BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE AT CHENNAI

Appeal No. 77 of 2022

M/s.Varalakshmi Starch Industries (P) Ltd.,
Rep. by its Managing Director V. Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem - 636007. ...Appellant

AND

Tamil Nadu Pollution Control Board
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., …Respondents

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The documents filled above are certified as true copies of their respective Originals

Dated at Chennai on this the 21 day of Feb, 2026

Appellant

For Varalakshmi Starch Industries (P) Ltd.,

(V. Anbalagan)
Managing Director

BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE

AT CHENNAI

Appeal No. 77 OF 2022

M/s. Varalakshmi Starch Industries (P) Ltd.,
Rep. by its Managing Director V. Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem - 636007. ....Appellant

AND

Tamil Nadu Pollution Control Board (TNPCB)
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., …Respondents

ADDITIONAL AFFIDAVIT ON BEHALF OF THE APPELLANT

I, V. Anbalagan, Son of R. Varadharajan, Hindu, aged about 69 years, having office at "Varalakshmi Tower", 2nd Floor, 127/1 Gandhi Road, Hasthampatty, Salem – 636007, now temporarily come down to Chennai do hereby solemnly affirm and state as under:

I am the Managing Director of the Appellant herein and as such fully acquainted with the facts and circumstances of the present case. I am filing this affidavit on behalf of the Appellant Company.

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

1) It is respectfully submitted that pursuant to the Appeal filed before the Hon'ble Tribunal, TNPCB Board senior officials inspected the Appellant's unit on 27.12.2022 and pursuant to the Hon'ble Tribunal's order dated 03.02.2023, TNPCB vide their Proceedings dated 16.02.2023 directed the Appellant to comply with 12 numbers of directions. It is submitted that TNPCB vide its Affidavit dated 28.04.2025 submitted to the Hon'ble NGT stated that the Appellant complied with 6 directions, partially complied with 3 directions and not complied with 3 directions. It is submitted that the Appellant vide Affidavit dated 08.06.2025 and again vide Affidavit dated 20.01.2026 submitted to the Hon'ble NGT its then status of compliance to the 12 directions of the TNPCB with evidences to bring out that the Appellant has in fact complied with 11 (and sought exemption with the Chairman, TNPCB on the 12th direction of Bank Guarantee of Rs.50 lakhs since this guarantee was no longer necessary as the Appellant had complied with all the other improvement directions) of the improvement directions issued by TNPCB vide their Proceedings dated 16.2.2023 and that TNPCB has incorrectly claimed that certain directions were only partially complied and not complied.

2) It is respectfully submitted that V.Anbalagan, Managing Director of the Appellant Industry visited the Tamil Nadu Pollution Control Board, Chennai, Board office on 25.11.2025 and met Shri.Rajendra Babu, ACE and Smt. Indra JCE. During the course of the above meeting, the Appellant's MD was requested by ACE and JCE, TNPCB to meet the JCEE, TNPCB Salem on 26.11.2025 with all evidence related to compliance of TNPCB's 13 directions dated 16.02.2023 issued by the Board and make a request for physical inspection by JCEE and DEE.

3) It is submitted that no inspection was conducted by the JCEE and DEE until 20.01.2026 and TNPCB did not file the report before the Hon'ble National Green Tribunal prior to the

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

last scheduled hearing date of 21.01.2026. The Hon'ble NGT, South Zone, Chennai posted the case for next hearing on 23.02.2026.

4) It is submitted that the Appellant Industry's MD again met the ACE and JCE, TNPCB Chennai on 22.01.2026, and was advised to meet the JCEE, Salem and the DEE, Dharmapuri to prove that the directions have been complied with on a compliance-wise basis.

5) It is submitted that The JCEE, Salem vide his letter dated 05.01.2026 citing Board's letter No.K0.259/Technical/JCEE(k)/TNPCB/Salem/2025-2 dated 05.01.2026 (கடித.எண்.கோ /259/தொ.நுட்பம்/இதசுசூபொ(க)/தநாமாகவா/சேலம்/2025-2நாள் 05.01.2026) stated that with regard to non-submission of our explanation to the instructions issued by the Board on 16.02.2023, directed us to appear at the O/o the DEE, Dharmapuri on 21.01.2026 to offer our explanation **Annexure No. 1**

6) It is submitted that in response to the letter dated 05.01.2026 of the JCEE, Salem, the Appellant vide letter No.VSIPL/TNPCB/2025-26/494 dated 07.01.2026 requested for an alternative date for the personal hearing, informing them that we had to appear before the Hon'ble NGT, Chennai for hearing on the same day i.e. 21.01.2026 in the Appeal filed by us. In that letter, we also provided detailed information including on the Affidavits filed with the Hon'ble NGT and letter to The Chairman, TNPCB on how we had complied with the Board's directions issued in letter dated 16.02.2023. **Annexure No.2**

7) It is submitted that subsequently, the JCEE, through his letter No. K0259/Technical/ JCEE(k)/TNPCB/Salem/2025-2 dated 12.01.2026 (கடித.எண்.கோ/259/தொ.நுட்பம் /இதசுசூபொ(க)/தநாமாகவா/சேலம்/2025-2 நாள் 12.01.2026) **(Annexure No.3)** dropped any mention about the Board's instruction dated 16.02.2023 and provided an

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

alternative date for the personal hearing on 23.01.2026 on a Board's Memo No. T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025 regarding an complaint received against the Industry. **Annexure No.4.**

8) It is submitted that in response to the above letter dated 12.01.2026 of the JCEE, the Appellant vide Letter No.VSIPL/TNPCB/2025-26/503 dated 19.01.2026 requested to provide us the copy of the Board's memo and copies of the alleged continuous complaints so that we could examine them and offer proper explanation during the scheduled personal hearing. **Annexure No. 5**

