). तालिका 14.1 के लिएनिम्नलिखित तालिका को प्रतिस्थापित किया जाएगा, अर्थात्: -

तालिका 14.1 डिजिटल वाटर लेवल रिकॉर्डर (डीडब्ल्यूएलआर **)और टेलीमेट्री के साथ निर्माण किए जाने वाले पीज़ोमीटर की संख्या और जल स्तर मॉनिटरिंग तंत्र के प्रकार**

क्र. सं .	भूजल निकासी की मात्रा (घन मीटर /दिन)	पीजोमीटर की संख्या (डीडब्ल्यूएलआर और टेलीमेट्री की सहित)
1.	0-100	0
2.	>100 (औद्योगिक क्षेत्रों के अतिरिक्त में हार्ड रॉक एक्विफर)	1
3.	>500 (औद्योगिक क्षेत्रों के अतिरिक्त में जलोढ़ जलभृत)	1

14. पैरा 16.0 में तालिका 16.1 में,

(i). क्रम संख्या 2, अर्थात "गैर प्रकटीकरण / अतिरिक्त भूजल निष्कर्षण संरचनाओं का निर्माण

ए) गैर-कार्यात्मक संरचनाएं।

बी) अप्रचलित / परित्यक्त

नोट: दी गई दरें गैर-कार्यात्मक/अप्रचलित /परित्यक्त संरचनाओं के लिए हैं। समेकित जुर्माने के आंकड़े के लिए इसे ऐसी कुल संरचनाओं से गुणा किया जाएगा "।

को निम्नलिखित से प्रतिस्थापित किया जाएगा

"अतिरिक्त भूजल निष्कर्षण संरचनाओं का गैर-प्रकटीकरण/निर्माण

क) कार्यात्मक / गैर-कार्यात्मक संरचनाएं।

बी) अप्रचलित / परित्यक्त

नोट: दी गई दरें कार्यात्मक/गैर-कार्यात्मक/अप्रचलित /परित्यक्त संरचनाओं के लिए हैं। समेकित जुर्माने के आंकड़े के लिए इसे ऐसी कुल संरचनाओं से गुणा किया जाएगा "।

(ii). क्रम संख्या 7 के तहत, "पुनर्भरण संरचनाओं का रखरखाव न होना" शब्दों के स्थान पर "जल संरक्षण संरचनाओं/पुनर्भरण संरचनाओं का रखरखाव न होना" शब्दों को प्रतिस्थापित किया जाएगा।

(iii). पैरा 16.0 में उप पैरा 2 को प्रतिस्थापित किया जाएगा, अर्थात्:

" नए एनओसी / एनओसी के नवीनीकरण के लिए आवेदन शुल्क समय-समय पर सीजीडब्ल्यूए द्वारा निर्धारित दरों के अनुसार लिया जाएगा और इसे आधिकारिक वेब पोर्टल के माध्यम से सूचित किया जाएगा। मौजूदा जारी किए गए अनापत्ति प्रमाण पत्र में सुधार/संशोधन के लिए भी शुल्क देय होगा।".

(iv). तालिका 16.2 में,

i. तालिका के शीर्षक/शीर्षक के अंतर्गत, "प्रस्तावित शुल्क" शब्दों के स्थान पर "शुल्क" शब्द प्रतिस्थापित किया जाएगा ।

ii. क्रम. संख्या 1 (अर्थात शब्द "लागू शुल्क सहित रिचार्ज मात्रा में परिवर्तन") का लोप किया जाएगा।

15. अनुलग्नक II मेंबुलेट बिंदु 1 के स्थान परनिम्नलिखित बुलेट बिंदु प्रतिस्थापित किया जाएगा, अर्थात्:-

यदि टैप किए जाने वाला जलभृत कठोर चट्टान है तो भूजल निकाले जाने वाले पम्पिंग कुएं से पीज़ोमीटर को 15 मीटर की न्यूनतम दूरी पर संस्थापित / निर्मित किया जाना है । यदि जलभृत जलोढ़ है तो यह दूरी 50 मीटर होगी । पीज़ोमीटर का व्यास लगभग चार इंच से छह इंच होना चाहिए।

16. उक्त दिशा-निर्देशों में, अनुलग्नक VI को निम्नलिखित अनुसार प्रतिस्थापित किया जाएगा:

"अनुबंध VI

स्थान विशिष्ट अवसंरचना परियोजनाओं की सांकेतिक सूची

क्र. सं.	**अवसंरचनात्मक परियोजनाएं**
1.	विशेष आर्थिक क्षेत्र
2.	मेट्रो स्टेशन/रेलवे स्टेशन और बस डिपो
3.	हवाई अड्डे, बंदरगाह, लॉजीस्टिक, कार्गो और गोदाम

4.	हाईवे इंफ्रास्ट्रक्चर
5.	अग्निशमन केंद्र
6.	अस्पताल और नर्सिंग होम
7.	स्कूल, कॉलेज, विश्वविद्यालय, कोचिंग संस्थान, प्रशिक्षण केंद्र/कौशल विकास केंद्र सहित शैक्षणिक संस्थान

नोट:- भूजल उपयोग के लिए एनओसी की आवश्यकता में पेयजल/घरेलू उपयोग के लिए जल की आवश्यकता भी शामिल है।

17. उक्त दिशा-निर्देशों मेंअनुलग्नक VIII को निम्नलिखित अनुसार प्रतिस्थापित किया जाएगा:

"अनुबंध VIII

ऐसे राज्यों/केंद्र शासित प्रदेशों की सूची जहां केंद्रीय भूजल प्राधिकरण द्वारा भूजल निकासी का विनियमन किया जा रहा है

1.	अंडमान और निकोबार
2.	असम
3.	अरुणाचल प्रदेश
4.	बिहार
5.	छत्तीसगढ
6.	दादरा और नगर हवेली एवं दमन और दीव
7.	गुजरात
8.	झारखंड
9.	मध्य प्रदेश
10.	महाराष्ट्र
11.	मणिपुर
12.	मेघालय
13.	मिजोरम
14.	नागालैंड
15.	ओडिशा
16.	राजस्थान
17.	सिक्किम
18.	त्रिपुरा
19.	उत्तराखंड

नोट: उपरोक्त सूची परिवर्तनशील है और इसमें किसी भी प्रकार के जोड़/लोप को सीजीडब्ल्यूए द्वारा अपने आधिकारिक वेब पोर्टल के माध्यम से राज्यों/संघ शासित प्रदेशों, परियोजना प्रस्तावकों सहित उद्योगों को सूचित किया जाएगा।

18. अनुलग्नक IX (प्रयुक्त तकनीकी शब्दों की शब्दावली) में क्रम संख्या 17 के तहत, "पेय और घरेलू उपयोग: पेय और घरेलू उपयोग के अलावा, यह श्रेणी अस्पताल, होटल, मॉल और मल्टीप्लेक्स, संस्थानों, कार्यालय, बैंकेट हॉल, फायर स्टेशन, मेट्रो स्टेशन, रेलवे स्टेशन, हवाई अड्डा, बंदरगाह, स्टेडियम आदि औद्योगिक प्रक्रिया के लिए आवश्यक जल नहीं बल्कि औद्योगिक के पेय जरूरतों को कवर करेगी" शब्दों के स्थान पर " **पेय और घरेलू उपयोग:** स्वच्छ उद्देश्यों यथा खाना पकाने, स्नान, सफाई/ धुलाई, स्वच्छता आदि सहित दैनिक घरेलू गतिविधियों के लिए आवश्यक जल। पेय और घरेलू उपयोग के अलावा, यह श्रेणी अस्पताल, होटल, मॉल और मल्टीप्लेक्स, संस्थानों, कार्यालय, बैंकेट हॉल, फायर स्टेशन, मेट्रो

स्टेशन, रेलवे स्टेशन, हवाई अड्डा, बंदरगाह, स्टेडियम आदि औद्योगिक प्रक्रिया के लिए आवश्यक जल नहीं बल्कि औद्योगिक के पेय जरूरतों को कवर करेगी" प्रतिस्थापित किया जाएगा।।

19. **अनुलग्नक X** में, शीर्षक के अंतर्गत, "उद्योगों द्वारा वार्षिक वाटर ऑडिट (स्रोत-CII)" शब्दों के स्थान पर, "उद्योगों द्वारा जल ऑडिट" शब्दों को प्रतिस्थापित किया जाएगा। ”

[फा. सं. 23014/29/2021-समन्वय अनुभाग-भाग(2)]

आशीष कुमार, निदेशक

नोट: 'भारत के भूजल निकासी को विनियमित और नियंत्रित करने के दिशानिर्देश' भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में एस.ओ. 3289 (ई) द्वारा दिनांक 24 सितंबर, 2020 को प्रकाशित किए गए थे ।

MINISTRY OF JAL SHAKTI

(Department of Water Resources, River Development and Ganga Rejuvenation)

(CENTRAL GROUND WATER AUTHORITY)

NOTIFICATION

New Delhi, the 29th March, 2023

S.O. 1509(E).— In exercise of the powers conferred by sub-section (3) of section 3 read with section 5 of the Environment (Protection) Act, 1986 (29 of 1986), the Department of Water Resources, River Development & Ganga Rejuvenation, hereby makes the following amendments to the guidelines to regulate and control groundwater extraction in India, published in the Gazette of India, Extraordinary, Part II, section 3, sub-section (ii), vide Notification number S.O. 3289 (E) 24th September, 2020, namely:-

In the said notification, for the Schedule, the following changes in the Schedule shall be substituted/added, namely:-

“Schedule

1. In the Guidelines to regulate and control groundwater extraction in India, 2020 -

(a). in the Index, Item no. 16.0 ,for the words “Provisions of Penalty” the words “Provision of Penalty and Charges for correction/modifications in NOCs” shall be substituted.

(b). in the index, in the Annexures, for the words, “Annexure VI : Indicative list of Infrastructure projects”, the words, “Annexure VI : Indicative list of location specific Infrastructure projects” shall be substituted.

(c). in the index, in the Annexures, for the words, “Annexure X : Annual water audits by the industries” , the words, “Annexure X : Water audits by the industries” shall be substituted.

2. In the said guidelines, in the paragraph 1.0, after clause (v), clauses (vi),(vii) shall be added namely:-

“(vi) All industries/ mining projects/ infrastructure projects drawing ground water only for drinking/ domestic purposes up to 5 Cum /day in all assessment units.

(vii) Residential Apartments and Group Housing Societies:

(a) For drinking water and domestic uses, drawing ground water upto 20 m^3/day subject to the conditions mentioned in Para 2.0 of the guidelines.

(b) Dwelling units for Economically Weaker Sections (EWS) under Government schemes.”.

3. In the said guidelines, in the paragraph 2.0:-

(i). Sub-para 2 shall be added namely-:

“Installation of digital water flow meter (conforming to BIS/ IS standards) in all abstraction structure(s) shall be mandatory for all Residential Apartments and Group Housing Societies. All Residential Apartments and Group Housing Societies having swimming pools drawing ground water shall be mandatorily required to seek No Objection Certificate.”

(ii). for the clause (d), the following clause shall be substituted, namely:-
"d) In case of saline ground water extraction**,** ground water quality data of existing bore well/ tube well/ dug well from any National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratory or Govt. approved laboratory.

Note: In case of new projects, water quality data/report of nearby existing wells from above-mentioned laboratories may be submitted for saline ground water extraction.".

(iii). for the clause (e), the following clause shall be substituted, namely:-

"e) Copy of Rain Water Harvesting Plan submitted to Government agency by the applicant or a proposal for rain water harvesting/ recharge in the project premises as per the prevailing Model Building Bye Laws issued by Ministry of Housing & Urban Affairs, Government of India.".

(iv). in the paragraph 2.0, after the clause (e), one more clause (f), shall be inserted/added, namely:-

"f) For all New projects, a self declaration/ affidavit (duly notarized) indicating date of completion of project shall be required.".

4. In the paragraph 4.0, for sub para 3, the following sub para shall be substituted, namely:-

"Commercial entities extracting ground water shall be required to submit online water audit report including an audit of water use as mentioned in the relevant sections. CGWA/ State Ground Water Authority (SGWA) shall publish all such audit reports online.".

5. In the paragraph 4.1:-

(i). for clause (iii), the following clause shall be substituted, namely:-

"(iii). All industries abstracting ground water in excess of 100 m^3/day shall be required to undertake biennial (once in two years) water audit through certified auditors of agencies as approved by CGWA and submit audit reports within three months of completion of the same to CGWA. Compliance of the earlier given reports may be checked by certified water auditors after one year and the report in this regard may be shared with CGWA.

All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.".

(ii). for clause (iv), the following clause shall be substituted, namely:-

"(iv). In industrial areas (as designated or, notified by Central/State Government), Central Ground Water Board (CGWB) shall construct need-based piezometers as per local hydro-geological conditions and further monitor water levels.

In other than industrial areas as mentioned above, construction of observation well(s)/(piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in Section 14 shall be mandatory for industries/Infrastructure drawing/ proposing to draw more than 100 m^3 /day of ground water for Hard rock aquifer type and more than 500 m^3 /day of ground water for Alluvium aquifer type. Monitoring of water levels in these areas shall be done by the project proponents. Minimum distance between the abstraction structure and piezometer will be 15 m if the aquifer tapped is hard rock and 50 m if the aquifer is alluvium**.** Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/wells. Detailed guidelines for design and construction of piezometers are given in Annexure II. Monthly water level data shall be submitted to the CGWA through the web portal.".

(iii). for clause (c), the following clause shall be substituted, namely:-

"(c). In case of saline ground water extraction, ground water quality data of existing bore well/ tube well/ dug well from any NABL accredited laboratory or Government approved laboratory.
Note**:** In case of new projects, water quality data / report of nearby existing wells from above-mentioned laboratories may be submitted for saline ground water extraction.".

(iv). for clause (d), the following clause shall be substituted, namely:-

"(d). For all new projects, document as proof of new establishment / commencement of operation i.e. Consent to Establish/ Environmental Clearance/ any other document from a statutory agency.".

(v). for clause (e), the following clause shall be substituted, namely:-

"(e). Copy of Rain Water Harvesting Plan submitted to Government agency by the applicant or a proposal for rain water harvesting/ recharge in the project premises as per the prevailing Model Building Bye Laws issued by Ministry of Housing & Urban Affairs, Government of India.".

(vi). for clause (f), the following clause shall be substituted, namely:-

"(f). **Impact Assessment report:** All projects extracting/proposing to extract ground water in excess of 100 m^3 /day in Over-exploited, Critical and Semi-critical areas and in excess of 500 m^3/day in areas underlain by non-alluvium and 2000 m^3/day in areas underlain by alluvium in Safe assessment units shall have to mandatorily submit impact assessment report and ground water modeling study of existing/ proposed ground water withdrawal on the ground water regime covering 5 KM radius area around the project site prepared by accredited consultants. Pro-forma for the report is given in Annexure IV.".

6. In the paragraph 4.2,

(i). for clause (ii), the following clause shall be substituted, namely:-

"ii) Construction of observation well(s) (piezometers) along the periphery in the premises, for monthly ground water level monitoring, shall be mandatory for mines drawing/ proposing to draw more than 100 m^3 /day of ground water. Depth and aquifer zone tapped in the piezometer shall be commensurate with aquifer used for irrigation/drinking water in the buffer area. Detailed guidelines for design and construction of piezometers are given in Annexure II.".

(ii). for clause (b), the following clause shall be substituted, namely:-

"(b) Copy of Rain Water Harvesting Plan submitted to Government agency by the applicant or a proposal for rain water harvesting/ recharge in the project premises as per the prevailing Model Building Bye Laws issued by Ministry of Housing & Urban Affairs, Government of India or as feasible in the mine premises and as approved by CGWA/State agencies".

(iii). after clause (c), one more clause (d) shall be inserted, namely:-

"(d) For all New projects, document as proof of new project / commencement of operation i.e. Consent to Establish/ Environmental Clearance / any other document from a statutory agency.".

7. In the paragraph 4.3:-

(i). in the sub para 3, for the words "Indicative list of Infrastructure projects is given in Annexure VI", the words "Commercial infrastructure projects requiring ground water for drinking /domestic use shall also be covered under this category**.** Further, the Indicative list of location specific Infrastructure projects is given in Annexure VI" shall be substituted by revised Annexure VI given hereafter.

(ii). after clause (v), one more clause (vi) shall be inserted, namely:-

"(vi) All stadiums, cricket grounds, and other sports grounds/courts, golf courses etc shall construct/install appropriate mechanism for artificial recharge of ground water / rain water harvesting.

(iii). for clause (a), the following clause shall be substituted, namely:-

"(a) In cases where dewatering is involved, submission of impact assessment report along with groundwater modelling in 5 km radius prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.".

(iv). for clause (e), the following clause shall be substituted, namely:-

"(e) Copy of Rain Water Harvesting Plan submitted to Government agency by the applicant or a proposal for rain water harvesting/ recharge in the project premises as per the prevailing Model Building Bye Laws issued by Ministry of Housing & Urban Affairs, Government of India.".

(v). after clause (g), one more clause (h) shall be inserted, namely:-

"(h) For all New projects, building plan approval or any other relevant document as proof of new project from a statutory agency.".

-

8. In the Section I under paragraph 5.1, for the table 5.1, the following table 5.1 shall be substituted, namely:-

"Table 5.1 Ground Water Abstraction charges for Drinking & Domestic use

Quantum of Groundwater withdrawal (m^3/day)	**Rate of ground water abstraction charges (Rs. per $m^{3)}$**
0-25	No Charge
> 25- < 200	1.00
200 and above	2.00

Government/ Government authorized agencies supplying water for drinking/ domestic use and Government infrastructure projects shall pay ground water abstraction charges @ Rs. 0.50 per m^3 irrespective of quantum of ground water abstraction.".

9. In the paragraph 6.0, sub para 2, the following shall be substituted, namely:-

"All those users abstracting ground water and using it for supply as bulk water supplies through private tankers shall mandatorily seek No Objection Certificate for ground water abstraction as per Guidelines for Bulk water suppliers as issued and updated by CGWA from time to time.".

10. In the paragraph 7.0, sub para 3, the following shall be substituted, namely:-

"Abstraction of saline ground water shall be according to the Guidelines for Saline Ground Water Abstraction as issued and updated by CGWA from time to time.".

11. In the paragraph 8.0,

In the sub para 2, the following shall be substituted, namely:-

"Projects falling within 500 m from the periphery of demarcated wetland areas shall mandatorily submit a detailed proposal indicating that any ground water abstraction by the project proponent does not affect the protected wetland areas. Furthermore, before seeking permission from CGWA, the projects shall take consent/approval from the appropriate Wetland Authority/ State Authority or any other appropriate local government authority to establish their projects in the area.".

12. In the paragraph 9.0:-

(i). for clause (i), the following clause shall be substituted, namely:-

"(i). Installation of tamper proof digital water flow meter/ Pre Paid Meter (s) (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate through the web-portal.
In case the ground water extraction is from multiple bore/tube wells within the same premises, tamper-proof digital water flow meter(s)/Pre Paid Meter (s) with telemetry can be installed at common outlet point(s).".

(ii). for clause (iv), the following clause shall be substituted, namely:-

"iv. Proponents shall pay ground water abstraction/ restoration charges based on quantum of ground water extraction as applicable as per the rates given in Section 5.".

(iii). for clause (v), the following clause shall be substituted, namely:-

"v. Purpose-built observation wells (piezometers) for ground water level monitoring shall be installed as per Section 14**.** Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II.".