9) It is submitted that, the JCEE vide letter No. K/259/Technical/JCEE/TNPCB/Salem / 2025 dated .01.2026 (கடித.எண்.கோ / 259 / தொ.நுட்பம் / இதசுசூபொ(க) / தநாமாகவா / சேலம் / 2025 நாள் 22.01.2026) once again confirmed the date of the personal hearing on 23.01.2026 at the Office of the DEE, Dharmapuri as already proposed and informed that the copy of the Board's memo and complaints would be provided during the hearing. **Annexure No. 6**

10) It is submitted that during the personal hearing, all details as to compliance of the directions with evidence as demanded by the JCEE, relating to the 5 of the directions (stated by TNPCB to be either Partially or Not Complied) given in TNPCB Proceedings dated 16.02.2023 and reiterated in the Board's Memo No.T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025 were explained and a Minutes of Meeting dated 23.01.2026 was issued seeking documents on these 5 directions along with supporting evidence **Annexure No. 7**

11) It is submitted that accordingly, the Appellant vide letter No. VSIPL/TNPCB/MS/Chennai/2025-26/512 dated 29.01.2026 submitted reply providing supporting documents to prove compliance in respect to the five directions stated to be non-

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

complied and partially complied along with evidence in the form of photographs, and videos (Pen Drive), addressed to the DEE, Dharmapuri, and the Member Secretary, TNPCB, Chennai and also submitted response against the continuous false complaints stated to be made by P.Suresh against our industry. It is submitted that the Appellant also requested for an inspection of the factory by TNPCB and a report to the Hon'ble NGT before the next hearing on 23.02.2026. **Annexure No. 8.**

12) It is submitted that on 11th and 12th February, the Appellant's MD once again met the Chairman, Member Secretary, ACE, and JCE at the TNPCB office in Chennai, and thoroughly explained the details of those 5 directions which TNPCB had earlier stated to be partially complied and non-complied and also about the artificial complaint made by P. Suresh solely aiming at extorting a large sum of money from our factory supported with documents, photographs, and videos.

It is respectfully submitted that the records/evidences submitted by us alongwith the Annexures 1 to 8 of this Affidavit would bring out that on our part there is no non-compliance/partial compliance of the directions issued by TNPCB vide their Letters/Proceedings dated 17.10.2022, 08.11.2022, and 16.02.2023.

It is respectfully submitted that the Appellant Company's credit facilities with our Bank is under threat of withdrawal leading to financial collapse of the Industry as the Banker has been continuously demanding a consent order from TNPCB for continuation of their credit facilities as the last consent order of TNPCB had lapsed way back in 2021.

Therefore, it is humbly prayed that this Hon'ble National Green Tribunal (NGT) may be pleased to pass such further order or other orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstance of this case and thus render justice to save this rural agro based exporting industry.

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

Annexure 1

6

LiFE Lifestyle for Environment

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்

அனுப்புநர்

திரு.கு. இரவிச்சந்திரன், எம்.இ.,
இணை தலைமை சுற்றுச்சூழல் பொறியாளர் (க)
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
ச.எண்.46/3பி–3 (முதல் தளம்),
தமிழ்நாடு வீட்டு வசதி வாரியம் (லே அவுட்),
இ.பி.எப்.ஒ அலுவலகம் (பின்புறம்),
தளவாய்ப்பட்டி அஞ்சல், சேலம் வட்டம் (மே),
சேலம் மாவட்டம் – 636 302.

பெறுநர்

நிர்வாக இயக்குநர்,
தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீரீஸ் (பி) லிமிடெட்,
எண்.7/114–126,
அலமேலுபுரம் கிராமம்,
பாப்பிரெட்டிப்பட்டி வட்டம்,
தருமபுரி மாவட்டம்.
மின்னஞ்சல் முகவரி office@varalakshmistarch.com
அலைபேசி எண்: 9442613174 (ம) 9442133794

கடிதஎண். கோ.259/தொ.நுட்பம்/இதசசூபொ(க)/தநாமாகவா/சேலம்/2025–2 நாள்: 05.01.2026

ஐயா,

பொருள்: த.நா.மா.க.வாரியம் – இணை தலைமை சுற்றுச்சூழல் பொறியாளர்(க) அலுவலகம், சேலம் – தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுரம் கிராம பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீரீஸ் (பி) லிமிடெட் – வாரியம் வழங்கிய உத்தரவுகளுக்கு உரிய விளக்கம் அளிக்கப்படாதது – நேரடி விசாரணைக்கு அழைப்பது – தொடர்பாக.

பார்வை: Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated: 26.12.2025

பார்வையில் கண்டுள்ள வாரிய குறிப்பாணையின்படி, தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுர கிராம பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீரீஸ் (பி) லிமிடெட் என்ற தங்களுடைய நிறுவனத்திற்கு வாரிய தலைமை அலுவலகத்திலிருந்து 16.02.2023 அன்று தேதியிட்ட உருத்துக்கட்டளைகளுக்கு தங்களிடமிருந்து உரிய விளக்கம் அளிக்கப்படாதது குறித்து 21.01.2026 அன்று காலை 11.00 மணிக்கு மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்தை நேரில் அணுகி தங்களது தரப்பு விளக்கங்களை அளிக்குமாறு அன்புடன் கேட்டுக்கொள்ளப்படுகிறது.

5.1.26

இணை தலைமை சுற்றுச்சூழல் பொறியாளர்(க),
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், சேலம்.

5/1/26

நகல்
மாவட்ட சுற்றுச்சூழல் பொறியாளர்,
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
தருமபுரி – தேவையான அனைத்து ஏற்பாடுகளையும் மேற்கொள்ளுமாறு அறிவுறுத்தப்படுகிறது.

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Translated English Copy Annexure No. 1 of Page No.6 of the Affidavit

TAMILNADU POLLUTION CONTROL BOARD

FROM

Er. G. Ravichandran, M.E.,
The Joint Chief Environmental Engineer (K)
Tamilnadu Pollution Control Board,
S.F.No.46/3B-3, Ist Floor,
TNHB Layout (Behind EPFO Office),
Thalaivaipatty Post,
Salem Taluk (West)
Salem District-636302.

TO

The Managing Director
M/s. Varalakshmi Starch Industries Pvt. Ltd.,
No. 7/114-126, Alamelupuram Village,
Pappireddipatty Post,
Dharampuri District
Email: office@varalakshmistarch.com
Mobile :94426 13174 / 94421 33794

Letter No. K0259/Technical/JCEE(K)/TNPCB/Salem/2025-2 date: 05 .01.26

Sir,

Sub : TNPCB – JCEE (K) Office, Salem- Unit located at Dharmapuri District, Papireddypatty Post, Alamaelupuram Village Ms/. Varalakshmi Starch Industries Private Ltd. – Non submission of explanation to the directions issued by the Board – Calling to appear in person – Reg.

Ref. : 1. Board's Memo No. T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025

As per the direction by the Board under reference cited above with regard to the non submission of your explanation to injunction issued by the Board in their letter dt. 16.02.2023 to your Industry located at Alamaelupuram Village, Papireddypatty Taluk, Dharmapuri district, you are requested appear at the DEE, TNPCB Dharmapuri on 21.01.2026 at 11 a.m. and offer your explanation.

JCEE(K)
TNPCB SALEM

Copy to
District Environmental Engineer, TNPCB, Dharmapuri with instructions to make required arrangements.

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

Annexure 2

VARALAKSHMI STARCH INDUSTRIES (P) LTD.

8

MRFS. & EXPORTERS : SUPER HIGH GRADE TAPIOCA SAGO, TAPIOCA STARCH, MAIZE STARCH, MODIFIED STARCHES & SAGO PAPADS

VSIPL/TNPCB/2025-26/494 Date : 07/01/2026

To
Mr.K.Ravichandran, M.E
Joint Chief Environmental Engineer,
Tamil Nadu Pollution Control Board,
S.No.46/B-3 (First Floor),
Tamil Nadu Housing Board (Layout), E.P.F.O Office (Backside).
Thalavaaipatti Post, Salem Taluk (West),
Salem District – 636 302

Respected Sir,

Sub: Your letter requesting us to present ourselves before the DEE, Dharmapuri on 21.01.2026 at 11.00 am with regard to the Proceeding No. TNPCB/T2/F.0225102/ Directions/Water/2023 dt 16.02.2023 – Regarding.

Ref:

1. Your letter No. கோ.259/தொ.நுட்பம்/இதசூபொ(க)/தநாமாகவா/சேலம்/2025-2 நாள்:05.01.2026 மின்னஞ்சல் மூலம் பெறப்பட்டது.
2. Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated:26.12.2025.
3. Proceeding No. TNPCB/T2/F.025102/Directions/Water/2022 dated 17/10/2022
4. Our reply vide No. VSIPL/PCB/2022-23/343/RPAD dated 28/10/2022 in response to your proceedings dated 17/10/2022, sent by RPAD and email on 29/10/2022 addressed to The Chairperson, TNPCB and Copy Marked to the JCEE, Salem.
5. Proceeding No. TNPCB/T2/F.025102/DMP/Closure/Water/2022 dated 08/11/2022.
6. Proceeding No. TNPCB/T2/F.0225102/Directions/Water/2023 dt 16.02.2023 received by us on 18.02.2023.
7. Our submission letter No.VSIPL/PCB/2022-23/498/RPAD dated 02.03.2023.
8. Our reply Letter No. VSIPL/PCB/2023-24/266 dated 29.12.2023.
9. Our Affidavit submitted on 09.03.2023 in response to your proceeding dated 16.02.2023 to the Honourable NGT South Zone, Chennai.
10. Our Affidavit submitted on 14.02.2024 in response to your proceeding dated 16.02.2023 to the Honourable NGT South Zone, Chennai.
11. Our Affidavit submitted on 14.12.2024 in response to your proceeding dated 16.02.2023 to the Honourable NGT South Zone. Chennai.
12. Affidavit submitted by TNPCB dated 28.04.2025 to Proceeding No. TNPCB/T2 /F.0225102/Directions/Water/2023 dt 16.02.2023, to the Honourable NGT South Zone Chennai.
13. Our Affidavit submitted on 08.06.2025 in response to your proceeding dated 16.02.2023 to the Honourable NGT South Zone, Chennai.

Regd. Office : " Varalakshmi Tower ", II Floor, No. 127/1, Gandhi Road, Salem - 636 007. T.N. India.
Email : office@varalakshmistarch.com | Mobile : 94426 13174, 94421 33794
Factory : No. 7/114-126, Bommidi Main Road, Pappireddipatti (Po), Dharmapuri Dt. - 636 905.
GSTIN : 33AABCV0094P1Z2 | CIN No. U01532TZ1995PTC006136
www.varalakshmistarch.com

IS : 899 CM/L-6100012769 TAPIOCA SAGO

IS : 1319 CM/L-6299891 TAPIOCA STARCH

Based on TNPCB Board Proceeding No. TNPCB/T2/F.025102/Directions/Water/2022 dated 17.10.2022, we had submitted our point-wise replies along with supporting evidence, including hard copies and photographs, and also requested a personal hearing through our response letter vide No. VSIPL/PCB/2022-23/343/RPAD dated 28.10.2022 sent by RPAD and by email on 29.10.2022 addressed to The Chairman, TNPCB Chennai.