(iv). for clause ix, the following clause shall be substituted, namely:-

"ix. In case of change of ownership, new owner of the premises will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.".

13. In the paragraph 14.0,

(i). for sub para 1, the following shall be substituted, namely:-

"In other than industrial areas as mentioned hereafter, all the project proponents (drawing ground water more than 100 m^3 /day of ground water for Hard rock aquifer type and more than 500 m^3 /day of ground water for Alluvium aquifer type have to mandatorily construct Piezometers (observation wells) within their premises for monitoring of the ground water levels. Further, in industrial areas (as designated or notified by Central/State Government), Central Ground Water Board (CGWB) shall construct need-based piezometers as per local hydro-geological conditions and further monitor water levels. Such a mechanism of compliance conditions has been made to ensure regular monitoring of ground water level in the project area. In this regard the necessary criteria for monitoring of water levels through piezometers by the project proponents is given in Table 14.1.".

(ii). for Table 14.1, the following Table shall be substituted, namely:-

Table 14.1 No. of Piezometers with Digital Water Level Recorder (DWLR) and telemetry to be constructed & Type of Water Level Monitoring Mechanism

Sl. No.	Quantum of Ground water withdrawal (cum/day)	No. of piezometer(s) (with DWLR and telemetry required)
1.	0-100	0
2.	>100 (Hard rock aquifer type in other than industrial areas)	1
3.	>500 (Alluvium aquifer type in other than industrial areas)	1

14. In the paragraph 16.0, in the Table 16.1,

(i). Serial no. 2, i.e. "Non disclosure/ construction of additional groundwater abstraction structures
a) Non-functional Structures.
b) Defunct/Abandoned
Note: Given rates are for unit non-functional/ defunct/ abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty",

shall be substituted with

"Non disclosure/ construction of additional groundwater abstraction structures
a) Functional **/** Non-functional Structures.
b) Defunct / Abandoned
Note: Given rates are for unit Functional/non-functional/ defunct/ abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty."

(ii). under the serial no. 7, for the words, "Non maintenance of Recharge structures", the words "Non maintenance of water conservation structures/ recharge structures" shall be substituted.

(iii). in the paragraph 16.0, the sub para 2 shall be substituted, namely:-

"Application fee for fresh/ renewal of NOC shall be charged as per the rates prescribed by CGWA from time to time and intimated through the official web portal. Fee shall also be payable for correction/ modification in the existing issued No Objection Certificate letter.".

(iv). in the Table 16.2,

i. under the heading/heading of the table, for the words "Proposed Charges" the words "Charges" shall be substituted.

ii. the serial no. 1 (i.e the words " Change in recharge quantum including applicable charges") shall be deleted.

15. In the Annexure II, for bullet point 1, the following bullet point shall be substituted, namely:-

"The piezometer is to be installed / constructed at the minimum distance of 15 m if the aquifer tapped is hard rock and 50 m if the aquifer is alluvium from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about four inches to six inches.".

16. In the said guidelines, **Annexure VI** shall be substituted as given hereafter:

"Annexure VI

Indicative list of location specific Infrastructure Projects

Sl. No.	Infrastructure Projects
1.	Special Economic Zone
2.	Metro Station/Railway Station & Bus Depot
3.	Airport, Seaport, Logistics, Cargo & Warehouse
4.	Highway Infrastructure
5.	Fire station
6.	Hospitals & Nursing Homes
7.	Educational Institutions including schools, colleges, universities, coaching institutes, Training Centres/ Skill development centres

Note:- The requirement of NOC for Groundwater use may include the water requirement for drinking water/domestic uses also.

17. In the said guidelines, **Annexure VIII** shall be substituted as given hereafter:

"Annexure VIII

List of States/Union territories where ground water extraction is being regulated by Central Ground Water Authority

1.	Andaman & Nicobar
2.	Assam
3.	Arunachal Pradesh
4.	Bihar
5.	Chhattisgarh
6.	Dadra and Nagar Haveli and Daman & Diu
7.	Gujarat
8.	Jharkhand
9.	Madhya Pradesh
10.	Maharashtra

11.	Manipur
12.	Meghalaya
13.	Mizoram
14.	Nagaland
15.	Odisha
16.	Rajasthan
17.	Sikkim
18.	Tripura
19.	Uttarakhand

Note: The above list is dynamic in nature and any addition/deletion in this regard shall be communicated to the States/UTs, project proponents including industries by CGWA through its official web portal.".

18. In the **Annexure IX (Glossary of technical terms used)**, under the serial no. 17, for the words "Drinking and domestic use: Besides drinking & domestic use of households, this category will cover drinking requirement of industries not requiring water for industrial process; drinking, washing, cleaning use etc. in case of hospitals, hotels, malls & multiplexes, institutions, offices, banquet halls, fire stations, metro stations, railway stations, airports, sea ports, stadia etc.", the words,"**Drinking and domestic use**: Water required for daily household activities including hygienic purposes, such as cooking food, bathing, cleaning / washing, sanitation etc. Besides drinking & domestic use of households this category will cover drinking requirement of industries not requiring water for industrial process; drinking, washing, cleaning use etc. in case of hospitals, hotels, malls & multiplexes, institutions, offices, banquet halls, fire stations, metro stations, railway stations, airports, sea ports, stadia etc."shall be substituted.".

19. In the **Annexure X**, under the heading, for the words "Annual water audits by the industries (Source–CII)", the words, "Water audits by the industries" shall be substituted. "

[F. No. 23014/29/2021-Coordination Section- Part(2)]

ASHISH KUMAR, Director

Note: he 'Guidelines to control and regulate ground water extraction in India' were published in Gazette of India, Extraordinary, Part II, section 3, sub-section (ii) vide S.O. 3289 (E) dated 24th September, 2020.

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CENTRAL GROUND WATER AUTHORITY
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION

PUBLIC NOTICE NO. 26-1/CGWA/ 2015

Whereas the Central Government in exercise of powers under sub section (3) of the Environment (Protection) Act of 1986, constituted the Central Ground Water Authority (hereafter referred to as the Authority) *vide* notification of the Government of India in the Ministry of Environment & Forests number S.O. 1121(E), dated the 13th May, 2010, for the purposes of regulation and control of ground water development and management in the whole of India;

And whereas the Authority has been issuing No Objection Certificate (NOC) for withdrawal of ground water by industries/ infrastructure/ mining projects. During the period October, 2009 to November, 2012, NOCs issued by Central Ground Water Authority had no time frame for their validity. However, as per the existing guidelines of CGWA, NOCs are issued for a fixed period of validity.

And whereas some firms were exempted from obtaining NOC from the Authority as per the extant guidelines in the past. The Hon'ble National Green Tribunal vide it's order dated 15.04.2015 has made it mandatory for all existing users of ground water to seek NOC from Central Ground Water Authority.

Now therefore, Central Ground Water Authority, in exercise of powers under Section 5 of the Environment (Protection) Act, hereby directs all such users **who have been issued NOC without any validity period to apply for renewal of NOC by 31st December, 2017, failing which the NOC issued to them shall stand cancelled and they will have to apply afresh for NOC.** Further, such users who were exempted from the requirement of NOC earlier are hereby **directed to apply for NOC for ground water extraction by 31st December, 2017, failing which necessary action as per law shall be initiated.** Applications for issuance/ renewal of NOC are to be made online through NOCAP (http://cgwa-noc.gov.in).

(AKHIL KUMAR)
CHAIMAN
CENTRAL GROUND WATER AUTHORITY
04.10.2017

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION
CENTRAL GROUND WATER AUTHORITY

No. 26-1/CGWA/PN/2018 Dated 29.06.2018

PUBLIC NOTICE

SUB: ATTENTION OF ALL EXISTING GROUND WATER USERS INCLUDING INDUSTRIAL, INFRASTRUCTURE AND MINING PROJECTS.

Kind attention of all the existing ground water users including Industrial, Infrastructure and Mining Projects is invited to the public Notice No. 1/2018 dated 01.01.2018, under which the users have been directed to submit their applications for No Objection Certificate (NOC) to Central Ground Water Authority (CGWA) before 30.06.2018.

Due to ongoing modifications in the existing guidelines and to address the grievances of many ground water users in the country, it is considered necessary and expedient to extend the due date for submission of online applications through NOCAP upto 30.09.2018. All the users drawing ground water without a valid NOC are directed to submit their applications for NOC by or before the said date. It is clarified that any failure to submit applications before this date will render the concerned users responsible for no-compliance of the directions of CGWA and Hon'ble NGT.

All ground water users located in th e States/Union Territories, where ground water development is not being regulated by Central Ground Water Authority have to obtain NOC from the respective State/UT Ground Water Authorities. List of such States/Union Territories is available on th e web link: www.cgwa-noc.gov.in/Landing Page/Ground Water .htm

29.6.18
(K.C.NAIK)
CHAIRMAN
29.06.2018

ANNEXURE-R-11

GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTHI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION
CENTRAL GROUND WATER AUTHORITY
[Constituted under section 3(3) of Environment (Protection) Act, 1986]

No. 26-1/CGWA/PN/2018 Dated 01.04.2020

PUBLIC NOTICE

SUB: ATTENTION OF ALL EXISTING GROUND WATER USERS INCLUDING INDUSTRIAL, INFRASTRUCTURE AND MINING PROJECTS.

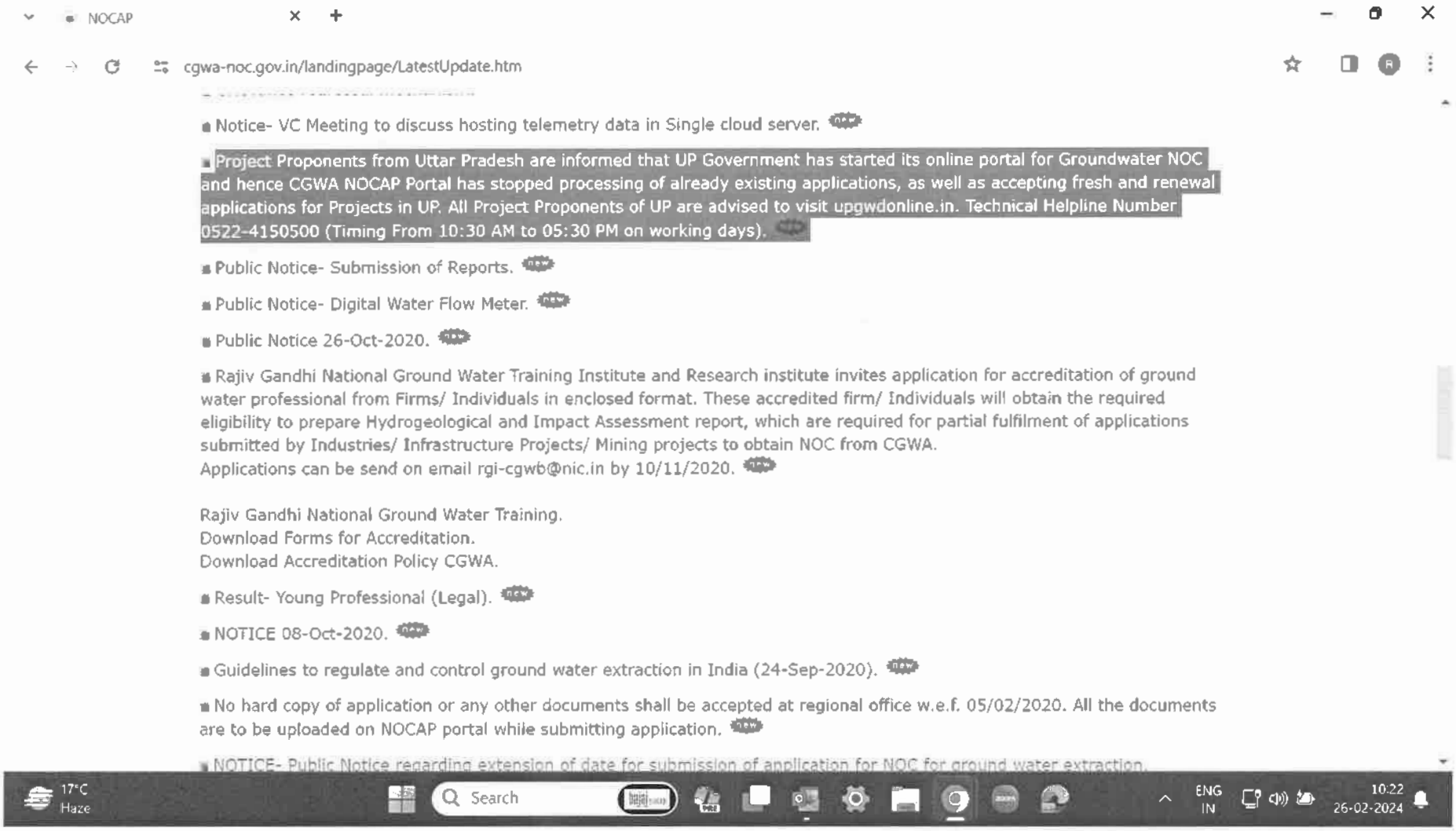
In view of the prevailing situation of lock down in the entire country due to COVID -19, the date for submission of application for NOC for ground water abstraction by the existing industries, infrastructure and mining projects is hereby extended till 30th June, 2020.

All the users drawing ground water are advised to submit their applications for NOC online through NOCAP portal of CGWA

No hard copy of application or any other documents are being accepted at Regional Office of CGWB in order to contain the pandemic. All the documents are to be uploaded on NOCAP portal while submitting application.

The detailed directions , existing guidelines etc., are available on the web link: www.cgwa-noc.gov.in/Landing Page/Ground Water .htm / cgwb.gov.in .

(G.C.PATI)
CHAIRMAN
01.04.2020


NOCAP
cgwa-noc.gov.in/landingpage/LatestUpdate.htm
Notice- VC Meeting to discuss hosting telemetry data in Single cloud server.
Project Proponents from Uttar Pradesh are informed that UP Government has started its online portal for Groundwater NOC and hence CGWA NOCAP Portal has stopped processing of already existing applications, as well as accepting fresh and renewal applications for Projects in UP. All Project Proponents of UP are advised to visit upgwdonline.in. Technical Helpline Number 0522-4150500 (Timing From 10:30 AM to 05:30 PM on working days).
Public Notice- Submission of Reports.
Public Notice- Digital Water Flow Meter.
Public Notice 26-Oct-2020.
Rajiv Gandhi National Ground Water Training Institute and Research institute invites application for accreditation of ground water professional from Firms/ Individuals in enclosed format. These accredited firm/ Individuals will obtain the required eligibility to prepare Hydrogeological and Impact Assessment report, which are required for partial fulfilment of applications submitted by Industries/ Infrastructure Projects/ Mining projects to obtain NOC from CGWA.
Applications can be send on email rgi-cgwb@nic.in by 10/11/2020.
Rajiv Gandhi National Ground Water Training.
Download Forms for Accreditation.
Download Accreditation Policy CGWA.
Result- Young Professional (Legal).
NOTICE 08-Oct-2020.
Guidelines to regulate and control ground water extraction in India (24-Sep-2020).
No hard copy of application or any other documents shall be accepted at regional office w.e.f. 05/02/2020. All the documents are to be uploaded on NOCAP portal while submitting application.
NOTICE- Public Notice regarding extension of date for submission of application for NOC for ground water extraction.
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Uttar Pradesh Shasan
Namami Gange Tatha Gramin Jalapurti Anubhag-3

In pursuance of the provisions of clause (3) of Article 348 of the Constitution, the Governor is pleased to order the publications of the following English translation of notification no.1(23/76-3-2020-10gw-2014, dated 6 October 2020.

NOTIFICATION

No.1(2376-3-2020-10gw-2014(Niyamavali)
Lucknow, Dated 6 October 2020

In exercise of the powers conferred by section 49 of the Uttar Pradesh Ground Water (Management and Regulation) Act, 2019 (U.P. Act no. 13 of 2019) *read* with section 21 of the Uttar Pradesh General Clauses Act, 1904 (U.P. Act no. 1 of 1904) the Governor is pleased to make the following rules with a view to amending the Uttar Pradesh Ground Water (Management and Regulation) Rules, 2020.

THE UTTAR PRADESH GROUND WATER (MANAGEMENT AND REGULATION) (FIRST AMENDMENT) RULES, 2020

Short title and commencement

1. (1) These rules may be called the Uttar Pradesh Ground Water (Management and Regulation) (First Amendment) Rules, 2020.

(2) They shall come into force with effect from the date of their publication in the Gazette.

Amendment of rule 2

2. In the Uttar Pradesh Ground Water (Management and Regulation) Rules, 2020 hereinafter referred to as the said rules in rule 2 in sub-rule (1) after clause (c), the following clause shall be *inserted*, namely: -

"(ca) Ground Water Fund" means fund created under section 48 of the Act for deposition of the receipts on account of penalties, registration fees, fee on ground water extraction etc. Account for Ground Water Fund shall be 8235002000400 under Public head Account."

Amendment of rule 6

3. In the said rules, in rule 6 , for sub-rules (2) and (3) set out in Column 1 below, the sub rules as set out in Column 2 shall be *substituted*, namely:-

COLUMN-1	COLUMN-2
Existing sub-rules	*Sub-rules as hereby substituted*
(2) Any existing Commercial or Industrial or Infrastructural or bulk user, who has sunk a well for extracting or using ground water in notified area or non-notified area before the date of coming into force of the Act, and have valid No Objection Certificate issued by either Central Ground Water Authority or by Ground Water Department, Uttar Pradesh for extracting or using ground water, shall make, in Form 1(B), an application referred to in sub-section (1) of section 10 or sub-section (1) of section 11 of the Act, within a period of ninety days from the date of coming into force of the Act, to the District Ground Water Management Council;	(2) Any existing Commercial or Industrial or Infrastructural or bulk user, who has sunk a well for extracting or using ground water in notified area or non-notified area before the date of coming into force of the Act, and has a valid No Objection Certificate issued by either Central Ground Water Authority or by Ground Water Department, Uttar Pradesh for extracting or using ground water, shall make, in Form 1(B), an application referred to in sub-section (1) of section 10 or sub-section (1) of section 11 of Act, within a period of one year from the date of coming into force of the Rules, to the District Ground Water Management Council;

(3) Every existing users of ground water, other than those mentioned in sub-clause (1) of rule 6, including domestic and agriculture users of ground water, who have sunk well or boring in his or her premises or agricultural land holdings, shall make, in Form 1(C), an application referred to in sub-section (2) of section 10 or sub-section (2) of section 11 of the Act, within a period of six months from the date of coming into force of these rules, to the Block Panchayat Ground Water Management Committee or Municipal Water Management Committee, as the case may be;	(3) Every existing user of ground water, other than those mentioned in sub-clause (1) of rule 6, including domestic and agriculture users of ground water, who have sunk well or boring in his or her premises or agricultural land holdings, shall make, in Form 1(C), an application referred to in sub-section (2) of section 10 or sub-section (2) of section 11 of Act, within a period of eighteen months from the date of coming into force of these rules, to the Block Panchayat Ground Water Management Committee or Municipal Water Management Committee, as the case may be;

Amendment of rule 20

4. In the said rules, in rule 20 , for sub-rule (1) set out in Column 1 below, the clause as set out in Column 2 shall be *substituted*, namely:-

COLUMN-1	COLUMN-2
Existing sub-rule	*Sub-rule as hereby substituted*
(1) For fixing ground water abstraction limit for all the existing Commercial, Industrial, Infrastructural or Bulk users of ground water, the Ground Water Department, in consultation with stake holders, shall submit a proposal to the State Ground Water Management and Regulatory Authority within six month from the date of commencement of these rules.	(1) For fixing ground water abstraction limit for all the existing Commercial, Industrial, Infrastructural or Bulk users of ground water, the Ground Water Department, in consultation with stake holders, shall submit a proposal to the State Ground Water Management and Regulatory Authority within one year from the date of commencement of these rules.