However, the TNPCB issued the Closure Order vide TNPCB Proceeding No. TNPCB/T2/F.025102/DMP/Closure/Water/2022 dated 08.11.2022 by not taking in record our reply for the proceeding dated 17.10.2022 and by also not providing an opportunity of Personal Hearing despite our request which were all acknowledged by TNPCB.

In your above 1st cited letter, a Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated:26.12.2025 has been cited and it has been stated by your goodself that we have not submitted our reply to the TNPCB Board's Proceedings dated 16.02.2023 cited in reference 3rd above and therefore asked us to present ourself before the DEE, Dharmapuri on 21.01.2026 at 11.00am to make our submissions on the same. The 2nd cited TNPCB Board Memo is not available with us and we request you to provide us a copy of the same for our perusal and to make our submissions accordingly.

In this regard, we would like to state that, as per the direction of the Hon'ble NGT, Chennai, the TNPCB Board officials inspected and issued us certain directions vide Proceedings dated 16.02.2023. On receipt of it, we had promptly submitted our replies along with supporting evidence by hard copy, Photos to the Board vide our letter No. VSIPL/PCB/2022-23/498/RPAD dated 02.03.2023 cited in reference No.7 above by RPAD as well as by e-mail on 02.03.2023. Followed up again by Letter No.VSIPL/PCB/2023-24/266 dated 29.12.2023 cited in reference No.8. Further as per the orders of the Hon'ble NGT we have also submitted Affidavits to the Hon'ble NGT, Chennai providing our submissions on the status of the compliances to the directions passed by the TNPCB Board in their proceedings dated 16.02.2023 (cited in reference No.9,10,11 and 13). Based on this, TNPCB officials also inspected our unit and submitted the status of compliance as on 29.01.2025 to the Hon'ble NGT, Chennai through their report filed on behalf of the respondent (TNPCB) on 28.04.2025. In page no. 3 in S.No. 1 of the said TNPCB report, to the direction that "The unit shall furnish a time bound action plan for completing the ETP revamping works, so as to satisfy the treated trade effluent standards prescribed by the Board within a month's time" – **TNPCB has report that the Industry has Complied.**

This being the case, we are surprised to note that our replies submitted dated 28.10.2022 cited in reference No.4, our replies submitted dated 02.03.2023 cited in reference No.7, our replies submitted dated 29.12.2023 cited in reference No.8 till date to the TNPCB and the various affidavits submitted to the Hon'ble NGT on your proceedings dated 16.02.2023 have been omitted in your 1st cited letter.

Though we are willing to make ourself available at the office of the DEE, TNPCB Dharmapuri on 21.01.2026, our Appeal No.77/2022 filed against the closure order is listed for hearing before the Hon'ble NGT on the same day on 21.01.2026 at Chennai as per the Orders of the Hon'ble NGT, Chennai dated 16.12.2025 for which I have to appear as the party in person. Therefore, kindly reschedule our appearance before the DEE, TNPCB to any other date after 21.01.2026 and oblige.

Thanking You,

Yours sincerely,
For Varalakshmi Starch Industries Pvt Limited,

(V.Anbalagan)
Managing Director

Annexure 3

11

3

LiFE
Lifestyle for Environment

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்

அனுப்புநர்

திரு.கு. இரவிச்சந்திரன், எம்.இ.,
இணை தலைமை சுற்றுச்சூழல் பொறியாளர் (க)
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
ச.எண்.46/3பி–3 (முதல் தளம்),
தமிழ்நாடு வீட்டு வசதி வாரியம் (லே அவுட்),
இ.பி.எப்.ஒ அலுவலகம் (பின்புறம்),
தளவாய்ப்பட்டி அஞ்சல், சேலம் வட்டம் (மே),
சேலம் மாவட்டம் – 636 302.

பெறுநர்

நிர்வாக இயக்குநர்,
தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீரீஸ்
(பி) லிமிடெட்,
எண்.7/114–126,
அலமேலுபுரம் கிராமம்,
பாப்பிரெட்டிப்பட்டி வட்டம்,
தருமபுரி மாவட்டம்.
மின்னஞ்சல் முகவரி office@varalakshmistarch.com
அலைபேசி எண்: 9442613174 (ம) 9442133794

கடித எண். கோ.259/தொ.நுட்பம்/இதசுசூபொ(க)/தநாமாகவா/சேலம்/2025–2 நாள்:12.01.2026

ஐயா,

பொருள்: த.நா.மா.க.வாரியம் – இணை தலைமை சுற்றுச்சூழல் பொறியாளர் (க) அலுவலகம், சேலம் – தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுரம் கிராம பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீரீஸ் (பி) லிமிடெட் குறித்து – நேரடி விசாரணை– மறு தேதி நிர்ணயித்தல்- தொடர்பாக.

பார்வை:
1. Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated: 26.12.2025
2. இவ்வலுவலக கடித எண். கோ.259/தொ.நுட்பம்/ இதசுசூபொ(க)/ தநாமாகவா/ சேலம்/2025–2 நாள்:12.01.2026
3. தங்களது கடித நாள் 07.01.2026 இவ்வலுவலகத்தில் பெறப்பட்ட நாள் 08.01.2026

பார்வை 1–ல் கண்டுள்ள வாரிய குறிப்பாணையின்படி, தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுர கிராமப் பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்ட்ரீஸ் (பி) லிமிடெட் என்ற தங்களுடைய நிறுவனத்தினால் சுற்றுச்சூழல் பாதிப்பு ஏற்படுவதாக தொடர்ச்சியாக பெறப்படும் புகார்கள் குறித்து உரிய விளக்கம் பெறுவது பொருட்டு தாங்கள் 21.01.2026 அன்று மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்திற்கு வருகை புரிய பார்வை 2–ன் வாயிலாக கேட்டுக்கொள்ளப்பட்டது.

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இந்நிலையில், மாண்புமிகு தேசிய பசுமைத் தீர்ப்பாயம் சென்னையில் தங்களால் மேற்கொள்ளப்பட்ட மேல்முறையீடு மனு எண் 77/2022–ன் வழக்கு விசாரணைக்கு தாங்கள் மாண்புமிகு தேசிய பசுமைத் தீர்ப்பாயத்திற்கு 21.01.2026 அன்று செல்ல வேண்டியிருப்பதாக 07.01.2026 தேதியிட்ட தங்களுடைய கடிதம் மூலம் தெரிவித்திருப்பதால் 23.01.2026 அன்று காலை 11.00 மணிக்கு மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்திற்கு வருகை புரிந்து, தங்களது விளக்கங்களை அளிக்குமாறு அன்புடன் கேட்டுக்கொள்ளப்படுகிறது.

12.1.26

இணை தலைமை சுற்றுச்சூழல் பொறியாளர்(க),
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், சேலம்.

நகல்
மாவட்ட சுற்றுச்சூழல் பொறியாளர்,
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
தருமபுரி– தேவையான அனைத்து ஏற்பாடுகளையும் மேற்கொள்ளுமாறு அறிவுறுத்தப்படுகிறது.

12/1/26

Translated English Copy Annexure No. 3 of Page No. 11,12 of the Affidavit

13

TAMILNADU POLLUTION CONTROL BOARD

FROM

Er. G. Ravichandran, M.E.,
The Joint Chief Environmental Engineer (K)
Tamilnadu Pollution Control Board,
S.F.No.46/3B-3, Ist Floor,
TNHB Layout (Behind EPFO Office),
Thalaivaipatty Post,
Salem Taluk (West)
Salem District-636302.

TO

The Managing Director
M/s. Varalakshmi Starch Industries Pvt. Ltd.,
No. 7/114-126, Alamelupuram Village,
Pappireddipatty Post,
Dharampuri District
Email: office@varalakshmistarch.com
Mobile :94426 13174 / 94421 33794

Letter No. K0259/Technical/JCEE(K)/TNPCB/Salem/2025-2 date 12.01.26

Sir

Sub : TNPCB – JCEE (K) Office, Salem- Unit located at Dharmapuri District, Papireddypatty Post, Alamaelupuram Village Ms/. Varalakshmi Starch Industries Private Ltd. – Personal – Enquiry – Fixing another date – Reg.

Ref. : 1. Board's Memo No. T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025
2. This Office Letter No. Ko. 259/Technical/JCEE(K)/TNPCB/Salem/2025-2 dated 12.01.2026
3. Your Letter Dated 07.01.2026 received at this office on 08.01.2026.

As per the Board's Directions in letter cited under reference (1) above, you were asked to appear in person on 21.01.2026 at the office of the DEE,TNPCB, Dharmapuri to offer explanation regarding the continuous complaints about the environmental pollution said to be caused by the industry M/s Varalakshmi Starch Industries Private Limited located at Alamaelupuram Village, Papireddypatty Post, Dharmapuri District) vide the letter cited under reference (2) above.

In this Situation, since you have informed through your letter Dt : 07.01.2026 that you had to appear before the Hon'ble National Green Tribunal, Chennai for the hearing on 21.01.2026 in the Appeal No. 77/2022 filed by you before the Hon'ble National Green Tribunal, Chennai, you are requested to appear at the office of the DEE, Dharmapuri on 23.01.2026 at 11.30 AM and offer your explanation.

JCEE(K)
TNPCB SALEM

Copy
District Environmental Engineer, TNPCB, Dharmapuri with instructions to make required arrangements.

For Varalakshmi Starch Industries (P) Ltd

(V.ANBALAGAN)
Managing Director

Annexure 4 14

LiFE Lifestyle for Environment

TAMIL NADU POLLUTION CONTROL BOARD

Memo No. T4 / TNPCB / F. 015306 / Complaint / 2025, Dated: 26.12.2025

Sub: TNPC Board – Industries – M/s. Varalakshmi Starch Industries, located at Pappireddipatti & Alamelupuram Village, Pappireddipatti Taluk, Dharmapuri District– Non compliances for the directions issued– Personal hearing to be conducted - Reg.

Ref:
1) Board's Proc. No. TNPCB / T2 / F.025102 / DMP / Direction / Water / 2023, dated: 16.02.2023.
2) Board's memo No. T4 / TNPCB / F.015306 / Complaint / 2025, dated:17.11.2025.
3) DEE's Lr. No.DEE/TNPCB/DMP/F.DMP0013/OL/2025, Dated: 21.11.2025.
4) JCEE(M)'s Lr.No: F.259 / Tech / JCEE(M) / TNPCB / SLM / 2025, Dated:09.12.2025.

****

The attention of the Joint Chief Environmental Engineer, Salem is invited to the references 2nd cited, wherein stated that the JCEE (M), Salem, to inspect the unit along with the DEE, Dharmapuri and to furnish remarks & recommendation. Subsequently, the unit was inspected along with DEE, Dharmapuri on 11.11.2025 and submitted reference 4th cited above, wherein it has recommended that the unit authority may be called for personal hearing at the Board level to comply with entire direction since the unit has partially complied with the Board's directions dated 16.02.2023, while certain directions remain uncomplied and also complaints are being received frequently from Thiru. Suresh (Petitioner in O.A. No. 47 of 2023) in every month against the unit M/s. Varalakshmi Starch Industries Pvt. Ltd.