Amendment of rule 24

5. In the said rules, in rule 24 , for sub-rules (1) and (2) set out in Column 1 below, the sub-rules as set out in Column 2 shall be substituted, namely:-

COLUMN-1	COLUMN-2
Existing sub-rules	*Sub-rules as hereby substituted*
(1) The State Ground Water Management and Regulatory Authority shall ensure through District Ground Water Management Councils that all Commercial, Industrial, Infrastructural or Bulk user of ground water that pollute ground water or surface water, will install treatment plants within a period of one year from the date of commencement of these rules.	(1) The State Ground Water Management and Regulatory Authority shall ensure through District Ground Water Management Councils that all Commercial, Industrial, Infrastructural or Bulk users of ground water that pollute ground water or surface water, will install treatment plants within a period of two years from the date of commencement of these rules.
(2) Each District Ground Water Management Council shall conduct physical verification of all Industries in the district thereof, within two months from the date of commencement of these rules.	(2) Each District Ground Water Management Council shall conduct physical verification of all Industries in the district thereof, within a period of one year from the date of commencement of these rules.

Amendment of rule 25

6. In the said rules, in rule 25 , for sub-rule (2) set out in Column 1 below, the sub-rule as set out in Column 2 shall be substituted, namely:-

COLUMN-1	COLUMN-2

	Existing sub-rule	*Sub-rule as hereby substituted*
	(2) Each District Ground Water Management Council shall conduct physical verification for process of effluent discharge adopted by such Government bodies as provided under sub rule (1), within two months from the date of commencement of these rules.	(2) Each District Ground Water Management Council shall conduct physical verification for process of effluent discharge adopted by such Government bodies as provided under sub rule (1), within a period of one year from the date of commencement of these rules.

Amendment of rule 26

7. In the said rules, in rule 26 , for sub-rule (2) set out in Column 1 below, the sub-rule as set out in Column 2 shall be substituted, namely:-

COLUMN-1	COLUMN-2
Existing sub-rule	*Sub-rule as hereby substituted*
(2) In first phase, every Government Department/ Semi-Government Department/ Authorities/ Aided Institutions/ Public Sector Undertaking (either fully or partially funded by Government), Private Institutions or Organizations, having plot area of 300 square meters or more, or who are extracting ground water through submersible pumps or similar devices, shall also ensure that Rain Water Harvesting Structures have been properly constructed in their premises within one year of date of commencement of Act.	(2) In first phase, every Government Department/ Semi-Government .Department/ Authorities/ Aided Institutions/ Public Sector Undertaking (either fully or partially funded by Government), Private Institutions or Organizations, having plot area of 300 square meters or more, or who are extracting ground water through submersible pumps or similar devices, shall also ensure that Rain Water Harvesting Structures have been properly constructed in their premises within a period of two years from the date of commencement of the Act.

(Anurag Srivastava)
Principal secretary

R-14

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ANNEXURE-R-14

(Colly)

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL IN NON-NOTIFIED AREA

विद्यमान कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	PLBH0621NIN0004
Application Date आवेदन तिथि		06/06/2021	
Name of the Applicant आवेदक का नाम	ASHOK KUMAR MEHTA		
Mobile No. मोबाइल नंबर	9720012951	**Email ID.** ईमेल आईडी	ehsbepl.brk@bajajenergy.com
Date of Birth जन्मतिथि	02/01/1968	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3003-8079-2080	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Ltd, VIllage-Barkhera, District - Pilibhit		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	PILIBHIT	**State** राज्य	Uttar Pradesh
District जनपद	PILIBHIT	**Pin Code** पिन कोड	262203
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village- Barkhera, Tehsil-Bisalpur, Dist- Pilibhi	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Pilibhit	**Block** ब्लॉक	BISALPUR

Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	N/A	Municipality/Municipal Corporation नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	N/A	Uploaded Land Details अपलोड किया गया भूमि का विवरण	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	01/10/2010	Type of the Well कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	Approx. Length of Housing Pipe (In Meter) हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	24.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	Material of the Housing Pipe & Blank Pipe हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	Number of Strainer(s) स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	121.95	Whether there has been Any Adverse Report Regarding Water Quality of the Well? क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Existing Pumping Device
विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	Pump Capacity (In m3/hr) पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	Date of Energization विद्युतीकरण तिथि	01/11/2010

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	5400.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	18.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of Industrial effluents and STP is installed for domestic effluents .All treated water is utilized within plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	na
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download

Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)	48600.00
Does industry come under MSME ? क्या उद्योग MSME के अंतर्गत आता है ?	No

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL IN NON-NOTIFIED AREA

विद्यमान कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	PLBH0621NIN0005
Application Date आवेदन तिथि		06/06/2021	
Name of the Applicant आवेदक का नाम	ASHOK KUMAR MEHTA		
Mobile No. मोबाइल नंबर	9720012951	**Email ID.** ईमेल आईडी	ehsbepl.brk@bajajenergy.com
Date of Birth जन्मतिथि	02/01/1968	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3003-8079-2080	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Ltd, Village-Barkhera, District - Pilibhit		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	PILIBHIT	**State** राज्य	Uttar Pradesh
District जनपद	PILIBHIT	**Pin Code** पिन कोड	262203
Designation पद	Unit head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Bajaj Energy Ltd, Village-Barkhera, District - Pil	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Pilibhit	**Block** ब्लॉक	BISALPUR

Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	N/A	Municipality/Municipal Corporation नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	N/A	Uploaded Land Details अपलोड किया गया भूमि का विवरण	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	01/10/2010	Type of the Well कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	Approx. Length of Housing Pipe (In Meter) हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	24.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	Material of the Housing Pipe & Blank Pipe हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	Number of Strainer(s) स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	121.95	Whether there has been Any Adverse Report Regarding Water Quality of the Well? क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Existing Pumping Device
विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	Pump Capacity (In m3/hr) पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	Date of Energization विद्युतीकरण तिथि	01/11/2010

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	4200.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	14.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of Industrial effluents and STP is installed for domestic effluents .All treated water is utilized within plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	NA
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download

Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	37800.00
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF PROPOSED WELL IN NON-NOTIFIED AREA

प्रस्तावित कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	PLBH0621NIN0006
Application Date आवेदन तिथि		06/06/2021	
Name of the Applicant आवेदक का नाम	ASHOK KUMAR MEHTA		
Mobile No. मोबाइल नंबर	9720012951	**Email ID.** ईमेल आईडी	ehsbepl.brk@bajajenergy.com
Date of Birth जन्मतिथि	02/01/1968	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3003-8079-2080	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Ltd, VIllage-Barkhera, District - Pilibhit		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	PILIBHIT	**State** राज्य	Uttar Pradesh
District जनपद	PILIBHIT	**Pin Code** पिन कोड	262203
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Barkhera ,Tehil - Bisalpur ,Distt - Pilib	**Authorization Letter** प्राधिकार पत्र	Download

Details of Proposed Well
प्रस्तावित कूप का विवरण

District जनपद	Pilibhit	**Block** ब्लॉक	BISALPUR

Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	N/A	Municipality/Municipal Corporation नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	N/A	Uploaded Land Details अपलोड किया गया भूमि का विवरण	Download

Particulars of The Proposed Well
प्रस्तावित कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	06/06/2021	Type of the Well कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	Approx. Length of Housing Pipe (In Meter) हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	24.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	Material of the Housing Pipe & Blank Pipe हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	Number of Strainer(s) स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	121.95	Whether there has been Any Adverse Report Regarding Water Quality of the Well? क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Proposed Pumping Device
प्रस्तावित पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	Pump Capacity (In m3/hr) पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	Date of Energization विद्युतीकरण तिथि	01/01/2021

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Proposed Well **प्रस्तावित कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	2100.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	7.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of Industrial effluents and STP is installed for domestic effluents .All treated water is utilized within plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	na
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download

Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)	189000.00
Does industry come under MSME ? क्या उद्योग MSME के अंतर्गत आता है ?	No

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
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- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC022872

VALID FROM 23/06/2021 TO 22/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000095

Name of the Owner	ASHOK KUMAR MEHTA		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village- Barkhera, Tehsil- Bisalpur, Dist- Pilibhi	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Bajaj Energy Ltd, Village- Barkhera, District - Pilibhit	**Application No.**	PLBH0621NIN0004
Date of Submission	05/06/2021	**Specimen Signature**	

Location Particulars

District	Pilibhit	**Block**	BISALPUR
Plot No./Khasra No.	N/A	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2010	

Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water:	972000	**Recharge Required**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form within the given time period.

GENERAL CONDITIONS:

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- All Users abstracting ground water in excess of 100 m3/d shall be required to submit impact assessment report prepared by an accredited consultant from CGWA and National Accreditation Board for Education and Training (NABET). The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc. within three months of completion of the same to Ground Water Department Uttar Pradesh. The list of accredited Individuals/ Institutions is available on the official web-portal of CGWA.
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.

- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries / Laghu Udyog Bharati certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**30/12/2022**

Place:**Pilibhit**

This certificate is electronically generated and does not require digital signature

Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00
Maximum Allowable Annual Extraction of Ground Water:	756000
Maximum Allowable Running Hours Per Day:	14.00
Recharge Required	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form within the given time period.

GENERAL CONDITIONS:

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- All Users abstracting ground water in excess of 100 m3/d shall be required to submit impact assessment report prepared by an accredited consultant from CGWA and National Accreditation Board for Education and Training (NABET). The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc. within three months of completion of the same to Ground Water Department Uttar Pradesh. The list of accredited Individuals/ Institutions is available on the official web-portal of CGWA.
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.

- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries / Laghu Udyog Bharati certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**30/12/2022**

Place:**Pilibhit**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC039812

VALID FROM 23/06/2021 TO 22/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000101

Name of the Owner	ASHOK KUMAR MEHTA		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Barkhera ,Tehil -Bisalpur ,Distt - Pilib	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Bajaj Energy Ltd, Village- Barkhera, District - Pilibhit	**Application No.**	PLBH0621NIN0006
Date of Submission	05/06/2021	**Specimen Signature**	

Location Particulars

District	Pilibhit	**Block**	BISALPUR
Plot No./Khasra No.	N/A	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Proposed Well and Pumping Device

Date of Construction/Sinking of the Well	06/06/2021		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)		**H.P. of the Pump**	30.00
Type of Pump Used	Submersible	**Rate of Withdrawal (m^3/hr.)**	180.00
Operational Device	Electric Motor		
Date of Energization (In Case of Electric Pump)		01/01/2021	

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC017141

VALID FROM 23/06/2021 TO 22/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000100

Name of the Owner	ASHOK KUMAR MEHTA		
Designation पद	Unit head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Bajaj Energy Ltd, Village-Barkhera, District - Pil	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Bajaj Energy Ltd, Village- Barkhera, District - Pilibhit	**Application No.**	PLBH0621NIN0005
Date of Submission	05/06/2021	**Specimen Signature**	

Location Particulars

District	Pilibhit	**Block**	BISALPUR
Plot No./Khasra No.	N/A	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2010	

Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:	378000	**Recharge Required**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form within the given time period.

GENERAL CONDITIONS:

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- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well shall not exceed to the recorded rate from water meters
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- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
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- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
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- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries / Laghu Udyog Bharati certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.

- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**30/12/2022**

Place:**Pilibhit**

This certificate is electronically generated and does not require digital signature

R-15

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ANNEXURE-R-15

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(Colly)

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA

अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का युआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	Application Number आवेदन संख्या	SHJP0621RIN0039
Application Date आवेदन तिथि		15/07/2021	
Name of the Applicant आवेदक का नाम	SAMIR KUMAR SABAT		
Mobile No. मोबाइल नंबर	9536908462	Email ID. ईमेल आईडी	rpsingh.mqr@bajajenergy.com
Date of Birth जन्मतिथि	21/05/1962	Gender लिंग	Male
Nationality राष्ट्रीयता	Indian	ID as Address Proof निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	2398-3034-0770	Uploaded Aadhaar Card अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Limited Maqsoodapur	Locality/Village मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	SHAHJAHANPUR	State राज्य	Uttar Pradesh
District जनपद	SHAHJAHANPUR	Pin Code पिन कोड	242042
Designation पद	Unit Head	Company Name कंपनी का नाम	Bajaj Energy Limited Maqsoodapur
Company Address कंपनी का पता	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,	Authorization Letter प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Shahjahanpur	Block ब्लॉक	BUNDA
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	43, 42, 5	Municipality/Municipal Corporation नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	NA	Uploaded Land Details अपलोड किया गया भूमि का विवरण	Download

Uploaded Google / Toposheet Map **अपलोड किया गया कूप का गूगल / टोपोशीट मैप**	Download		

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	28/10/2011	**Type of Well** **कूप का प्रकार**	Tube Well/Boring
Discharge of Tube Well (cum./hr) **ट्यूबवेल का निर्वहन (cum./hr)**	180		
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.00
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	110.00	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Ground Water Level (In meter) **भूजल स्तर (मीटर में)**			

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device **परिचालन उपकरण**	Electric Motor	Date of Energization विद्युतीकरण तिथि	28/10/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well विद्यमान कूप का उद्देश्य?	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	5400.00
Daily Running Hours दैनिक उपयोग (घंटे में)	18.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For	ETP	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution**	Yes

Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**		**Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं**	N/A
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	486000.00		

Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done.
10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/परिवर्तन नहीं किए जाएंगे।। Download

Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		
NOC Issued By: **अनापत्ति प्रमाण पत्र (द्वारा निर्गत)**			
Central Ground Water Authority **केन्द्रीय भूगर्भ जल प्राधिकरण**			Yes
Certificate Number **प्रमाणपत्र संख्या**	CGWAINDProj2018325R	**Issue Date** **निर्गमन तिथि**	19/09/2018
Expiry Date **अंतिम तिथि**	28/08/2021	**Upload Certificate** **प्रमाणपत्र अपलोड करें**	Download
Ground Water Department Uttar Pradesh **भूगर्भ जल विभाग उत्तर प्रदेश सरकार**			No
When N.O.C. is not valid at the date of filling the application **जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है**			
Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	21/06/2021
Any clarification Report		**Reason For Pendency**	
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants.	Download		

Pro-forma for the report is given in Annexure-1.

Reason for renewal of N.O.C. **एन.ओ.सी. के नवीनीकरण का कारण**	Existing NOC validity is from 29.08.2018 to 28.08.2021	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled ..

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/मैं सहमत हूं ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be incorrect at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c)
- (d) Affidavit referred to in item no. 5.
- (e) Affidavit referred to in item no. 7.
- (f) Copy of N.O.C. as referred in item no.3.
- Additional Documents to be submitted with the application
- (I) For Industrial User;
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- (II) For Commercial User:
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA
अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का युआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	SHJP0621RIN0038
Application Date आवेदन तिथि		15/07/2021	
Name of the Applicant आवेदक का नाम	SAMIR KUMAR SABAT		
Mobile No. मोबाइल नंबर	9536908462	**Email ID.** ईमेल आईडी	rpsingh.mqr@bajajenergy.com
Date of Birth जन्मतिथि	21/05/1962	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	2398-3034-0770	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Limited Maqsoodapur	**Locality/Village** मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	SHAHJAHANPUR	**State** राज्य	Uttar Pradesh
District जनपद	SHAHJAHANPUR	**Pin Code** पिन कोड	242042
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Maqsoodapur
Company Address कंपनी का पता	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Shahjahanpur	**Block** ब्लॉक	BUNDA
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	43, 42, 5	**Municipality/Municipal Corporation** नगर पालिक/नगर निगम	No

Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	NA	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	Download
Uploaded Google / Toposheet Map **अपलोड किया गया कूप का गूगल / टोपोशीट मैप**	Download		

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	28/10/2011	**Type of Well** **कूप का प्रकार**	Tube Well/Boring
Discharge of Tube Well (cum./hr) **ट्यूबवेल का निर्वहन (cum./hr)**	180		
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.00
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	110.00	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Ground Water Level (In meter) **भूजल स्तर (मीटर में)**			

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		30.00	
Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	28/10/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	4200.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	14.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है **अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं**	N/A
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०³)**	378000.00		
Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done. **10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/परिवर्तन नहीं किए जाएंगे।।**			Download
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		
NOC Issued By: **अनापत्ति प्रमाण पत्र (द्वारा निर्गत)**			
Central Ground Water Authority **केन्द्रीय भूगर्भ जल प्राधिकरण**			Yes
Certificate Number **प्रमाणपत्र संख्या**	CGWAINDProj2018325R	**Issue Date** **निर्गमन तिथि**	19/08/2018
Expiry Date **अंतिम तिथि**	28/08/2021	**Upload Certificate** **प्रमाणपत्र अपलोड करें**	Download
Ground Water Department Uttar Pradesh **भूगर्भ जल विभाग उत्तर प्रदेश सरकार**			No
When N.O.C. is not valid at the date of filling the application **जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है**			
Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	21/06/2021
Any clarification Report		**Reason For Pendency**	

affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
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Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Existing Certificate validity is from 29.08.20218 to 28.08.2021.	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

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I Agree/मैं सहमत हूं ☒

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- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF PROPOSED WELL IN NON-NOTIFIED AREA
प्रस्तावित कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	SHJP0621NIN0027
Application Date आवेदन तिथि		15/07/2021	
Name of the Applicant आवेदक का नाम	SAMIR KUMAR SABAT		
Mobile No. मोबाइल नंबर	9536908462	**Email ID.** ईमेल आईडी	rpsingh.mqr@bajajenergy.com
Date of Birth जन्मतिथि	21/05/1962	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	2398-3034-0770	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Bajaj Energy Limited Maqsoodapur		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	SHAHJAHANPUR	**State** राज्य	Uttar Pradesh
District जनपद	SHAHJAHANPUR	**Pin Code** पिन कोड	242042
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Maqsoodapur
Company Address कंपनी का पता	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,	**Authorization Letter** प्राधिकार पत्र	Download

Details of Proposed Well
प्रस्तावित कूप का विवरण

District जनपद	Shahjahanpur	**Block** ब्लॉक	BUNDA
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	43, 42, 5	**Municipality/Municipal Corporation** नगर पालिक/नगर निगम	No

Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	NA	**Uploaded Land Details** अपलोड किया गया भूमि का विवरण	Download

Particulars of The Proposed Well
प्रस्तावित कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	16/03/2020	**Type of the Well** कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	**Approx. Length of Housing Pipe (In Meter)** हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	30.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	**Material of the Housing Pipe & Blank Pipe** हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	**Number of Strainer(s)** स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	110.00	**Whether there has been Any Adverse Report Regarding Water Quality of the Well?** क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Proposed Pumping Device
प्रस्तावित पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	**Pump Capacity (In m3/hr)** पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	**Date of Energization** विद्युतीकरण तिथि	16/03/2020

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Proposed Well प्रस्तावित कूप का उद्देश्य?	Industrial	**Annual Running Hours** वार्षिक उपयोग (घंटे में)	2100.00

Daily Running Hours **दैनिक उपयोग (घंटे में)**	7.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	Dear Sir We will submit the same if any additional requirment of ducuments. Regards BELMQR
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	189000.00		
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .
मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं । मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC024099

VALID FROM 21/08/2021 TO 20/08/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000494

Name of the Owner	SAMIR KUMAR SABAT		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Maqsoodapur
Company Address कंपनी का पता	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Bajaj Energy Limited Maqsoodapur	**Application Form Serial No.**	SHJP0621NIN0027
Date of Submission	22/06/2021	**Specimen Signature**	

Location Particulars

District	Shahjahanpur	**Block**	BUNDA
Plot No./Khasra No.	43, 42, 5	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Proposed Well and Pumping Device

Date of Construction/Sinking of the Well	16/03/2020		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		16/03/2020	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:	378000	**Recharge Required**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form within the given time period.

GENERAL CONDITIONS:

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- Guidelines for Installation of Piezometers and their Monitoring

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its

validation.

- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.

SPECIFIC CONDITIONS:

(A) For Industrial User: No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:

- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.

(B) Infrastructural User: The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:

- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**23/09/2022**

Place:**Shahjahanpur**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG014526

VALID FROM 21/08/2021 TO 20/08/2026

Registration No.: 202106000472

Name of the Owner	SAMIR KUMAR SABAT		
Address of the Applicant	Bajaj Energy Limited Maqsoodapur	**Application Form Serial No.**	SHJP0621RIN0039
Date of Submission	21/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Maqsoodapur	**Company Address**	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,

Location Particulars

District	Shahjahanpur	**Block**	BUNDA
Plot No./Khasra No.	43, 42, 5	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	28/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		28/10/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water:	972000	**Recharge Required**	0.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Existing NOC validity is from 29.08.2018 to 28.08.2021		
Against Case			

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) n case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring
- Piezometer is a borewell /tube well used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows for compliance of NOC:
- • The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- • The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- • No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- • The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.
- • For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- • The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- • All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- • A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.

- • Any other site-specific requirement regarding safety and access for measurement may be taken care of.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) **Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

Date :**23/09/2022**

Place:**Shahjahanpur**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG016303

VALID FROM 21/08/2021 TO 20/08/2026

Registration No.: 202106000470

Name of the Owner	SAMIR KUMAR SABAT		
Address of the Applicant	Bajaj Energy Limited Maqsoodapur	**Application Form Serial No.**	SHJP0621RIN0038
Date of Submission	21/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Maqsoodapur	**Company Address**	Village: Maqsoodapur, Block:Banda, Tehsil:Powayan,

Location Particulars

District	Shahjahanpur	**Block**	BUNDA
Plot No./Khasra No.	43, 42, 5	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	28/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		28/10/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:	756000	**Recharge Required**	0.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Existing Certificate validity is from 29.08.20218 to 28.08.2021.		
Against Case			

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
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- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
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Date :**23/09/2022**

Place:**Shahjahanpur**

This certificate is electronically generated and does not require digital signature

ANNEXURE-R-16 (Colly)

28/06/2021 Registration Form

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA
अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का युआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	LMPK0621RIN0033
Application Date आवेदन तिथि		28/06/2021	
Name of the Applicant आवेदक का नाम	DHARMINDER SINGH		
Mobile No. मोबाइल नंबर	7054309142	**Email ID.** ईमेल आईडी	dharminders.kkh@bajajenergy.com
Date of Birth जन्मतिथि	11/11/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3384-5491-9631	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Locality/Village** मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	LAKHIMPUR KHIRI	**State** राज्य	Uttar Pradesh
District जनपद	LAKHIMPUR KHIRI	**Pin Code** पिन कोड	261506
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Lakhimpur Kheri	**Block** ब्लॉक	FULBEHAD

28/06/2021 Registration Form

Plot No./Khasra No. **प्लॉट संख्या/खसरा संख्या**	1068 , 1069	**Municipality/Municipal Corporation** **नगर पालिका/नगर निगम**	No
Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	N/A	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	Download
Uploaded Google / Toposheet Map **अपलोड किया गया कूप का गूगल / टोपोशीट मैप**	Download		

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	15/12/2011	**Type of Well** **कूप का प्रकार**	Tube Well/Boring
Discharge of Tube Well (cum./hr) **ट्यूबवेल का निर्वहन (cum./hr)**	180		
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.00
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	110.00	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Ground Water Level (In meter) **भूजल स्तर (मीटर में)**			

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		25.00	

Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	15/12/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	5400.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	18.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	Effluent Treatment Plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	No	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं**	Borewell1
Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done. **10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/ परिवर्तन नहीं किए जाएंगे।।**			Download
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		

NOC Issued By:
अनापत्ति प्रमाण पत्र (द्वारा निर्गत)

Central Ground Water Authority **केन्द्रीय भूगर्भ जल प्राधिकरण**			Yes
Certificate Number **प्रमाणपत्र संख्या**	21-4(241)/NR/CGWA/2009/1844	**Issue Date** **निर्गमन तिथि**	19/09/2019
Expiry Date **अंतिम तिथि**	28/08/2021	**Upload Certificate** **प्रमाणपत्र अपलोड करें**	Download
Ground Water Department Uttar Pradesh **भूगर्भ जल विभाग उत्तर प्रदेश सरकार**			No

When N.O.C. is not valid at the date of filling the application
जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है

Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	12/06/2021
Any clarification Report		**Reason For Pendency**	

affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled ..
मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/मैं सहमत हूं

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be incorrect at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c)
- (d) Affidavit referred to in item no. 5.
- (e) Affidavit referred to in item no. 7.
- (f) Copy of N.O.C. as referred in item no.3.
- Additional Documents to be submitted with the application
- (I) For Industrial User;
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- (II) For Commercial User:
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA
अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का युआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	LMPK0621R1N0034
Application Date आवेदन तिथि		28/06/2021	
Name of the Applicant आवेदक का नाम	DHARMINDER SINGH		
Mobile No. मोबाइल नंबर	7054309142	**Email ID.** ईमेल आईडी	dharminders.kkh@bajajenergy.com
Date of Birth जन्मतिथि	11/11/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3384-5491-9631	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Locality/Village** मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	LAKHIMPUR KHIRI	**State** राज्य	Uttar Pradesh
District जनपद	LAKHIMPUR KHIRI	**Pin Code** पिन कोड	261506
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Lakhimpur Kheri	**Block** ब्लॉक	FULBEHAD

Plot No./Khasra No. **प्लॉट संख्या/खसरा संख्या**	1068 , 1069	**Municipality/Municipal Corporation** **नगर पालिका/नगर निगम**	No
Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	N/A	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	Download
Uploaded Google / Toposheet Map **अपलोड किया गया कूप का गूगल / टोपोशीट मैप**	Download		

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	15/12/2011	**Type of Well** **कूप का प्रकार**	Tube Well/Boring
Discharge of Tube Well (cum./hr) **ट्यूबवेल का निर्वहन (cum./hr)**	180		
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.00
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	110.00	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Ground Water Level (In meter) **भूजल स्तर (मीटर में)**			

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		25.00	

Operational Device परिचालन उपकरण	Electric Motor	**Date of Energization** विद्युतीकरण तिथि	15/12/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well विद्यमान कूप का उद्देश्य?	Industrial	**Annual Running Hours** वार्षिक उपयोग (घंटे में)	4200.00
Daily Running Hours दैनिक उपयोग (घंटे में)	14.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)	Effluent Treatment Plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं	Yes
Upload NOC अनापत्ति प्रमाणपत्र अपलोड करें	Download	**Length of Section Pipe (in Meter)** सक्शन पाइप की लंबाई (मीटर में)	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?	No	**Any Other Information Which You Would Like to Furnish** कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं	Borewell2
Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done. 10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/ परिवर्तन नहीं किए जाएंगे।।			Download
Does industry come under MSME ? क्या उद्योग MSME के अंतर्गत आता है ?	No		
NOC Issued By: अनापत्ति प्रमाण पत्र (द्वारा निर्गत)			
Central Ground Water Authority केन्द्रीय भूगर्भ जल प्राधिकरण			Yes
Certificate Number प्रमाणपत्र संख्या	21-4(241)/NR/CGWA/2009/1844	**Issue Date** निर्गमन तिथि	19/09/2018
Expiry Date अंतिम तिथि	28/08/2021	**Upload Certificate** प्रमाणपत्र अपलोड करें	Download
Ground Water Department Uttar Pradesh भूगर्भ जल विभाग उत्तर प्रदेश सरकार			No
When N.O.C. is not valid at the date of filling the application जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है			
Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	17/06/2021
Any clarification Report		**Reason For Pendency**	

affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
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Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
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I Agree/मैं सहमत हूं ☐

Note/नोट

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- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c)
- (d) Affidavit referred to in item no. 5.
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- Additional Documents to be submitted with the application
- (I) For Industrial User;
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day.
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- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF PROPOSED WELL IN NON-NOTIFIED AREA
प्रस्तावित कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	LMPK0621NIN0024
Application Date आवेदन तिथि		28/06/2021	
Name of the Applicant आवेदक का नाम	DHARMINDER SINGH		
Mobile No. मोबाइल नंबर	7054309142	**Email ID.** ईमेल आईडी	dharminders.kkh@bajajenergy.com
Date of Birth जन्मतिथि	11/11/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	3384-5491-9631	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	LAKHIMPUR KHIRI	**State** राज्य	Uttar Pradesh
District जनपद	LAKHIMPUR KHIRI	**Pin Code** पिन कोड	261506
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download

Details of Proposed Well
प्रस्तावित कूप का विवरण

District जनपद	Lakhimpur Kheri	**Block** ब्लॉक	FULBEHAD
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	1068 , 1069	**Municipality/Municipal Corporation** नगर पालिक/नगर निगम	No

Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	N/A	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	Download

Particulars of The Proposed Well
प्रस्तावित कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	15/04/2020	**Type of the Well** **कूप का प्रकार**	Tube Well/Boring
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In Meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.00
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	105.42	8.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	110.00	**Whether there has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Give Particulars Regarding Water Quality of the Well **कूप की जलीय गुणवत्ता का विवरण दें**		N/A	

Details of Proposed Pumping Device
प्रस्तावित पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		25.00	
Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	15/04/2020

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Proposed Well **प्रस्तावित कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	2100.00

Daily Running Hours **दैनिक उपयोग (घंटे में)**	7.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	Effluent Treatment Plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	18.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	No	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	Borewell3
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .
मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

11/04/2022, 11:43

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG045173

VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000284

Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621RIN0033
Date of Submission	12/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Unit Khambharkhera	**Company Address**	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	15/12/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/12/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water:			972000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021		

Against Case

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) n case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring
- Piezometer is a borewell /tube well used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows for compliance of NOC:
- • The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- • The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- • No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- • The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.
- • For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- • The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- • All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- • A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- • Any other site-specific requirement regarding safety and access for measurement may be taken care of.
- (11) Any other condition(s) that may be imposed by the concerned Authority.

- (12) In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) **Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

Date :**07/04/2022**

Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

11/04/2022, 11:44

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG012934

VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000377

Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621RIN0034
Date of Submission	17/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Unit Khambharkhera	**Company Address**	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	15/12/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/12/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021		

Against Case

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) n case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring
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- • The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- • No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- • The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.
- • For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- • The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- • All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- • A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- • Any other site-specific requirement regarding safety and access for measurement may be taken care of.
- (11) Any other condition(s) that may be imposed by the concerned Authority.

- (12) In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) **Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

Date :**07/04/2022**

Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

11/04/2022, 11:41

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020026

VALID FROM 25/07/2021 TO 24/07/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000500

Name of the Owner	DHARMINDER SINGH		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621NIN0024
Date of Submission	23/06/2021	**Specimen Signature**	

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Proposed Well and Pumping Device

Date of Construction/Sinking of the Well	15/04/2020		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

11/04/2022, 11:41

Date of Energization (In Case of Electric Pump)		15/04/2020	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:			378000.00

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.

- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.

- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.

- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**07/04/2022**

Place:**Lakhimpur Kheri**

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ANNEXURE-R-17

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GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL IN NON-NOTIFIED AREA

विद्यमान कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	GNDA0621NIN0008
Application Date आवेदन तिथि		04/06/2021	
Name of the Applicant आवेदक का नाम	PRASHANT KUMAR JENA		
Mobile No. मोबाइल नंबर	9721108555	**Email ID.** ईमेल आईडी	pkjena.kdk@bajajenergy.com
Date of Birth जन्मतिथि	28/05/1972	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	
Other ID Number	AEZPJ4250L	**Uploaded Other ID** अपलोड किया गया	
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Village - Kundarkhi ,PO - Govindpara		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	GONDA	**State** राज्य	Uttar Pradesh
District जनपद	GONDA	**Pin Code** पिन कोड	271301
Designation पद	Senior Manager	**Company Name** कंपनी का नाम	Bajaj Energy Limited, Unit Kundarkhi
Company Address कंपनी का पता	Village - Kundarkhi,PO - Govindpara,District - Gon	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Gonda	**Block** ब्लॉक	JHANJHARI

Plot No./Khasra No. **प्लॉट संख्या/खसरा संख्या**	6,7,8,62,63,65,546 &548	**Municipality/Municipal Corporation** **नगर पालिक/नगर निगम**	N/A
Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	N/A	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	03/03/2011	**Type of the Well** **कूप का प्रकार**	Tube Well/Boring
Housing Pipe If Any यदि कोई है		No	

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.40	100.42	3.02	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	106.57	**Whether there has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Give Particulars Regarding Water Quality of the Well **कूप की जलीय गुणवत्ता का विवरण दें**		N/A	

Details of Existing Pumping Device
विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		30.00	
Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	03/03/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	5700.00

Daily Running Hours **दैनिक उपयोग (घंटे में)**	19.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of Industrial effluents and STP is installed for domestic effluents .All treated water is utilized within plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	N/A
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		

Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	513000.00
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं। मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL IN NON-NOTIFIED AREA

विद्यमान कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	GNDA0621NIN0009
Application Date आवेदन तिथि		04/06/2021	
Name of the Applicant आवेदक का नाम	PRASHANT KUMAR JENA		
Mobile No. मोबाइल नंबर	9721108555	**Email ID.** ईमेल आईडी	pkjena.kdk@bajajenergy.com
Date of Birth जन्मतिथि	28/05/1972	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Driving License
Driving License Number	UP432017000845	**Uploaded Driving License** अपलोड किया गया ड्राइविंग लाइसेंस	
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Village - Kundarkhi ,PO - Govindpara		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	GONDA	**State** राज्य	Uttar Pradesh
District जनपद	GONDA	**Pin Code** पिन कोड	271301
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhi ,Post _ Govindpara ,Distt - Go	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Gonda	**Block** ब्लॉक	JHANJHARI
Plot No./Khasra No.	N/A	**Municipality/Municipal**	No

प्लॉट संख्या/खसरा संख्या		**Corporation** **नगर पालिक/नगर निगम**	
Ward No./Holding No. **वॉर्ड संख्या/होल्डिंग संख्या**	N/A	**Uploaded Land Details** **अपलोड किया गया भूमि का विवरण**	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	10/01/2012	**Type of the Well** **कूप का प्रकार**	Tube Well/Boring
Housing Pipe If Any **यदि कोई है**		No	

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Galvanized Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	106.57	**Whether there has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Give Particulars Regarding Water Quality of the Well **कूप की जलीय गुणवत्ता का विवरण दें**		N/A	

Details of Existing Pumping Device
विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m3/hr)** **पंप क्षमता (m3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**		30.00	
Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	10/01/2012

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	4200.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	14.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of industrial effluent and STP is installed for Domestic Effluent. Entire treated water is used in gardening horticulture	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?**	Yes

	dust suppression coal quenching etc	कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं	
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	**na**
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**		378000.00	
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.

- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL IN NON-NOTIFIED AREA

विद्यमान कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	GNDA0621NIN0010
Application Date आवेदन तिथि		04/06/2021	
Name of the Applicant आवेदक का नाम	PRASHANT KUMAR JENA		
Mobile No. मोबाइल नंबर	9721108555	**Email ID.** ईमेल आईडी	pkjena.kdk@bajajenergy.com
Date of Birth जन्मतिथि	28/05/1972	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Driving License
Driving License Number	UP432017000845	**Uploaded Driving License** अपलोड किया गया ड्राइविंग लाइसेंस	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Village - Kundarkhi ,PO - Govindpara		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	GONDA	**State** राज्य	Uttar Pradesh
District जनपद	GONDA	**Pin Code** पिन कोड	271301
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhi ,Post _ Govindpara ,Distt - Go	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Gonda	**Block** ब्लॉक	JHANJHARI

Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	NA	Municipality/Municipal Corporation नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	N/A	Uploaded Land Details अपलोड किया गया भूमि का विवरण	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	10/01/2012	Type of the Well कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	Approx. Length of Housing Pipe (In Meter) हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	24.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	Material of the Housing Pipe & Blank Pipe हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Galvanized Iron	Number of Strainer(s) स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	106.57	Whether there has been Any Adverse Report Regarding Water Quality of the Well? क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Existing Pumping Device
विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	Pump Capacity (In m3/hr) पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	Date of Energization विद्युतीकरण तिथि	10/01/2012

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial	**Annual Running Hours** **वार्षिक उपयोग (घंटे में)**	2100.00
Daily Running Hours **दैनिक उपयोग (घंटे में)**	7.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been installed for the treatment of industrial effluent and STP is installed for Domestic Effluent. Entire treated water is used in gardening horticulture dust suppression coal quenching etc	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	na
affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download

Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)	189000.00
Does industry come under MSME ? क्या उद्योग MSME के अंतर्गत आता है ?	No

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

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I Agree/सहमत ☑

Note/नोट

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- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
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- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
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- **Additional Documents to be submitted with the application**
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- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
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- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020081

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202101000137

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Senior Manager	**Company Name** कंपनी का नाम	Bajaj Energy Limited, Unit Kundarkhi
Company Address कंपनी का पता	Village - Kundarkhi,PO - Govindpara,District - Gon	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0008
Date of Submission	07/01/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	6,7,8,62,63,65,546 &548	**Municipality/Corporation**	N/A
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	03/03/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00

Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		03/03/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	19.00
Maximum Allowable Annual Extraction of Ground Water:			1026000.00

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November)

periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**02/08/2022**

Place:**Gonda**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC033164

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000066

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Unit Head	**Company Name कंपनी का नाम**	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhi ,Post _ Govindpara ,Distt - Go	**Authorization Letter प्राधिकार पत्र**	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0009
Date of Submission	04/06/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	N/A	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	10/01/2012		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		10/01/2012	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000.00

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November)

periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**02/08/2022**

Place:**Gonda**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC027710

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000067

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhi ,Post _ Govindpara ,Distt - Go	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0010
Date of Submission	04/06/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	NA	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	10/01/2012		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		10/01/2012	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:			378000.00

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

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- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November)

periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.

- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**02/08/2022**

Place:**Gonda**

This certificate is electronically generated and does not require digital signature

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ANNEXURE-R-18

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(Colly)

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA
अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का यूआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	BLMP0821RIN0018
Application Date आवेदन तिथि		16/08/2021	
Name of the Applicant आवेदक का नाम	NISHANT SRIVASTAVA		
Mobile No. मोबाइल नंबर	6389212566	**Email ID.** ईमेल आईडी	prabhakargoyal55@gmail.com
Date of Birth जन्मतिथि	08/09/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	7064-9253-5037	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ्लैट सं0/भवन सं0	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	**Locality/Village** मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	BALRAMPUR	**State** राज्य	Uttar Pradesh
District जनपद	BALRAMPUR	**Pin Code** पिन कोड	271607
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Ltd
Company Address कंपनी का पता	Village-Itai Maida,Post-Sriduttaganj,Utraula,Balra	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Balrampur	**Block** ब्लॉक	Sridattganj
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	228M	**Municipality/Municipal Corporation** नगर पालिक/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	NA	**Uploaded Land Details** अपलोड किया गया भूमि का विवरण	Download

Uploaded Google / Toposheet Map **अपलोड किया गया कूप का गूगल / टोपोशीट मैप**	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well **कूप की निर्माण तिथि**	01/10/2011	**Type of Well** **कूप का प्रकार**	Tube Well/Boring
Discharge of Tube Well (cum./hr) **ट्यूबवेल का निर्वहन (cum./hr)**	180		
Housing Pipe If Any **यदि कोई है**	Yes	**Approx. Length of Housing Pipe (In meter)** **हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)**	30.50
Approx. Diameter of Housing Pipe (mm) **हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)**	400.00	**Material of the Housing Pipe & Blank Pipe** **हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री**	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer **स्ट्रेनर की सामग्री**	Iron	**Number of Strainer(s)** **स्ट्रेनर की संख्या**	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) **कूप की अनुमानित गहराई (मीटर में)**	121.95	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** **क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?**	No
Ground Water Level (In meter) **भूजल स्तर (मीटर में)**	2.00		

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used **प्रयोग किये जाने वाले पंप का प्रकार**	Submersible	**Pump Capacity (In m^3/hr)** **पंप क्षमता (m^3/hr)**	180.00
Horse Power (H.P.) **हॉर्स पावर (एच.पी.)**	30.00	**Length of Suction Pipe (In meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Operational Device **परिचालन उपकरण**	Electric Motor	**Date of Energization** **विद्युतीकरण तिथि**	01/11/2011

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well **विद्यमान कूप का उद्देश्य?**	Industrial

Annual Running Hours **वार्षिक उपयोग (घंटे में)**	5400.00	**Annual Days** **वार्षिक उपयोग (दिनों में)**	300
Daily Running Hours **दैनिक उपयोग (घंटे में)**	18.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been instaklled for the treatment of industrial effluents and STOP is installed for domestic weffluents.All treated water is utilized with in plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं**	N/A
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	486000.00		
Maximum Allowable Annual Extraction of Ground Water:			972000
Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done. **10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/ परिवर्तन नहीं किए जाएंगे।।**			Download
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		
NOC Issued By: **अनापत्ति प्रमाण पत्र (द्वारा निर्गत)**			
Central Ground Water Authority **केन्द्रीय भूगर्भ जल प्राधिकरण**			Yes
Certificate Number **प्रमाणपत्र संख्या**	214243NRCGWA2020091841	**Issue Date** **निर्गमन तिथि**	19/09/2018
Expiry Date **अंतिम तिथि**	28/08/2021	**Upload Certificate** **प्रमाणपत्र अपलोड करें**	Download
Ground Water Department Uttar Pradesh **भूगर्भ जल विभाग उत्तर प्रदेश सरकार**			No
When N.O.C. is not valid at the date of filling the application **जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है**			
Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	11/08/2021
Any clarification Report		**Reason For Pendency**	

affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m^3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	CGWA NOC valid till 28.08.2021	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled ..

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/मैं सहमत हूं ☑

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be incorrect at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c)
- (d) Affidavit referred to in item no. 5.
- (e) Affidavit referred to in item no. 7.
- (f) Copy of N.O.C. as referred in item no.3.
- Additional Documents to be submitted with the application
- (I) For Industrial User;
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m^3/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- (II) For Commercial User:
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (B)

[See rule 14(1)]

APPLICATION FOR RENEWAL OF NO-OBJECTION CERTIFICATE FOR SINKING OF WELL FOR ANY COMMERCIAL OR INDUSTRIAL OR INFRASTRUCTURAL OR BULK USER IN NOTIFIED AND NON-NOTIFIED AREA

अनापत्ति प्रमाण पत्र के नवीनीकरण का आवेदन पत्र

[UIS 10(1) or 11(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]
[उत्तर प्रदेश भूगर्भ जल प्रबंधन और विनियमन अधिनियम, 2019 का यूआईएस 10 (1) या 11 (1)]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	BLMP0821RIN0017
Application Date आवेदन तिथि		16/08/2021	
Name of the Applicant आवेदक का नाम	NISHANT SRIVASTAVA		
Mobile No. मोबाइल नंबर	6389212566	**Email ID.** ईमेल आईडी	prabhakargoyal55@gmail.com
Date of Birth जन्मतिथि	08/09/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	7064-9253-5037	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	**Locality/Village** मुहल्ला/गाँव	
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	BALRAMPUR	**State** राज्य	Uttar Pradesh
District जनपद	BALRAMPUR	**Pin Code** पिन कोड	271607
Designation पद	UNIT HEAD	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Itaimaida ,PO - Sriduttganj , Utraula Di	**Authorization Letter** प्राधिकार पत्र	Download

Details of Existing Well
विद्यमान कूप का विवरण

District जनपद	Balrampur	**Block** ब्लॉक	Sridattganj
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	NA	**Municipality/Municipal Corporation** नगर पालिका/नगर निगम	No
Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	NA	**Uploaded Land Details** अपलोड किया गया भूमि का विवरण	Download

Uploaded Google / Toposheet Map अपलोड किया गया कूप का गूगल / टोपोशीट मैप	Download

Particulars of The Existing Well
विद्यमान कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	01/10/2010	**Type of Well** कूप का प्रकार	Tube Well/Boring
Discharge of Tube Well (cum./hr) ट्यूबवेल का निर्वहन (cum./hr)	24		
Housing Pipe If Any यदि कोई है	Yes	**Approx. Length of Housing Pipe (In meter)** हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	30.52
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	**Material of the Housing Pipe & Blank Pipe** हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	**Number of Strainer(s)** स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	121.95	**Whether There has been Any Adverse Report Regarding Water Quality of the Well?** क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Ground Water Level (In meter) भूजल स्तर (मीटर में)	4.00		

Details of Existing Pumping Device विद्यमान पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	**Pump Capacity (In m^3/hr)** पंप क्षमता (m^3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)	30.00	**Length of Suction Pipe (In meter)** सक्शन पाइप की लंबाई (मीटर में)	24.00
Operational Device परिचालन उपकरण	Electric Motor	**Date of Energization** विद्युतीकरण तिथि	01/11/2010

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Existing Well विद्यमान कूप का उद्देश्य?	Industrial

Annual Running Hours **वार्षिक उपयोग (घंटे में)**	4200.00	**Annual Days** **वार्षिक उपयोग (दिनों में)**	300
Daily Running Hours **दैनिक उपयोग (घंटे में)**	14.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Please Submit Mode of Treatment of Waste Water/Effluent (For Industries) **अपशिष्ट जल की उपचार प्रणाली भरें (उद्योग हेतु)**	ETP has been instakiled for the treatment of industrial effluents and STOP is installed for domestic wefffluents.All treated water is utilized with in plant	**Please Mention Whether Obtained NOC from Uttar Pradesh Pollution Control Board for Discharge of Effluent/Waste Water or Not?** **कृपया उल्लेख करें कि क्या उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड से अपशिष्ट प्रवाह/ अपशिष्ट जल प्रवाह हेतु अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है अथवा नहीं**	Yes
Upload NOC **अनापत्ति प्रमाणपत्र अपलोड करें**	Download	**Length of Section Pipe (in Meter)** **सक्शन पाइप की लंबाई (मीटर में)**	24.00
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	Yes	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं**	N/A
Capacity of Structure, Constructed for Rain Water Harvesting (M^3) **वर्षा जल के संचयन हेतु निर्मित संरचना की क्षमता (मी०^3)**	378000.00		
Maximum Allowable Annual Extraction of Ground Water:			756000
Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done. **10 रुपये के न्यायिकेतर स्टाम्प पेपर पर शपथ पत्र प्रस्तुत करने के निर्देश दिये जाते हैं जिसपर यह उल्लिखित हो कि अनापत्ति प्रमाणपत्र प्राप्त करने हेतु भरे गए आवेदन पत्र पर प्रदान की गई जानकारी के विरुद्ध आवेदक द्वारा कूप में किसी प्रकार के बदलाव/ परिवर्तन नहीं किए जाएंगे।।**			Download
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		
NOC Issued By: **अनापत्ति प्रमाण पत्र (द्वारा निर्गत)**			
Central Ground Water Authority **केन्द्रीय भूगर्भ जल प्राधिकरण**			Yes
Certificate Number **प्रमाणपत्र संख्या**	CGWA2018324R	**Issue Date** **निर्गमन तिथि**	19/09/2018
Expiry Date **अंतिम तिथि**	28/08/2021	**Upload Certificate** **प्रमाणपत्र अपलोड करें**	Download
Ground Water Department Uttar Pradesh **भूगर्भ जल विभाग उत्तर प्रदेश सरकार**			No
When N.O.C. is not valid at the date of filling the application **जब अनापत्ति प्रमाण पत्र आवेदन भरने की तिथि में मान्य नहीं है**			
Date of Expiry of N.O.C	28/08/2021	**Date of filling application for renewal**	05/08/2021
Any clarification Report		**Reason For Pendency**	

affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day	Download	**Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m^3/day**	Download
Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories	Download	**Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs**	Download
Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.	Download		
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	cgwa noc valid upto 28082021	**Affidavit on non judicial stamp paper of Rs, 10 that no alteration/ modification of well against the details submitted at the time of filling up application for grant of N.O.C. will be done**	Download
Against Case	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled ..

मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/मैं सहमत हूं

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be incorrect at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c)
- (d) Affidavit referred to in item no. 5.
- (e) Affidavit referred to in item no. 7.
- (f) Copy of N.O.C. as referred in item no.3.
- Additional Documents to be submitted with the application
- (I) For Industrial User;
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 m^3/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10m^3/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m^3/day in Over-exploited, Critical and Semi-critical areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- (II) For Commercial User:
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by an accredited consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
- (d) Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.
- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- 7. The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (A)/फॉर्म 8 (ए)

APPLICATION FOR OBTAINING GRANT OF AUTHORIZATION/NO OBJECTION CERTIFICATE FOR SINKING OF PROPOSED WELL IN NON-NOTIFIED AREA
प्रस्तावित कूप की बोरिंग हेतु प्राधिकार/अनापत्ति प्रमाणपत्र प्राप्त करने के लिए आवेदन

(Any Commercial or Industrial or Infrastructural or Bulk user)
(वाणिज्यिक अथवा औद्योगिक अथवा अवसंरचनात्मक अथवा सामूहिक उपयोक्ता)

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Bill, 2019]
[धारा 14, उत्तर प्रदेश भूगर्भ जल प्रबंधन तथा विनियमन बिल, 2019 के अधीन]

Applicant's Details
आवेदक का विवरण

Type of Applicant आवेदक का प्रकार	Behalf of Firm/Company	**Application Number** आवेदन संख्या	BLMP0721NCO0001
Application Date आवेदन तिथि		01/07/2021	
Name of the Applicant आवेदक का नाम	NISHANT SRIVASTAVA		
Mobile No. मोबाइल नंबर	6389212566	**Email ID.** ईमेल आईडी	prabhakargoyal55@gmail.com
Date of Birth जन्मतिथि	08/09/1979	**Gender** लिंग	Male
Nationality राष्ट्रीयता	Indian	**ID as Address Proof** निवास प्रमाण हेतु आईडी	Aadhaar Card
Aadhaar Card Number	7064-9253-5037	**Uploaded Aadhaar Card** अपलोड किया गया आधार कार्ड	Download
House No./Flat No./Building No. मकान सं0/फ़्लैट सं0/भवन सं0	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP		
City/Town/Post Office नगर/कस्बा/पोस्ट ऑफिस	BALRAMPUR	**State** राज्य	Uttar Pradesh
District जनपद	BALRAMPUR	**Pin Code** पिन कोड	271607
Designation पद	Unit Head	**Company Name** कंपनी का नाम	M/s Bajaj Energy LTD.
Company Address कंपनी का पता	Village-Itai Maida,Post-Sriduttaganj,Utraula,Balra	**Authorization Letter** प्राधिकार पत्र	Download

Details of Proposed Well
प्रस्तावित कूप का विवरण

District जनपद	Balrampur	**Block** ब्लॉक	Sridattganj
Plot No./Khasra No. प्लॉट संख्या/खसरा संख्या	228	**Municipality/Municipal Corporation** नगर पालिक/नगर निगम	No

Ward No./Holding No. वॉर्ड संख्या/होल्डिंग संख्या	NA	**Uploaded Land Details** अपलोड किया गया भूमि का विवरण	Download

Particulars of The Proposed Well
प्रस्तावित कूप का ब्यौरा

Date of Construction/Sinking of Well कूप की निर्माण तिथि	15/04/2020	**Type of the Well** कूप का प्रकार	Tube Well/Boring
Housing Pipe If Any यदि कोई है	Yes	**Approx. Length of Housing Pipe (In Meter)** हाउसिंग पाईप की अनुमानित लंबाई (मीटर में)	24.00
Approx. Diameter of Housing Pipe (mm) हाउसिंग पाईप का अनुमानित व्यास (मिलीमीटर में)	400.00	**Material of the Housing Pipe & Blank Pipe** हाउसिंग पाईप एवं ब्लैंक पाईप की सामग्री	Iron

Strainer Details
स्ट्रेनर का विवरण

Material of Strainer स्ट्रेनर की सामग्री	Iron	**Number of Strainer(s)** स्ट्रेनर की संख्या	2

S.No. क्रम संख्या	Strainer Installed at what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई पर स्थापित है (मीटर में)	Strainer Installed upto what Depth from Ground Level (in Meter) स्ट्रेनर, भू-स्तर से कितनी गहराई तक स्थापित है (मीटर में)	Length (In meter) लंबाई (मीटर में)	Diameter (In millimeter) व्यास (मिलीमीटर में)
1	61.27	88.27	27.00	250.00
2	97.42	100.42	3.00	250.00

Approx. Depth of Well (In meter) कूप की अनुमानित गहराई (मीटर में)	121.95	**Whether there has been Any Adverse Report Regarding Water Quality of the Well?** क्या कूप के जल की गुणवत्ता के संबंध में कोई प्रतिकूल रिपोर्ट है?	No
Give Particulars Regarding Water Quality of the Well कूप की जलीय गुणवत्ता का विवरण दें		N/A	

Details of Proposed Pumping Device
प्रस्तावित पंपिंग उपकरण का विवरण

Type of Pump to be Used प्रयोग किये जाने वाले पंप का प्रकार	Submersible	**Pump Capacity (In m3/hr)** पंप क्षमता (m3/hr)	180.00
Horse Power (H.P.) हॉर्स पावर (एच.पी.)		30.00	
Operational Device परिचालन उपकरण	Electric Motor	**Date of Energization** विद्युतीकरण तिथि	15/04/2020

Details of Utilization of Well
कूप के उपयोग का विवरण

Purpose of the Proposed Well प्रस्तावित कूप का उद्देश्य?	Commercial	**Annual Running Hours** वार्षिक उपयोग (घंटे में)	2100.00

Daily Running Hours **दैनिक उपयोग (घंटे में)**	7.00	**Whether the Water Supplied in Well Area Through Pipe Water Supply or Not?** **क्या क्षेत्र में जल की आपूर्ति पाइप जलापूर्ति के माध्यम से होती है?**	No
Whether Rain Water Harvesting Structure has been Constructed within the Premises? **क्या परिसर में वर्षा जल संचयन संरचना का निर्माण किया गया है?**	No	**Any Other Information Which You Would Like to Furnish** **कोई अन्य जानकारी जो आप प्रदान करना चाहते हैं:**	No
In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.	Download	**Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.**	Download
Certificate of non-availability of water from local government water supply agency in respect of all categories of assessments units for commercial use.	Download	**Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.**	Download
Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).	Download	**An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.**	Download
Does industry come under MSME ? **क्या उद्योग MSME के अंतर्गत आता है ?**	No		

Declaration by the Applicant
आवेदक द्वारा उद्घोषणा

I do hereby declare that the particulars fuenished herein above are correct and true . I understand that in case any of the information and particulars is found to be incorrect at any stage of scrutiny and investigation or thereafter, my application/registration is liable to be rejected/cancelled .
मैं एतद्द्वारा घोषित करता हूँ कि ऊपर दिये गए विवरण सही व सत्य हैं | मैं जानता हूँ कि यदि जांच पड़ताल के दौरान किसी भी स्तर पर उपरोक्त विवरण असत्य पाये गए तो मेरा आवेदन/रजिस्ट्रीकरण अस्वीकृत/निरस्त किए जाने योग्य होगा"

I Agree/सहमत

Note/नोट

- Separate application form should be used for registration of each individual well.
- The application form should be completed in all respect before submission. Incomplete applications are liable for rejection. Any correction I alteration shall be duly authenticated.
- In case any of the particulars/information is found to be incorrect at any stage of verification I scrutiny, the application is liable for rejection.
- In case any of the particulars/ information furnished is found to be in correct at any stage even after issue of the AUTHORIZATION/ NO_OBJECTION CERTIFICATE FOR SINKING OF NEW WELL, same shall be liable for cancellation.
- Please write 'N.A.' against those items which are not applicable.
- Please attach the following documents along with the application:
- (a) Document showing proof of ownership of land;
- (b) Photocopy of Aadhaar card / voter ID I ration card I any other proof of identification
- (c) Map showing location of the proposed well, which have been referred to in item no.2(a), (b)and(c).
- (d) Affidavit referred to in item no. 7(i) or 7(ii), as the case may be (if required)
- **Additional Documents to be submitted with the application**
- **(I) For Industrial User**
- (a) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water supply from local government agencies in cases where ground water requirement is up to 10 cubic meter/day.
- (b) Certificate regarding non/ partial availability of fresh water/ treated waste water supply from the concerned local government water supply agency in cases where requirement of ground water is more than 10 cubic meter/day.
- (c) Ground water quality data of bore well/ tube well/ dug well in respect of existing industries from NABL accredited laboratories/Government approved laboratories.
- (d) Proposal for rain water harvesting/ recharge within the premises as per Model Building Bye Laws issued by Ministry of Housing & Urban Affairs.
- (e) Impact Assessment report: All projects extracting/proposing to extract ground water in excess of 100 m3/day in Notified and non-notified areas shall have to mandatorily submit impact assessment report of existing/ proposed ground water withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants. Pro-forma for the report is given in Annexure-1.
- **(II) For Commercial User**
- (a) In cases where dewatering is involved, submission of impact assessment report prepared by a consultant on the ground water situation in the area giving detailed plan of pumping, proposed usage of pumped water and comprehensive impact assessment of the same on the ground water regime shall be mandatory. The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc.
- (b) An affidavit on non judicial stamp paper of Rs. 10/- regarding non availability of water from any other source in case water is required for construction in safe and semi critical areas.
- (c) Certificate from a government agency regarding non availability of treated sewage water for construction within 10 km radius of the site in notified areas.
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- (e) Details of water requirement computed as per National Building Code, 2016 (Annexure I), taking into account recycling/ reuse of treated water for flushing etc. (in case of completed infrastructure projects for commercial use).
- (f) Completion certificate from the concerned agency for infrastructure projects requiring water for commercial use.
- The District Ground Water Management Council reserves the right to ask for any other document(s) from the owner applicant for examination of the merit of the case.