In this regard, the following conditions imposed in board direction are yet to be complied,

a. The unit shall furnish a time bound action plan to replace all the Seemai Karuvelam trees in the premises with the native species as recommended by the Agriculture Department along with the proposal for safe disposal of entire quantity of treated effluent with adequate green belt area within 15 days.— **Partially Complied**

b. The unit shall furnish the layout of the premises marking the green belt area that are being maintained for utilization of treated effluent along with the plantation details such as number of plants, name of the plants species, plantation area etc. within 15 days **- Partially Complied.**

c. The unit shall conduct water and wastewater audit through reputed institution like Anna university, Chennai/IIT Madras and furnish report to the Board. The time bound action plan for the same shall be furnished within a month's time, as the unit has made payment to the Anna University, Chennai to carry out ETP Adequacy study only and not for the water and wastewater audit as directed by the Board vide proceeding dated 17.10.2022—**Not Complied**

No. 76, MOUNT SALAI, GUINDY, CHENNAI - 600 032.
Tel : 044-22353134 - 139 Fax : 044-22353068
Email : tnpcb-chn@gov.in Web : tnpcb.gov.in

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d. The unit shall conduct ground water quality study through reputed institution like Anna university, Chennai/IIT Madras in the green belt areas that are being maintained utilizing the treated effluent and furnish the report to the Board within a month's time—**Not Complied**

e. In order to ensure the compliance of all the above said directions 1 to 11, the unit shall furnish a Bank Guarantee for Rs.50 Lakhs valid for one year to the TNPCB within a month's time (Format enclosed) —Not Complied.

f. Further, the unit had filed before the Hon'ble NGT (SZ), in Appeal No. 77 of 2022 & the complainant Thiru. Suresh has also filed Hon'ble NGT (SZ) in O.A. No. 47 of 2023.Now, both cases are merged & pending before the Hon'ble NGT(SZ) and the case is under trial.

In view of the above, the JCEE (M), TNPCB, Salem along with DEE, Dharmapuri is instructed to conduct a personal hearing at the first instance with the unit authority of M/s.Varalakshmi Starch Industries Pvt. Ltd & petitioner Thiru. Suresh with respect to the compliance of the Board direction dated 16.02.2023 and furnish the action taken report to the Board at the earliest, so as to take further necessary action in the matter.

The receipt of this letter shall be acknowledged.

Sd/- 26/12/25

For Member Secretary

To

The Joint Chief Environmental Engineer,
Tamil Nadu Pollution Control Board,
Salem.

Copy to

The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Dharmapuri.

Annexure 5

VARALAKSHMI STARCH INDUSTRIES (P) LTD.

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MRFS. & EXPORTERS : SUPER HIGH GRADE TAPIOCA SAGO, TAPIOCA STARCH, MAIZE STARCH, MODIFIED STARCHES & SAGO PAPADS

VSIPL/TNPCB/2025-26/503 Date : 19/01/2026

To
Mr.K.Ravichandran, M.E
Joint Chief Environmental Engineer,
Tamil Nadu Pollution Control Board,
S.No.46/B-3 (First Floor),
Tamil Nadu Housing Board (Layout), E.P.F.O Office (Backside).
Thalavaaipatti Post, Salem Taluk (West),
Salem District – 636 302

Respected Sir,

Sub: Your letter requesting us to present ourselves before the DEE, Dharmapuri on 21.01.2026 at 11.00 am with regard to the Proceeding No. TNPCB/T2/F.0225102/ Directions/Water/2023 dt 16.02.2023 – Regarding.

Ref:

1. Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated:26.12.2025.
2. **Your letter No.** கோ.**259** / தொ.நுட்பம் /இதசூபொ(க)/ தநாமாகவா /சேலம்/ **2025-2** நாள்:**05.01.2026** மின்னஞ்சல் மூலம் பெறப்பட்டது
3. Our Rply In VSIPL/TNPCB/2025-25/494 dated 07.01.2026
4. **Your letter No.** கோ.**259** / தொ.நுட்பம் / இதசூபொ(க) / தநாமாகவா /சேலம் / **2025-2** நாள்:**12.01.2026** மின்னஞ்சல் மூலம் பெறப்பட்டது.

Based on the Board Memo cited in reference No. 1. We are directed for a personal hearing on 21.01.2026 vide your letter cited in Reference. No. 2, stating that we have not submitted clarifications for the injunction proceedings No. TNPCB/T2 / F.0225102 /Directions / Water/2023 dated 16.02.2023 for which we have informed you vide our letter dated 07.01.2026 cited in reference No.3 that we could not present on 21.1.2026 due to the hearing in NGT is scheduled on the same day. .We have also requested you to furnish a copy of the Board's Memo No. T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025

Regd. Office : " Varalakshmi Tower ", II Floor, No. 127/1, Gandhi Road, Salem - 636 007. T.N. India.
Email : office@varalakshmistarch.com | Mobile : 94426 13174, 94421 33794
Factory : No. 7/114-126, Bommidi Main Road, Pappireddipatti (Po), Dharmapuri Dt. - 636 905.
GSTIN : 33AABCV0094P1Z2 | CIN No. U01532TZ1995PTC006136
www.varalakshmistarch.com

IS : 899 CM/L-6100012769 TAPIOCA SAGO

IS : 1319 CM/L-6299891 TAPIOCA STARCH

Vide your reply dated 12.01.2026 cited in reference No. 4, we are directed us to appear in person seeking clarifications for the complaints received from the public.