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG024839

VALID FROM 06/09/2021 TO 05/09/2026

Registration No.: 202108000332

Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	**Application Form Serial No.**	BLMP0821RIN0018
Date of Submission	11/08/2021	**Specimen Signature**	
Company Name	Bajaj Energy Ltd	**Company Address**	Village-Itai Maida,Post-Sriduttaganj,Utraula,Balra

Location Particulars

District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	228M	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water:	972000	**Recharge Required**	0.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	CGWA NOC valid till 28.08.2021		
Against Case			

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) n case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring
- Piezometer is a borewell /tube well used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows for compliance of NOC:
- • The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- • The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- • No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- • The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.
- • For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- • The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- • All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- • A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.

- • Any other site-specific requirement regarding safety and access for measurement may be taken care of.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) **Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

Date :**05/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)

[See rules 15(2)]

(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG029714

VALID FROM 06/09/2021 TO 05/09/2026

Registration No.: 202108000181

Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	**Application Form Serial No.**	BLMP0821RIN0017
Date of Submission	05/08/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited	**Company Address**	Village - Itaimaida ,PO - Sriduttganj , Utraula Di

Location Particulars

District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	NA	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2010	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:	756000	**Recharge Required**	0.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	cgwa noc valid upto 28082021		
Against Case			

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form.

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) n case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring
- Piezometer is a borewell /tube well used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows for compliance of NOC:
- • The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- • The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- • No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- • The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.
- • For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- • The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- • All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- • The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- • A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.

- • Any other site-specific requirement regarding safety and access for measurement may be taken care of.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) **Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

Date :**05/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC029570

VALID FROM 18/10/2021 TO 17/10/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202108000370

Name of the Owner	NISHANT SRIVASTAVA		
Designation पद	UNIT HEAD	**Company Name** कंपनी का नाम	BAJAJ ENERGY LIMITED
Company Address कंपनी का पता	vill:Itaimaida,utraula,balrampur UP	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.- Balrampur UP	**Application No.**	BLMP0821NIN0011
Date of Submission	12/08/2021	**Specimen Signature**	

Location Particulars

District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	228M	**Municipality/Corporation**	No
Ward No./Holding No.			na

Particular of the Proposed Well and Pumping Device

Date of Construction/Sinking of the Well	15/04/2020		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/04/2020	

Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:	378000	**Recharge Required**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 0.00 cubic meter, as specified under the application form within the given time period.

GENERAL CONDITIONS:

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- All Users abstracting ground water in excess of 100 m3/d shall be required to submit impact assessment report prepared by an accredited consultant from CGWA and National Accreditation Board for Education and Training (NABET). The report should highlight environmental risks and proposed management strategies to overcome any significant environmental issues such as ground water level decline, land subsidence etc. within three months of completion of the same to Ground Water Department Uttar Pradesh. The list of accredited Individuals/ Institutions is available on the official web-portal of CGWA.
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitiring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.

- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars I information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC)/ PHD Chamber of Commerce & Industries / Laghu Udyog Bharati certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 50 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
-
- **(B) Infrastructural User:** The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions:
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**28/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

(Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii)
MINISTRY OF ENVIRONMENT AND FORESTS
New Delhi 14th September, 2006
Notification

S.O. 1533(E). - Whereas, a draft notification **under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 for imposing** certain restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or activities based on their potential environmental impacts as indicated in the Schedule to the notification, being undertaken in any part of India[1], unless prior environmental clearance has been accorded in accordance with the objectives of National Environment Policy **as approved by the Union Cabinet on 18th May, 2006** and the procedure specified in the notification, by the Central Government or the State or Union territory Level Environment Impact Assessment Authority (SEIAA), to be constituted by the Central Government in consultation with the State Government or the Union territory Administration concerned under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 for the purpose of this notification, was published in the Gazette of India ,Extraordinary, Part II, section 3, sub-section (ii) vide number S.O. 1324 (E) dated the 15th September ,2005 inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date on which copies of Gazette containing the said notification were made available to the public;

And whereas, copies of the said notification were made available to the public on 15th September, 2005;

And whereas, all objections and suggestions received in response to the above mentioned draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986, read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 and in supersession of the notification number S.O. 60 (E) dated the 27th January, 1994, except in respect of things done or omitted to be done before such supersession, the Central Government hereby directs that on and from the date of its publication the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to this notification entailing capacity addition with change in process and or technology shall be

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

undertaken in any part of India only after the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment

Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified hereinafter in this notification.

_____

[1]Includes the territorial waters

2. Requirements of prior Environmental Clearance (EC):- The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall hereinafter referred to be as the Central Government in the Ministry of Environment and Forests for matters falling under Category 'A' in the Schedule and at State level the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category 'B' in the said Schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

(i) All new projects or activities listed in the Schedule to this notification;

(ii) Expansion and modernization of existing projects or activities listed in the Schedule to this notification with addition of capacity beyond the limits specified for the concerned sector, that is, projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;

(iii) Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range.

3. State Level Environment Impact Assessment Authority:- (1) A State Level Environment Impact Assessment Authority hereinafter referred to as the SEIAA shall be constituted by the Central Government under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 comprising of three Members including a Chairman and a Member – Secretary to be nominated by the State Government or the Union territory Administration concerned.

(2) The Member-Secretary shall be a serving officer of the concerned State Government or Union territory administration familiar with environmental laws.

(3) The other two Members shall be either a professional or expert fulfilling the eligibility criteria given in Appendix VI to this notification.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(4) One of the specified Members in sub-paragraph (3) above who is an expert in the Environmental Impact Assessment process shall be the Chairman of the SEIAA.

(5) The State Government or Union territory Administration shall forward the names of the Members and the Chairman referred in sub- paragraph 3 to 4 above to the Central Government and the Central Government shall constitute the SEIAA as an authority for the purposes of this notification within thirty days of the date of receipt of the names.

(6) The non-official Member and the Chairman shall have a fixed term of three years (from the date of the publication of the notification by the Central Government constituting the authority).

[I] "(7) All decisions of the SEIAA shall be taken in a meeting and shall ordinarily be unanimous:

Provided that, in case a decision is taken by majority, the details of views, for and against it, shall be clearly recorded in the minutes and copy thereof sent to MoEF."

4. Categorization of projects and activities:-

(i) All projects and activities are broadly categorized in to two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources.

(ii) All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;

(iii) All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, *will* require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. [II] "In the absence of a duly constituted SEIAA

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

or SEAC, a Category 'B' project shall be considered at Central Level as a Category 'B' project;"

5. Screening, Scoping and Appraisal Committees:-

The same Expert Appraisal Committees (EACs) at the Central Government and SEACs (hereinafter referred to as the (EAC) and (SEAC) at the State or the Union territory level shall screen, scope and appraise projects or activities in Category 'A' and Category 'B' respectively. EAC and SEAC's shall meet at least once every month.

(a) The composition of the EAC shall be as given in Appendix VI. The SEAC at the State or the Union territory level shall be constituted by the Central Government in consultation with the concerned State Government or the Union territory Administration with identical composition;

(b) The Central Government may, with the prior concurrence of the concerned State Governments or the Union territory Administrations, constitutes one SEAC for more than one State or Union territory for reasons of administrative convenience and cost;

(c) The EAC and SEAC shall be reconstituted after every three years;

(d) The authorised members of the EAC and SEAC, concerned, may inspect any site(s) connected with the project or activity in respect of which the prior environmental clearance is sought, for the purposes of screening or scoping or appraisal, with prior notice of at least seven days to the applicant, who shall provide necessary facilities for the inspection;

(e) The EAC and SEACs shall function on the principle of collective responsibility. The Chairperson shall endeavour to reach a consensus in each case, and if consensus cannot be reached, the view of the majority shall prevail.

6. Application for Prior Environmental Clearance (EC):-

An application seeking prior environmental clearance in all cases shall be made in the prescribed Form 1 annexed herewith and Supplementary Form 1A, if applicable, as given in Appendix II, after the identification of prospective site(s) for the project and/or activities to which the application relates, before commencing any construction activity, or preparation of land, at the site by the applicant. The applicant shall furnish, along with the application, a copy

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

of the pre-feasibility project report except that, in case of construction projects or activities (item 8 of the Schedule) in addition to Form 1 and the Supplementary Form 1A, a copy of the conceptual plan shall be provided, instead of the pre-feasibility report.

7. Stages in the Prior Environmental Clearance (EC) Process for New Projects:-

7(i) The environmental clearance process for new projects will comprise of a maximum of four stages, all of which may not apply to particular cases as set forth below in this notification. These four stages in sequential order are:-

- Stage (1) Screening (Only for Category 'B' projects and activities)
- Stage (2) Scoping
- Stage (3) Public Consultation
- Stage (4) Appraisal

I. **Stage (1) - Screening**:

In case of Category 'B' projects or activities, this stage will entail the scrutiny of an application seeking prior environmental clearance made in Form 1 by the concerned State level Expert Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending up on the nature and location specificity of the project . The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. For categorization of projects into B1 or B2 except item 8 (b), the Ministry of Environment and Forests shall issue appropriate guidelines from time to time.

II. **Stage (2) - Scoping**:

(i) "Scoping": refers to the process by which the Expert Appraisal Committee in the case of Category 'A' projects or activities, and State level Expert Appraisal Committee in the case of Category 'B1' projects or activities, including applications for expansion and/or modernization and/or change in product mix of existing projects or activities, determine detailed and comprehensive Terms Of Reference (TOR) addressing all relevant environmental concerns for the preparation of an Environment Impact Assessment (EIA) Report in respect of the project or activity for which prior environmental clearance is sought. The Expert Appraisal Committee or State level Expert Appraisal Committee

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

concerned shall determine the Terms of Reference on the basis of the information furnished in the prescribed application Form1/Form 1A including Terns of Reference proposed by the applicant, a site visit by a sub- group of Expert Appraisal Committee or State level Expert Appraisal Committee concerned only if considered necessary by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned, Terms of Reference suggested by the applicant if furnished and other information that may be available with the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned. All projects and activities listed as Category 'B' in Item 8 of the Schedule (Construction/Township/Commercial Complexes /Housing) shall not require Scoping and will be appraised on the basis of Form 1/ Form 1A and the conceptual plan.

(ii) The Terms of Reference (TOR) shall be conveyed to the applicant by the Expert Appraisal Committee or State Level Expert Appraisal Committee as concerned within sixty days of the receipt of Form 1. In the case of Category A Hydroelectric projects Item 1(c) (i) of the Schedule the Terms of Reference shall be conveyed along with the clearance for pre-construction activities .If the Terms of Reference are not finalized and conveyed to the applicant within sixty days of the receipt of Form 1, the Terms of Reference suggested by the applicant shall be deemed as the final Terms of Reference approved for the EIA studies**.** The approved Terms of Reference shall be displayed on the website of the Ministry of Environment and Forests and the concerned State Level Environment Impact Assessment Authority.

(iii) Applications for prior environmental clearance may be rejected by the regulatory authority concerned on the recommendation of the EAC or SEAC concerned at this stage itself. In case of such rejection, the decision together with reasons for the same shall be communicated to the applicant in writing within sixty days of the receipt of the application.

III. **Stage (3) - Public Consultation**:

(i) "Public Consultation" refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. All Category 'A' and Category B1 projects or activities shall undertake Public Consultation, except the following:-

(a) modernization of irrigation projects (item 1(c) (ii) of the Schedule).

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(b) all projects or activities located within industrial estates or parks (item 7(c) of the Schedule) approved by the concerned authorities, and which are not disallowed in such approvals.

(c) expansion of Roads and Highways (item 7 (f) of the Schedule) which do not involve any further acquisition of land.

III "(cc) maintenance dredging provided the dredged material shall be disposed within port limits.";

III "(d) All Building or Construction projects or Area Development projects (which do not contain any category 'A' projects and activities) and Townships (item 8(a) and 8(b) in the Schedule to the notification)."

e) all Category 'B2' projects and activities.

f) all projects or activities concerning national defence and security or involving other strategic considerations as determined by the Central Government.

(ii) The Public Consultation shall ordinarily have two components comprising of:-

(a) a public hearing at the site or in its close proximity- district wise, to be carried out in the manner prescribed in Appendix IV, for ascertaining concerns of local affected persons;

(b) obtain responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project or activity.

(iii) the public hearing at, or in close proximity to, the site(s) in all cases shall be conducted by the State Pollution Control Board (SPCB) or the Union territory Pollution Control Committee (UTPCC) concerned in the specified manner and forward the proceedings to the regulatory authority concerned within 45(forty five) of a request to the effect from the applicant.

(iv) in case the State Pollution Control Board or the Union territory Pollution Control Committee concerned does not undertake and complete the public hearing within the specified period, and/or does not convey the proceedings of the public hearing within the prescribed period directly to the regulatory authority concerned as above, the regulatory

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

authority shall engage another public agency or authority which is not subordinate to the regulatory authority, to complete the process within a further period of forty five days,.

(v) If the public agency or authority nominated under the sub paragraph (iii) above reports to the regulatory authority concerned that owing to the local situation, it is not possible to conduct the public hearing in a manner which will enable the views of the concerned local persons to be freely expressed, it shall report the facts in detail to the concerned regulatory authority, which may, after due consideration of the report and other reliable information that it may have, decide that the public consultation in the case need not include the public hearing.

(vi) For obtaining responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project or activity, the concerned regulatory authority and the State Pollution Control Board (SPCB) or the Union territory Pollution Control Committee (UTPCC) shall invite responses from such concerned persons by placing on their website the Summary EIA report prepared in the format given in Appendix IIIA by the applicant along with a copy of the application in the prescribed form, within seven days of the receipt of a written request for arranging the public hearing. Confidential information including non-disclosable or legally privileged information involving Intellectual Property Right, source specified in the application shall not be placed on the web site*.* The regulatory authority concerned may also use other appropriate media for ensuring wide publicity about the project or activity. The regulatory authority shall, however, make available on a written request from any concerned person the Draft EIA report for inspection at a notified place during normal office hours till the date of the public hearing. All the responses received as part of this public consultation process shall be forwarded to the applicant through the quickest available means.

(vii) After completion of the public consultation, the applicant shall address all the material environmental concerns expressed during this process, and make appropriate changes in the draft EIA and EMP. The final EIA report, so prepared, shall be submitted by the applicant to the concerned regulatory authority for appraisal. The applicant may alternatively submit a supplementary report to draft EIA and EMP addressing all the concerns expressed during the public consultation.

IV. Stage (4) - Appraisal:

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(i) Appraisal means the detailed scrutiny by the Expert Appraisal Committee or State Level Expert Appraisal Committee of the application and other documents like the Final EIA report, outcome of the public consultations including public hearing proceedings, submitted by the applicant to the regulatory authority concerned for grant of environmental clearance. This appraisal shall be made by Expert Appraisal Committee or State Level Expert Appraisal Committee concerned in a transparent manner in a proceeding to which the applicant shall be invited for furnishing necessary clarifications in person or through an authorized representative. On conclusion of this proceeding, the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned shall make categorical recommendations to the regulatory authority concerned either for grant of prior environmental clearance on stipulated terms and conditions, or rejection of the application for prior environmental clearance, together with reasons for the same.

(ii) The appraisal of all projects or activities which are not required to undergo public consultation, or submit an Environment Impact Assessment report, shall be carried out on the basis of the prescribed application Form 1 and Form 1A as applicable, any other relevant validated information available and the site visit wherever the same is considered as necessary by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned.

(iii) The appraisal of an application be shall be completed by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned within sixty days of the receipt of the final Environment Impact Assessment report and other documents or the receipt of Form 1 and Form 1 A, where public consultation is not necessary and the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee shall be placed before the competent authority for a final decision within the next fifteen days .The prescribed procedure for appraisal is given in Appendix V ;

7(ii). Prior Environmental Clearance (EC) process for Expansion or Modernization or Change of product mix in existing projects:

All applications seeking prior environmental clearance for expansion with increase in the production capacity beyond the capacity for which prior environmental clearance has been granted under this notification or with increase in either lease area or production capacity in the case of mining projects or for the modernization of an existing unit with increase in

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

the total production capacity beyond the threshold limit prescribed in the Schedule to this notification through change in process and or technology or involving a change in the product –mix shall be made in Form I and they shall be considered by the concerned Expert Appraisal Committee or State Level Expert Appraisal Committee within sixty days, who will decide on the due diligence necessary including preparation of EIA and public consultations and the application shall be appraised accordingly for grant of environmental clearance.

8. Grant or Rejection of Prior Environmental Clearance (EC):

(i) The regulatory authority shall consider the recommendations of the EAC or SEAC concerned and convey its decision to the applicant within forty five days of the receipt of the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned or in other words within one hundred and five days of the receipt of the final Environment Impact Assessment Report, and where Environment Impact Assessment is not required, within one hundred and five days of the receipt of the complete application with requisite documents, except as provided below.

(ii) The regulatory authority shall normally accept the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned. In cases where it disagrees with the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned, the regulatory authority shall request reconsideration by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned within forty five days of the receipt of the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned while stating the reasons for the disagreement. An intimation of this decision shall be simultaneously conveyed to the applicant. The Expert Appraisal Committee or State Level Expert Appraisal Committee concerned, in turn, shall consider the observations of the regulatory authority and furnish its views on the same within a further period of sixty days. The decision of the regulatory authority after considering the views of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned shall be final and conveyed to the applicant by the regulatory authority concerned within the next thirty days.

(iii) In the event that the decision of the regulatory authority is not communicated to the applicant within the period specified in sub-paragraphs (i) or (ii) above, as applicable, the

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

applicant may proceed as if the environment clearance sought for has been granted or denied by the regulatory authority in terms of the final recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned.

(iv) On expiry of the period specified for decision by the regulatory authority under paragraph (i) and (ii) above, as applicable, the decision of the regulatory authority, and the final recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned shall be public documents.

(v) Clearances from other regulatory bodies or authorities shall not be required prior to receipt of applications for prior environmental clearance of projects or activities, or screening, or scoping, or appraisal, or decision by the regulatory authority concerned, unless any of these is sequentially dependent on such clearance either due to a requirement of law, or for necessary technical reasons.

(vi) Deliberate concealment and/or submission of false or misleading information or data which is material to screening or scoping or appraisal or decision on the application shall make the application liable for rejection, and cancellation of prior environmental clearance granted on that basis. Rejection of an application or cancellation of a prior environmental clearance already granted, on such ground, shall be decided by the regulatory authority, after giving a personal hearing to the applicant, and following the principles of natural justice.

9. Validity of Environmental Clearance (EC):

The "Validity of Environmental Clearance" is meant the period from which a prior environmental clearance is granted by the regulatory authority, or may be presumed by the applicant to have been granted under sub paragraph (iv) of paragraph 7 above, to the start of production operations by the project or activity, or completion of all construction operations in case of construction projects (item 8 of the Schedule), to which the application for prior environmental clearance refers. The prior environmental clearance granted for a project or activity shall be valid for a period of ten years in the case of River Valley projects (item 1(c) of the Schedule), project life as estimated by Expert Appraisal Committee or State Level Expert Appraisal Committee subject to a maximum of thirty years for mining projects and five years in the case of all other projects and activities. However, in the case of Area Development projects and Townships [item 8(b)], the validity

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

period shall be limited only to such activities as may be the responsibility of the applicant as a developer. This period of validity may be extended by the regulatory authority concerned by a maximum period of five years provided an application is made to the regulatory authority by the applicant within the validity period, together with an updated Form 1, and Supplementary Form 1A, for Construction projects or activities (item 8 of the Schedule). In this regard the regulatory authority may also consult the Expert Appraisal Committee or State Level Expert Appraisal Committee as the case may be.

10. Post Environmental Clearance Monitoring:

[IV] "(i)(a) In respect of Category 'A' project, it shall be mandatory for the project proponent to make public the environment clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the district or State where the project is located and in addition, this shall also be displayed in the project proponent's website permanently.

(b) In respect of Category 'B' projects, irrespective of its clearance by MoEF / SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environment clearance and the details of the MoEF website where it is displayed.

(c) The Ministry of Environment and Forests and the State/Union Territory Level Environmental Impact Assessment Authorities (SEIAAs), as the case may be, shall also place the environmental clearance in the public domain on Governmental portal.

(d) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.";

[IV] (ii) It shall be mandatory for the project management to submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the regulatory authority concerned, on 1st June and 1st December of each calendar year.

[IV] (iii) All such compliance reports submitted by the project management shall be public documents. Copies of the same shall be given to any person on application to the

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

concerned regulatory authority. The latest such compliance report shall also be displayed on the web site of the concerned regulatory authority.

11. Transferability of Environmental Clearance (EC):

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor, or by the transferee with a written "no objection" by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period. No reference to the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned is necessary in such cases.

12. Operation of EIA Notification, 1994, till disposal of pending cases:

From the date of final publication of this notification the Environment Impact Assessment (EIA) notification number S.O.60 (E) dated 27th January, 1994 is hereby superseded, except in suppression of the things done or omitted to be done before such suppression to the extent that in case of all or some types of applications made for prior environmental clearance and pending on the date of final publication of this notification, the Central Government may relax any one or all provisions of this notification except the list of the projects or activities requiring prior environmental clearance in Schedule I , or continue operation of some or all provisions of the said notification, for a period not exceeding one year from the date of issue of this notification.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

SCHEDULE

(See paragraph 2 and 7)

LIST OF PROJECTS OR ACTIVITIES REQUIRING PRIOR ENVIRONMENTAL CLEARANCE

Project or Activity		Category with threshold limit		Conditions if any
		A	B	
1		Mining, extraction of natural resources and power generation (for a specified production capacity)		
(1)	(2)	(3)	(4)	(5)
[V] "1(a)	(i) Mining of minerals.	≥ 50 ha. of mining lease area in respect of non-coal mine lease. > 150 ha of mining lease area in respect of coal mine lease. Asbestos mining irrespective of mining area	<50 ha ≥ 5 ha .of mining lease area in respect of non-coal mine lease. ≤ 150 ha ≥ 5 ha of mining lease area in respect of coal mine lease.	General Condition shall apply Note: Mineral prospecting Is exempted.”;
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks / sanctuaries / coral reefs, ecologically sensitive areas.	All projects.		
1(b)	Offshore and onshore oil and gas exploration, development & production	All projects		Note Exploration Surveys (not involving drilling) are exempted provided the concession areas have got previous clearance for physical survey
1(c)	River Valley pojects	(i) ≥ 50 MW hydroelectric power generation; (ii) ≥ 10,000 ha. of culturable command area	(i) < 50 MW ≥ 25 MW hydroelectric power generation; (ii) < 10,000 ha. of culturable command area	[V] “General Condition shall apply. Note: Irrigation projects not involving submergence or inter-state domain shall be appraised by the SEIAA as Category ‘B’ Projects.”;

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(1)	(2)	(3)	(4)	(5)
1(d)	Thermal Power Plants	[v] " ≥ 500 MW (coal / lignite / naphtha & gas based); ≥ 50 MW (Pet coke diesel and all other fuels including refinery residual oil waste except biomass); ≥ 20 MW (based on biomass or non hazardous municipal waste as fuel).”;	< 500 MW (coal / lignite / naphtha & gas based); <50 MW ≥ 5MW (Pet coke, diesel and all other fuels including refinery residual oil waste except biomass); ≥ 20 MW > 15 MW (based on biomass or non hazardous municipal waste as fuel).”;	[v] “General Condition shall apply. Note: (i) Power plant up to 15 MW, based on biomass and using auxiliary fuel such as coal / lignite / petroleum products up to 15% are exempt. (ii) Power plant up to 15 MW, based on non-hazardous municipal waste and using auxiliary fuel such as coal / lignite / petroleum products up to 15% are exempt. (iii) Power plants using waste heat boiler without any auxiliary fuel are exempt.”;
1(e)	Nuclear power projects and processing of nuclear fuel	All projects		
2		Primary Processing		
2(a)	Coal washeries	≥ 1 million ton/annum throughput of coal	<1million ton/annum throughput of coal	General Condition shall apply (If located within mining area the proposal shall be appraised together with the mining proposal)
2 (b)	Mineral beneficiation	≥ 0.1million ton/annum mineral throughput	< 0.1million ton/annum mineral throughput	General Condition shall apply (Mining proposal with Mineral beneficiation shall be appraised together for grant of clearance)

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

3		Materials Production		
(1)	(2)	(3)	(4)	(5)
3(a)	Metallurgical industries (ferrous & non ferrous)	a)Primary metallurgical industry All projects b) Sponge iron manufacturing ≥ 200TPD c) Secondary metallurgical processing industry All toxic and heavy metal producing units ≥ 20,000 tonnes /annum	 Sponge iron manufacturing <200TPD Secondary metallurgical processing industry i.)All toxic and heavy metal producing units <20,000 tonnes /annum ii.)All other non –toxic secondary metallurgical processing industries >5000 tonnes/annum	[V] "General condition shall apply. Note: (i) The recycling industrial units registered under the HSM Rules, are exempted. (ii) In case of secondary metallurgical processing industrial units, those projects involving operation of furnaces only such as induction and electrical arc furnace, submerged arc furnace, and cupola with capacity more than 30,000 tonnes per annum (TPA) would require environmental clearance. (iii) Plant / units other than power plants (given against entry no. 1(d) of the schedule), based on municipal solid waste (non-hazardous) are exempted."
3(b)	Cement plants	≥ 1.0 million tonnes/annum production capacity	<1.0 million tonnes/annum production capacity. All Stand alone grinding units	General Condition shall apply
4		Materials Processing		
(1)	(2)	(3)	(4)	(5)
4(a)	Petroleum refining industry	All projects	-	-
4(b)	Coke oven plants	≥2,50,000 tonnes/annum	<2,50,000 & ≥25,000 tonnes/annum	[V] "General Condition shall apply."
4(c)	Asbestos milling and asbestos based products	All projects	-	-

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(1)	(2)	(3)	(4)	(5)
4(d)	Chlor-alkali industry	≥300 TPD production Capacity or a unit located out side the notified industrial area/ estate	[v] "(i) All projects irrespective of the size, if located in a Notified Industrial Area/ Estate. (ii) <300 tonnes per day (TPD) and located outside a Notified Industrial Area/ Estate."	[v] "General as well as specific condition shall apply. No new Mercury Cell based plants will be permitted and existing units converting to membrane cell technology are exempted from this notification."
4(e)	Soda ash Industry	All projects	-	-
4(f)	Leather/skin/hide processing industry	New projects outside the industrial area or expansion of existing units out side the industrial area	All new or expansion of projects located within a notified industrial area/ estate	[v] "General as well as specific condition shall apply."
5		Manufacturing / Fabrication		
5(a)	Chemical fertilizers	[v] "All projects except Single Super Phosphate."	[v] "Single Super Phosphate."	-
5(b)	Pesticides industry and pesticide specific intermediates (excluding formulations)	All units producing technical grade pesticides	-	-
5(c)	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	All projects -	-	-
5(d)	Manmade fibers manufacturing	Rayon	Others	General Condition shall apply
5(e)	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	Located out side the notified industrial area/ estate -	Located in a notified industrial area/ estate	[v] "General as well as specific condition shall apply."

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(1)	(2)	(3)	(4)	(5)
5(f)	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	Located out side the notified industrial area/ estate	Located in a notified industrial area/ estate	[v] "General as well as specific condition shall apply."
5(g)	Distilleries	(i)All Molasses based distilleries (ii) All Cane juice/ non-molasses based distilleries ≥30 KLD	All Cane juice / non-molasses based distilleries – <30 KLD	General Condition shall apply
5(h)	Integrated paint industry	-	All projects	General Condition shall apply
5(i)	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp with out bleaching	Pulp manufacturing and Pulp& Paper manufacturing industry	Paper manufacturing industry without pulp manufacturing	General Condition shall apply
5(j)	Sugar Industry	-	≥ 5000 tcd cane crushing capacity	General Condition shall apply
5(k)	[v] Omitted			
6		Service Sectors		
6(a)	Oil & gas transportation pipe line (crude and refinery/ petrochemical products), passing through national parks / sanctuaries /coral reefs / ecologically sensitive areas including LNG Terminal	All projects		-

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(1)	(2)	(3)	(4)	(5)
6(b)	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	-	All projects	General Condition shall apply
7		Physical Infrastructure including Environmental Services		
7(a)	Air ports	V "All projects including airstrips, which are for commercial use."	-	V "Note: Air strips, which do not involve bunkering/ refueling facility and or Air Traffic Control, are exempted."
7(b)	All ship breaking yards including ship breaking units	All projects	-	-
7©	Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes.	If at least one industry in the proposed industrial estate falls under the Category A, entire industrial area shall be treated as Category A, irrespective of the area. Industrial estates with area greater than 500 ha. and housing at least one Category B industry.	Industrial estates housing at least one Category B industry and area <500 ha. Industrial estates of area> 500 ha. and not housing any industry belonging to Category A or B.	V "Genral as well as special conditions shall apply. Note: 1. Industrial Estate of area below 500 ha. and not housing any industry of Category 'A' or 'B' does not require clearance. 2. If the area is less than 500 ha. but contains building and construction projects > 20,000 Sq. mts. And or development area more than 50 ha it will be treated as activity listed at serial no. 8(a) or 8(b) in the Schedule, as the case may be."
7(d)	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	All integrated facilities having incineration &landfill or incineration alone	All facilities having land fill only	General Condition shall apply

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(1)	(2)	(3)	(4)	(5)
7(e)	[v] "Ports, harbours, break waters, dredging."	≥ 5 million TPA of cargo handling capacity (excluding fishing harbours)	< 5 million TPA of cargo handling capacity and/or ports/ harbours ≥10,000 TPA of fish handling capacity	[v] "General Condition shall apply. Note: 1. Capital dredging inside and outside the ports or harbors and channels are included; 2. Maintenance dredging is exempt provided it formed part of the original proposal for which Environment Management Plan (EMP) was prepared and environmental clearance obtained."
7(f)	Highways	i) New National High ways; and ii) Expansion of National High ways greater than 30 KM, involving additional right of way greater than 20m involving land acquisition and passing through more than one State.	[v] " i) All State Highway Project; and ii) State Highway expansion projects in hilly terrain (above 1,000 m AMSL) and or ecologically sensitive areas."	General Condition shall apply. Note: Highways include expressways."
7(g)	Aerial ropeways	[v(xvi)(a)] "(i) All projects located at altitude of 1,000 mtr. And above. (ii) All projects located in notified ecologically sensitive areas."	[v(xvi)(b)] "All projects except those covered in column (3)."	General Condition shall apply
7(h)	Common Effluent Treatment Plants (CETPs)		All projects	General Condition shall apply
7(i)	Common Municipal Solid Waste Management Facility (CMSWMF)		All projects	General Condition shall apply
8		Building /Construction projects/Area Development projects and Townships		
8(a)	Building and Construction projects		≥20000 sq.mtrs and <1,50,000 sq.mtrs. of built-up area#	#(built up area for covered construction; in the case of facilities open to the sky, it will be the activity area)
8(b)	Townships and Area Development projects.		Covering an area ≥ 50 ha and or built up area ≥1,50,000 sq .mtrs ++	++All projects under Item 8(b) shall be appraised as Category B1

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

Note:-

[V(xvii)] **"General Condition (GC):**
Any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as identified by the Central Pollution Control Board from time to time, (iii) Eco-sensitive areas as notified under section 3 of the Environment (Protection) Act, 1986, such as, Mahabaleshwar Panchgani, Matheran, Pachmarhi, Dahanu, Doon Valley, and (iv) inter-State boundaries and international boundaries:

Provided that the requirement regarding distance of 10 km of the inter-State boundaries can be reduced or completely done away with by an agreement between the respective States or U.Ts sharing the common boundary in case the activity does not fall within 10 kilometres of the areas mentioned at item (i), (ii) and (iii) above."

Specific Condition (SC):
If any Industrial Estate/Complex / Export processing Zones /Special Economic Zones/Biotech Parks / Leather Complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre –defined set of activities (not necessarily homogeneous, obtains prior environmental clearance, individual industries including proposed industrial housing within such estates /complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate).

[No. J-11013/56/2004-IA-II (I)]
(R.CHANDRAMOHAN)
JOINT SECRETARY TO THE GOVERNMENT OF INDIA

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

APPENDIX I

(See paragraph – 6)

FORM 1

[VI(a)] **"(I) Basic Information**

Serial Number	Item	Details
1.	Name of the project/s	
2.	S. No. in schedule	
3.	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	
4.	New/Expansion/Modernization	
5.	Existing Capacity/Area etc.	
6.	Category of Project i.e. 'A' or 'B'	
7.	Does it attract the general condition? If' Yes, please specify.	
8.	Does it attract the specific condition? If' Yes, please specify.	
9.	Location	
	Plot/Survey/Khasra No.	
	Village	
	Tehsil	
	District	
	State	
10.	Nearest railway station/airport along with distance in kms.	
11.	Nearest Town, city, District Headquarters along with distance in kms.	
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	
13.	Name of the applicant	
14.	Registered Address	
15.	Address for correspondence:	
	Name	
	Designation (Owner/Partner/CEO)	
	Address	
	Pin Code	
	E-mail	
	Telephone No.	
	Fax No.	
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	Village-District-State 1. 2. 3.
17.	Interlinked Projects	
18	Whether separate application of interlinked project has been submitted?	

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

19.	If yes, date of submission	
20.	If no, reason	
21.	Whether the proposal involves approval/ clearance under: If yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980 ? (b) The Wildlife (Protection) Act, 1972 ? (c) The C.R.Z. Notification, 1991 ?	
22.	Whether there is any Government Order/Policy relevant/ relating to the site ?	
23.	Forest land involved (hectares)	
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up ? (a) Name of the Court. (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)		
1.2	Clearance of existing land, vegetation and buildings?		
1.3	Creation of new land uses?		
1.4	Pre-construction investigations e.g. bore houses, soil testing?		
1.5	Construction works?		
1.6	Demolition works?		
1.7	Temporary sites used for construction works or housing of construction workers?		
1.8	Above ground buildings, structures or earthworks including linear structures, cut And fill or excavations		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

1.9	Underground works including mining or tunneling?		
1.10	Reclamation works?		
1.11	Dredging?		
1.12	Offshore structures?		
1.13	Production and manufacturing processes?		
1.14	Facilities for storage of goods or materials?		
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?		
1.16	Facilities for long term housing of operational workers?		
1.17	New road, rail or sea traffic during construction or operation?		
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?		
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?		
1.20	New or diverted transmission lines or pipelines?		
1.21	Impoundment, damming, culverting, realignment or other changes to the ydrology of watercourses or aquifers?		
1.22	Stream crossings?		
1.23	Abstraction or transfers of water form ground or surface waters?		
1.24	Changes in water bodies or the land surface affecting drainage or run-off?		
1.25	Transport of personnel or materials for construction, operation or decommissioning?		
1.26	Long-term dismantling or decommissioning or restoration works?		
1.27	Ongoing activity during decommissioning which could have an impact on the environment?		
1.28	Influx of people to an area in either temporarily or permanently?		
1.29	Introduction of alien species?		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

1.30	Loss of native species or genetic diversity?		
1.31	Any other actions?		

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)		
2.2	Water (expected source & competing users) unit: KLD		
2.3	Minerals (MT)		
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)		
2.5	Forests and timber (source – MT)		
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)		
2.7	Any other natural resources (use appropriate standard units)		

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)		
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)		
3.3	Affect the welfare of people e.g. by changing living conditions?		
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,		
3.5	Any other causes		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes		
4.2	Municipal waste (domestic and or commercial wastes)		
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)		
4.4	Other industrial process wastes		
4.5	Surplus product		
4.6	Sewage sludge or other sludge from effluent treatment.		
4.7	Construction or demolition wastes		
4.8	Redundant machinery or equipment		
4.9	Contaminated soils or other materials		
4.10	Agricultural wastes		
4.11	Other solid wastes		

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources.		
5.2	Emissions from production processes		
5.3	Emissions from materials handling including storage or transport		
5.4	Emissions from construction activities including plant and equipment		
5.5	Dust or odours from handling of materials including construction materials, sewage and waste		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

5.6	Emissions from incineration of waste		
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)		
5.8	Emissions from any other sources		

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers		
6.2	From industrial or similar processes		
6.3	From construction or demolition		
6.4	From blasting or piling		
6.5	From construction or operational traffic		
6.6	From lighting or cooling systems		
6.7	From any other sources		

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials		
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)		
7.3	By deposition of pollutants emitted to air into the land or into water		
7.4	From any other sources		
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances		
8.2	From any other causes		
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?		

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. lities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other		
9.2	Lead to after-use of the site, which could have an impact on the environment		
9.3	Set a precedent for later developments		
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(III) Environmental Sensitivity

S.No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value		
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests		
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, esting, foraging, resting, over wintering, migration		
4	Inland, coastal, marine or underground waters		
5	State, National boundaries		
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas		
7	Defence installations		
8	Densely populated or built-up area		
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*		
10	Areas containing important, high quality or scarce Resources *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*		
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*		
12	Areas susceptible to natural hazard which could cause the project to present environmental Problems (*earthquakes, subsidence, landslides, erosion, Flooding or extreme or adverse climatic conditions*)		

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(IV). Proposed Terms of Reference for EIA studies

VI(b) "I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost."

Date: _____

Place: _____

Signature of the applicant
With Name and Full Address
(Project Proponent/Authorised Signatory)

NOTE:

1. The projects involving clearance under Coastal Regulation Zone Notification, 1991 shall submit with the application a C.R.Z. map duly demarcated by one of the authorized agencies, showing the project activities, w.r.t. C.R.Z. (at the stage of TOR) and the recommendations of the State Coastal Zone Management Authority (at the stage of EC). Sinmultaneous action shall also be taken to obtain the requisite clearance under the provisions of the C.R.Z. Notification, 1991 for the activities to be located in the CRZ.
2. The projects to be located within 10 km of the National Prks, Sancturies, Biosphere Reserves, Migratory Corridors of Wile Animals, the project proponenet shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden thereon (at the stage of EC)."
3. All correspondence with the Ministry of Environment & Forests including aubmission of application for TOR/Environmental Clearance, subsequent clarifications, as may be required from time to time, participation in the EAC Meeting on behalf of the project proponent shall be made by the authorized signatory only. The authorized signatory should also submit a document in support of his claim of being and authorized signatory for the specific project."

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

APPENDIX II
(See paragraph 6)

FORM-1 A (only for construction projects listed under item 8 of the Schedule)

CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring programme)

1. **LAND ENVIRONMENT**

(Attach panoramic view of the project site and the vicinity)

1.1. Will the existing landuse get significantly altered from the project that is not consistent with the surroundings? (Proposed landuse must conform to the approved Master Plan / Development Plan of the area. Change of landuse if any and the statutory approval from the competent authority be submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.