Even though both your letters dated 05.01.2026 and 12.01.2026 are based on the Board Memo cited in Reference No. 1, but totally different from one another viz., one is for seeking clarifications for the Proceeding dated 16.2.2023 and another one is for the public complaints.

We are totally confused whether the personal hearing is for the Proceedings dated 16.02.2023 or for the public complaints.

You are directing the MD of a reputed Large Scale Industry who is the core in charge for his entire industry for a personal hearing and if at all the requested copies of the documents are furnished we could not understand firmly on what grounds you are directing the personal hearing.

We request you to furnish all the copies of all the public complaints and copy of the Board Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated:26.12.2025. so as to know the details of the public complaints and on what grounds the personal hearing is directed by the Board and to enable us to present for personal hearing with valid submissions and records

Hence, we request you to postpone the hearing granting 10 days' time from furnishing us the copies of the public complaints and copy of the Board Memo cited in Reference No. 1

Thanking You,

Yours sincerely,
For Varalakshmi Starch Industries Pvt Limited,

(V.Anbalagan)
Managing Director

C.C.: - 1. The Chair Person, TNPCB, Chennai
2. Member Secretary, TNPCB, Chennai
3. DEE, TNPCB, Dharmapuri

Annexure 6

18

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்

அனுப்புநர்

திரு.கு. இரவிச்சந்திரன், எம்.இ.,
இணை தலைமை சுற்றுச்சூழல் பொறியாளர் (க)
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
ச.எண்.46/3பி–3 (முதல் தளம்),
தமிழ்நாடு வீட்டு வசதி வாரியம் (லே அவுட்),
இ.பி.எப்.ஒ அலுவலகம் (பின்புறம்),
தளவாய்ப்பட்டி அஞ்சல், சேலம் வட்டம் (மே),
சேலம் மாவட்டம் – 636 302.

பெறுநர்

நிர்வாக இயக்குநர்,
தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீஸ்
(பி) லிமிடெட்,
எண்.7/114–126,
அலமேலுபுரம் கிராமம்,
பாப்பிரெட்டிப்பட்டி வட்டம்,
தருமபுரி மாவட்டம்.
மின்னஞ்சல் முகவரி office@varalakshmistarch.com
அலைபேசி எண்: 9442613174 (மு) 9442133794

கடித எண். கோ.259/தொ.நுட்பம்/இதசுசூபொ(க)/தநாமாகவா/சேலம்/2025 நாள்: .01.2026

ஐயா,

பொருள்: த.நா.மா.க.வாரியம் – இணை தலைமை சுற்றுச்சூழல் பொறியாளர் (க) அலுவலகம், சேலம் – தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுரம் கிராம பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்டீஸ் (பி) லிமிடெட் குறித்து – நேரடி விசாரணை– மறு தேதி நிர்ணயித்தல்- தொடர்பாக.

பார்வை:

1. Board's Memo No.T4/TNPCB/F.015306/Complaint/2025, Dated: 26.12.2025
2. இவ்வலுவலக கடித எண். கோ.259/தொ.நுட்பம்/ இதசுசூபொ(க)/ தநாமாகவா/ சேலம்/2025–2 நாள்:12.01.2026
3. தங்களது கடித நாள் 19.01.2026 இவ்வலுவலகத்தில் பெறப்பட்ட நாள் 20.01.2026

பார்வை 1–ல் கண்டுள்ள வாரிய குறிப்பாணையின்படி, தருமபுரி மாவட்டம், பாப்பிரெட்டிப்பட்டி வட்டம், அலமேலுபுர கிராமப் பகுதியில் அமைந்துள்ள தி/ள். வரலட்சுமி ஸ்டார்ச் இன்டஸ்ட்ரீஸ் (பி) லிமிடெட் என்ற தங்களுடைய நிறுவனத்தினால் சுற்றுச்சூழல் பாதிப்பு ஏற்படுவதாக தொடர்ச்சியாக பெறப்படும் புகார்கள் மற்றும் தமிழ்நாடு மாசு கட்டுப்பாட்டு வாரியத்தால் வழங்கப்பட்ட சில நிபந்தனைகளை இன்னும் நிறைவேற்றாதது குறித்து உரிய விளக்கம் பெறுவது பொருட்டு தாங்கள் 21/01/2026 அன்று மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாக கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்திற்கு வருகை புரியுமாறு பார்வை 2–ன் வாயிலாக கோரப்பட்டிருந்தது.

19

இந்நிலையில், மாண்புமிகு தேசிய பசுமைத் தீர்ப்பாயம் சென்னையில் தங்களால் மேற்கொள்ளப்பட்ட மேல்முறையீடு மனு எண் 77/2022–ன் வழக்கு விசாரணைக்கு தாங்கள் மாண்புமிகு தேசிய பசுமைத் தீர்ப்பாயத்திற்கு 21.01.2026 அன்று செல்ல வேண்டியிருப்பதாக 07.01.2026 தேதியிட்ட தங்களுடைய கடிதம் மூலம் தெரிவித்திருந்ததால் 23.01.2026 அன்று காலை 11.00 மணிக்கு மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்திற்கு வருகை புரிந்து, தங்களது விளக்கங்களை அளிக்குமாறு கோரப்பட்டிருந்தது.

இதற்கிடையில் தங்களால் 19.01.2026 தேதியிட்ட கடிதத்தில் சில ஆவணங்களை கேட்டுக் கொண்டதுடன் 10 நாட்கள் அவகாசம் வழங்குமாறும் கோரப்பட்டிருக்கிறது.