1.2. List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.

1.3. What are the likely impacts of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing landuse, disturbance to the local ecology).

1.4. Will there be any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity etc may be given).

1.5. Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)

1.6. What are the quantities of earthwork involved in the construction activity-cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc.)

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

1.7. Give details regarding water supply, waste handling etc during the construction period.

1.8. Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)

1.9. Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)

2. WATER ENVIRONMENT

2.1. Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement met? State the sources & quantities and furnish a water balance statement.

2.2. What is the capacity (dependable flow or yield) of the proposed source of water?

2.3. What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)

2.4. How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)

2.5. Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)

2.6. What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)

2.7. Give details of the water requirements met from water harvesting? Furnish details of the facilities created.

2.8. What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long term basis? Would it aggravate the problems of flooding or water logging in any way?

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

2.9. What are the impacts of the proposal on the ground water? (Will there be tapping of ground water; give the details of ground water table, recharging capacity, and approvals obtained from competent authority, if any)

2.10. What precautions/measures are taken to prevent the run-off from construction activities polluting land & aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts)

2.11. How is the storm water from within the site managed?(State the provisions made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)

2.12. Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)

2.13. What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal)

2.14. Give details of dual plumbing system if treated waste used is used for flushing of toilets or any other use.

3. VEGETATION

3.1. Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with it's unique features, if any)

3.2. Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)

3.3. What are the measures proposed to be taken to minimize the likely impacts on important site features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale)

4. FAUNA

4.1. Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

4.2. Any direct or indirect impacts on the avifauna of the area? Provide details.

4.3. Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna

5. AIR ENVIRONMENT

5.1. Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)

5.2. What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.

5.3. Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.

5.4. Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.

5.5. Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.

5.6. What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.

6. AESTHETICS

6.1. Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?

6.2. Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?

6.3. Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.

6.4. Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.

7. SOCIO-ECONOMIC ASPECTS

7.1. Will the proposal result in any changes to the demographic structure of local population? Provide the details.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

7.2. Give details of the existing social infrastructure around the proposed project.

7.3. Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?

8. BUILDING MATERIALS

8.1. May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)

8.2. Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?

8.3. Are recycled materials used in roads and structures? State the extent of savings achieved?

8.4. Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.

9. ENERGY CONSERVATION

9.1. Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?

9.2. What type of, and capacity of, power back-up to you plan to provide?

9.3. What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?

9.4. What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.

9.5. Does the layout of streets & buildings maximise the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.

9.6. Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?

9.7. Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.

9.8. What are the likely effects of the building activity in altering the micro-climates? Provide a self assessment on the likely impacts of the proposed construction on

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

creation of heat island & inversion effects?

9.9. What are the thermal characteristics of the building envelope? (a) roof; (b) external walls; and (c) fenestration? Give details of the material used and the U-values or the R values of the individual components.

9.10. What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.

9.11. If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.

9.12. What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.

9.13. To what extent the non-conventional energy technologies are utilised in the overall energy consumption? Provide details of the renewable energy technologies used.

10. Environment Management Plan

The Environment Management Plan would consist of all mitigation measures for each item wise activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

APPENDIX III

(See paragraph 7

GENERIC STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSENT DOCUMENT

S.NO	EIA STRUCTURE	CONTENTS
1.	Introduction	• Purpose of the report • Identification of project & project proponent • Brief description of nature, size, location of the project and its importance to the country, region • Scope of the study – details of regulatory scoping carried out (As per Terms of Reference)
2.	Project Description	• Condensed description of those aspects of the project (based on project feasibility study), likely to cause environmental effects. Details should be provided to give clear picture of the following: • Type of project • Need for the project • Location (maps showing general location, specific location, project boundary & project site layout) • Size or magnitude of operation (incl. Associated activities required by or for the project • Proposed schedule for approval and implementation • Technology and process description • Project description. Including drawings showing project layout, components of project etc. Schematic representations of the feasibility drawings which give information important for EIA purpose • Description of mitigation measures incorporated into the project to meet environmental standards, environmental operating conditions, or other EIA requirements (as required by the scope) • Assessment of New & untested technology for the risk of technological failure

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

3.	Description of the Environment	• Study area, period, components & methodology • Establishment of baseline for valued environmental components, as identified in the scope • Base maps of all environmental components
4.	Anticipated Environmental Impacts & Mitigation Measures	• Details of Investigated Environmental impacts due to project location, possible accidents, project design, project construction, regular operations, final decommissioning or rehabilitation of a completed project • Measures for minimizing and / or offsetting adverse impacts identified • Irreversible and Irretrievable commitments of environmental components • Assessment of significance of impacts (Criteria for determining significance, Assigning significance) • Mitigation measures
5.	Analysis of Alternatives (Technology & Site)	• In case, the scoping exercise results in need for alternatives: • Description of each alternative • Summary of adverse impacts of each alternative • Mitigation measures proposed for each alternative and • Selection of alternative
6.	Environmental Monitoring Program	• Technical aspects of monitoring the effectiveness of mitigation measures (incl. Measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules)
7.	Additional Studies	• Public Consultation • Risk assessment • Social Impact Assessment. R&R Action Plans
8.	Project Benefits	• Improvements in the physical infrastructure • Improvements in the social infrastructure

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

		• Employment potential –skilled; semi-skilled and unskilled • Other tangible benefits
9.	Environmental Cost Benefit Analysis	If recommended at the Scoping stage
10.	EMP	• Description of the administrative aspects of ensuring that mitigative measures are implemented and their effectiveness monitored, after approval of the EIA
11	Summary & Conclusion (This will constitute the summary of the EIA Report)	• Overall justification for implementation of the project • Explanation of how, adverse effects have been mitigated
12.	Disclosure of Consultants engaged	• The names of the Consultants engaged with their brief resume and nature of Consultancy rendered

APPENDIX III A

(See paragraph 7)

CONTENTS OF SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT

The Summary EIA shall be a summary of the full EIA Report condensed to ten A-4 size pages at the maximum. It should necessarily cover in brief the following Chapters of the full EIA Report: -

1. Project Description
2. Description of the Environment
3. Anticipated Environmental impacts and mitigation measures
4. Environmental Monitoring Programme
5. Additional Studies
6. Project Benefits
7. Environment Management Plan

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

APPENDIX IV

(See paragraph 7)

PROCEDURE FOR CONDUCT OF PUBLIC HEARING

1.0 The Public Hearing shall be arranged in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site(s) or in its close proximity District -wise, by the concerned State Pollution Control Board (SPCB) or the Union Territory Pollution Control Committee (UTPCC).

2. 0 **The Process:**

2.1 The Applicant shall make a request through a simple letter to the Member Secretary of the SPCB or Union Territory Pollution Control Committee, in whose jurisdiction the project is located, to arrange the public hearing within the prescribed statutory period. In case the project site is covering more than one District or State or Union Territory, the public hearing is mandated in each District, State or Union Territory in which the project is located and the applicant shall make separate requests to each concerned SPCB or UTPCC for holding the public hearing as per this procedure.

2.2 The Applicant shall enclose with the letter of request, at least 10 hard copies and an equivalent number of soft (electronic) copies of the draft EIA Report with the generic structure given in Appendix III including the Summary Environment Impact Assessment report in English and in the official languageof the state/local language, prepared strictly in accordance with the Terms of
Reference communicated after Scoping (Stage-2). Simultaneously the applicant shall arrange to forward copies, one hard and one soft, of the above draft EIA Report along with the Summary EIA report to the following authorities or offices, within whose jurisdiction the project will be located:

(a) District Magistrate/District collector/Deputy commissioner/s
(b) Zila Parishad or Municipal Corporation or Panchayats Union
(c) District Industries Office
(d) Urban Local Bodies (ULBs) / PRIs Concerned / Development authorities.
(d) Concerned Regional Office of the Ministry of Environment and Forests

2.3 On receiving the draft Environmental Impact Assessment report, the abovementioned authorities except the Regional Office of MoEF, shall arrange to widely publicize it within their respective jurisdictions requesting the interested persons to send their comments to the concerned regulatory authorities. They shall also make available the draft EIA Report for inspection electronically or otherwise to the public during normal office hours till the Public Hearing is over.

2.4 The SPCB or UTPCC concerned shall also make similar arrangements for giving publicity about the project within the State/Union Territory and make available the Summary of the draft Environmental Impact Assessment report (Appendix III A) for

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I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

inspection in select offices or public libraries or any other suitable location etc. They shall also additionally make available a copy of the draft Environmental Impact Assessment report to the above five authorities/offices as given in para 2.2.

3.0 Notice of Public Hearing:

3.1 The Member-Secretary of the concerned SPCB or UTPCC shall finalize the date, time and exact venue for the conduct of public hearing within 7(seven) days of the date of receipt of the draft Environmental Impact Assessment report from the project proponent, and advertise the same in one major National Daily and one Regional vernacular Daily / Official State Language. A minimum notice period of 30(thirty) days shall be provided to the public for furnishing their responses;

3.2 The advertisement shall also inform the public about the places or offices where the public could access the draft Environmental Impact Assessment report and the Summary Environmental Impact Assessment report before the public hearing**.** In places where the newspapers do not reach, the Competent Authority should arrange to inform the local public about the public hearing by other means such as by way of beating of drums as well as advertisement / announcement on radio / television.

3.3 No postponement of the date, time, venue of the public hearing shall be undertaken, unless some untoward emergency situation occurs and then only on the recommendation of the concerned District Magistrate/District collector/Deputy Commissioner, the postponement shall be notified to the public through the same National and Regional vernacular dailies and also prominently displayed at all the identified offices by the concerned SPCB or Union Territory Pollution Control Committee;

3.4 In the above exceptional circumstances, fresh date, time and venue for the public consultation shall be decided by the Member – Secretary of the concerned SPCB or UTPCC only in consultation with the District Magistrate/District collector/Deputy Commissioner and notified afresh as per procedure under 3.1 above.

4.0 Supervision and Presiding over the Hearing:

4.1 The District Magistrate/District collector/Deputy Commissioner or his or her representative not below the rank of an Additional District Magistrate assisted by a representative of SPCB or UTPCC**,** shall Supervise and preside over the entire public hearing process.

5.0 Videography

5.1 The SPCB or UTPCC shall arrange to video film the entire proceedings. A copy of the videotape or a CD shall be enclosed with the public hearing proceedings while Forwarding it to the Regulatory Authority concerned.

6.0 Proceedings

6.1 The attendance of all those who are present at the venue shall be noted and annexed with the final proceedings.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

6.2 There shall be no quorum required for attendance for starting the proceedings.

6.3 A representative of the applicant shall initiate the proceedings with a presentation on the project and the Summary EIA report.

6.4 Persons present at the venue shall be granted the opportunity to seek information or clarifications on the project from the Applicant. The summary of the public hearing proceedings accurately reflecting all the views and concerns expressed shall be recorded by the representative of the SPCB or UTPCC and read over to the audience at the end of the proceedings explaining the contents in the local/vernacular language and the agreed minutes shall be signed by the District Magistrate/District collector/Deputy Commissioner or his or her representative on the same day and forwarded to the SPCB/UTPCC concerned**.**

6.5 A Statement of the issues raised by the public and the comments of the Applicant shall also be prepared in the local language or the Official State language, as the case may be, and in English and annexed to the proceedings:

6.6 The proceedings of the public hearing shall be conspicuously displayed at the office of the Panchyats within whose jurisdiction the project is located, office of the concerned Zila Parishad, District Magistrate/District collector/Deputy Commissioner, and the SPCB or UTPCC . The SPCB or
UTPCC shall also display the proceedings on its website for general information. Comments, if any, on the proceedings which may be sent directly to the concerned regulatory authorities and the applicant concerned.

7.0 **Time period for completion of public hearing**

7.1 The public hearing shall be completed within a period of 45 (forty five) days from date of receipt of the request letter from the Applicant. Thereafter the SPCB or UTPCC concerned shall sent the public hearing proceedings to the concerned regulatory authority within 8(eight) days of the completion of the public hearing.Simultaneously, a copy will also be provided to the project proponent.The applicant may also directly forward a copy of the approved public hearing proceedings to the regulatory authority concerned along with the final Environmental Impact Assessment report or supplementary report to the draft EIA report prepared after the public hearing and public consultations incorporating the concerns expressed in the public hearing along with action plan and financial allocation, item-wise, to address those concerns.”.

7.2 If the SPCB or UTPCC fails to hold the public hearing within the stipulated 45(forty five) days, the Central Government in Ministry of Environment and Forests for Category ‘A’ project or activity and the State Government or Union Territory Administration for Category ‘B’ project or activity at the request of the SEIAA, shall engage any other agency or authority to complete the process, as per procedure laid down in this notification.

APPENDIX –V

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

(See paragraph 7)

PROCEDURE PRESCRIBED FOR APPRAISAL

1. The applicant shall apply to the concerned regulatory authority through a simple communication enclosing the following documents where public consultations are mandatory:

- Final Environment Impact Assessment Report [20(twenty) hard copies and 1 (one) soft copy)]
- A copy of the video tape or CD of the public hearing proceedings
- A copy of final layout plan (20 copies)
- A copy of the project feasibility report (1 copy)

2. The Final EIA Report and the other relevant documents submitted by the applicant shall be scrutinized in office within 30 days from the date of its receipt by the concerned Regulatory Authority strictly with reference to the TOR and the inadequacies noted shall be communicated electronically or otherwise in a single set to the Members of the EAC /SEAC enclosing a copy each of the Final EIA Report including the public hearing proceedings and other public responses received along with a copy of Form -1or Form 1A and scheduled date of the EAC /SEAC meeting for considering the proposal.

3. Where a public consultation is not mandatory, the appraisal shall be made on the basis of the prescribed application Form 1 and EIA report, in the case of all projects and activities other than Item 8 of the Schedule. In the case of Item 8 of the Schedule, considering its unique project cycle, the EAC or SEAC concerned shall appraise all Category B projects or activities on the basis of Form 1, Form 1A and the conceptual plan and make recommendations on the project regarding grant of environmental clearance or otherwise and also stipulate the conditions for environmental clearance."

4. Every application shall be placed before the EAC/SEAC and its appraisal completed within 60 days of its receipt with requisite documents / details in the prescribed manner.

5. The applicant shall be informed at least 15 (fifteen) days prior to the scheduled date of the EAC /SEAC meeting for considering the project proposal.

6. The minutes of the EAC /SEAC meeting shall be finalised within 5 working days of the meeting and displayed on the website of the concerned regulatory authority. In case the project or activity is recommended for grant of EC, then the minutes shall clearly list out the specific environmental safeguards and conditions. In case the recommendations are for rejection, the reasons for the same shall also be explicitly stated.

Note: The principal rules were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) vide notification number S.O. 1533 (E), dated 14th September, 2006 and amended vide S.O. 1737 (E), dated the 11th October, 2007.

APPENDIX VI

(See paragraph 5)

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

COMPOSITION OF THE SECTOR/ PROJECT SPECIFIC EXPERT APPRAISAL COMMITTEE (EAC) FOR CATEGORY A PROJECTS AND THE STATE/UT LEVEL EXPERT APPRAISAL COMMITTEES (SEACs) FOR CATEGORY B PROJECTS TO BE CONSTITUTED BY THE CENTRAL GOVERNMENT `

1. The Expert Appraisal Committees (EAC(s) and the State/UT Level Expert Appraisal Committees (SEACs) shall consist of only professionals and experts fulfilling the following eligibility criteria:

Professional: The person should have at least (i) 5 years of formal University training in the concerned discipline leading to a MA/MSc Degree, or (ii) in case of Engineering /Technology/Architecture disciplines, 4 years formal training in a professional training course together with prescribed practical training in the field leading to a B.Tech/B.E./B.Arch. Degree, or (iii) Other professional degree (e.g. Law) involving a total of 5 years of formal University training and prescribed practical training, or (iv) Prescribed apprenticeship/article ship and pass examinations conducted by the concerned professional association (e.g. Chartered Accountancy),or (v) a University degree , followed by 2 years of formal training in a University or Service Academy (e.g. MBA/IAS/IFS). In selecting the individual professionals, experience gained by them in their respective fields will be taken note of.

Expert: A professional fulfilling the above eligibility criteria with at least 15 years of relevant experience in the field, or with an advanced degree (e.g. Ph.D.) in a concerned field and at least 10 years of relevant experience.

Age: Below 70 years. However, in the event of the non-availability of /paucity of experts in a given field, the maximum age of a member of the Expert Appraisal Committee may be allowed up to 75 years

2. The Members of the EAC shall be Experts with the requisite expertise and experience in the following fields /disciplines. In the event that persons fulfilling the criteria of “Experts” are not available, Professionals in the same field with sufficient experience may be considered:

- **Environment Quality Experts**: Experts in measurement/monitoring, analysis and interpretation of data in relation to environmental quality

- **Sectoral Experts in Project Management**: Experts in Project Management or Management of Process/Operations/Facilities in the relevant sectors.

- **Environmental Impact Assessment Process Experts**: Experts in conducting and carrying out Environmental Impact Assessments (EIAs) and preparation of Environmental Management Plans (EMPs) and other Management plans and who have wide expertise and knowledge of predictive techniques and tools used in the EIA process

- **Risk Assessment Experts**

- **Life Science Experts in floral and faunal management**

- **Forestry and Wildlife Experts**

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

- **Environmental Economics Expert with experience in project appraisal**

3. The Membership of the EAC shall not exceed 15 (fifteen) regular Members. However the Chairperson may co-opt an expert as a Member in a relevant field for a particular meeting of the Committee.

4. The Chairperson shall be an outstanding and experienced environmental policy expert or expert in management or public administration with wide experience in the relevant development sector.

5. The Chairperson shall nominate one of the Members as the Vice Chairperson who shall
preside over the EAC in the absence of the Chairman /Chairperson.

6. A representative of the Ministry of Environment and Forests shall assist the Committee as its Secretary.

7. The maximum tenure of a Member, including Chairperson, shall be for 2 (two) terms of 3 (three) years each.

8. The Chairman / Members may not be removed prior to expiry of the tenure without cause and proper enquiry.

I; II; III (i), (ii); IV (a), (b); V (i), (ii), (iii)(a), (b), (c), (iv), (v), (vi) (a), (b), (vii), (viii) (a), (b), (ix), (x), (xi), (xii) (a), (b) , (xiii), (xiv) (a), (b), (xv) (a), (b), (xvi) (a), (b), (xvii); VI (a), (b); VII & VIII of the Notification, S.O. 3067(E) dated 01.12.2009 of the Ministry of Environment and Forests, (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii), No. 2002] New Delhi, Tuesday, November 1, 2009; an amendment to EC notification S.O.1533(E) dated 14.09.2006

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O.A. No.691/2022 Titled as Rama Shanker Awasthi Vs. State of Uttar Pradesh & Ors. (Reply on behalf of the Respondent No.7)

1 message

Legal Vibes <legalvibes.lawfirm@gmail.com> Sun, Aug 4, 2024 at 6:04 PM
To: Sanjeet Paliwal <sanjeetcs89@gmail.com>, psecforest-up@nic.in, grievance@uppcb.com, chairman.seiaa.up@gmail.com, upgwd.in@gmail.com, mcgwa-cgwb@nic.in, kadhikari@bajajhindusthan.com
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Dear all,
Please find the attachment reply on behalf of the Respondent No.7 (M/s. Bajaj Energy Ltd.)
Kindly accept the services.

Reply Bajaj Energy Final 03.08.2024.pdf

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Thanks & Regards,

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