இந்நிலையில், ஏற்கனவே உத்தேசித்தவாரே 23.01.2026 அன்று காலை 11.00 மணிக்கு மாவட்ட சுற்றுச்சூழல் பொறியாளர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், தருமபுரி அலுவலகத்திற்கு வருகை புரிந்து தமிழ்நாடு மாசு கட்டுப்பாட்டு வாரியத்தால் 16.02.2023 தேதி வழங்கப்பட்ட ஆணையின் சில நிபந்தனைகளை முழுவதும் நிறைவேற்றாதது குறித்து உரிய விளக்கத்தை தெரிவிக்குமாறு அன்புடன் கேட்டுக் கொள்ளப்படுகிறது. தங்களின் வருகையின் போது தங்களுக்கு தேவையான தகவல்கள்/கோப்புக்கள் தேவைப்பட்டால் பெற்றுக் கொள்ளலாம் என்பது தெரிவித்துக்கொள்ளப்படுகிறது.

22.1.26

இணை தலைமை சுற்றுச்சூழல் பொறியாளர்(க),
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், சேலம்.

22/1/26

நகல்
மாவட்ட சுற்றுச்சூழல் பொறியாளர்,
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
தருமபுரி– தேவையான அனைத்து ஏற்பாடுகளையும் மேற்கொள்ளுமாறு அறிவுறுத்தப்படுகிறது.

Translated English Copy Annexure No. 6 of Page No. 18,19 of the Affidavit

TAMILNADU POLLUTION CONTROL BOARD

20

FROM

Er. G. Ravichandran, M.E.,
The Joint Chief Environmental Engineer (K)
Tamilnadu Pollution Control Board,
S.F.No.46/3B-3, Ist Floor,
TNHB Layout (Behind EPFO Office),
Thalaivaipatty Post,
Salem Taluk (West)
Salem District-636302.

TO

The Managing Director
M/s. Varalakshmi Starch Industries Pvt. Ltd.,
No. 7/114-126, Alamelupuram Village,
Pappireddipatty Post,
Dharampuri District
Email: office@varalakshmistarch.com
Mobile :94426 13174 / 94421 33794

Letter No. K0259/Technical/JCEE(K)/TNPCB/Salem/2025 date .01.26

Sir

Sub : TNPCB – JCEE (K) Office, Salem- Unit located at Dharmapuri District, Papireddypatty Post, Alamaelupuram Village Ms/. Varalakshmi Starch Industries Private Ltd. – Personal – Enquiry – Fixing another date – Reg.

Ref. : 1. Board's Memo No. T4/TNPCB/F.015306/Complaint/2025 dated 26.12.2025
2. This Office Letter No. Ko. 259/Technical/JCEE(K)/TNPCB/Salem/2025-2 dated 12.01.2026
3. Your Letter Dated 19.01.2026 received at this office on 20.01.2026.

As per the Board's Directions in letter cited under reference (1) above, you were asked to appear in person on 21.01.2026 at the office of the DEE,TNPCB, Dharmapuri to offer explanation regarding the continuous complaints about environmental pollution said to be caused by the industry M/s VSIPL located at Alamaelupuram Village, Papireddypatty (TK), Dharmapuri District and also about the non- compliance of certain Directions issued by the TNPCB vide letter cited under reference (2) above.

In this Situation, since you have informed through your letter Dt : 07.01.2026 that you had to appear before the Hon'ble National Green Tribunal for the hearing on 21.01.2026 in the Appeal No. 77/2022 filed by you before the Hon'ble National Green Tribunal, Chennai, you were requested to appear before the office of the DEE, Dharmapuri on 23.01.2026 at 11.30 AM and offer your explanation.

In the meantime, vide your letter Dt : 19.01.2026, you have requested to provide certain documents and also for grant of 10 days time.

In this situation, as already proposed, you are requested appear at the office of the DEE, Dharmapuri on 23.01.2026 at 11.00 AM and offer explanation about non- compliance of certain directions issued by TNPCB in its order issued on 16.02.2023. You may obtain information / documents required if any while appearing in person.

For Varalakshmi Starch Industries (P) Ltd

JCEE(K)
TNPCB SALEM

(V. ANBALAGAN)
Managing Director

Copy to
District Environmental Engineer, TNPCB, Dharmapuri with instructions to make required arrangements.

Annexure 7

21

Personal Hearing conducted	:	23.01.2026
Participant Name & Address	:	Thiru.V. Anbalagan, Managing Director, M/s. Varalakshmi Starch Industries Pvt. Ltd., Varalakshmi Tower, 2nd Floor, 127/1 Gandhi Road Salem - 636 007 Ph: 9843033174
Reference	:	இணை தலைமை சுற்றுச்சூழல் பொறியாளர் க.எண்:கோ.259/தொ.நுட்பம்/இதசுசூபொ(க)/தநாமாகவா/ சேலம்/2025-2 நாள் : 12.01.2026.
Presiding Officer	:	The Joint Chief Environmental Engineer(M), TNPCB, Salem

With reference to the Board's Memo No. T4/TNPCB/F.015306/Complaint/ 2025 Dt: 26.12.2025, Personal Hearing was conducted on 23.01.2026 under the Head of the Joint Chief Environmental Engineer(M), TNPCB, Salem to discuss about the non-compliance of the conditions imposed to the M/s. Varalakshmi Starch Industries Pvt. Ltd., by the Board vide Dt: 16.02.2023.

During personal hearing, Thiru.V. Anbalagan, Managing Director of the above said unit, has discussed about the unit's present status of compliance of the direction issued by the Board and assured to furnish the following supporting documents

1. Updated time bound action plan for Green Belt development
2. Plan Layout for marking Green Belt area for utilization of treated effluent with Name, No. of species and plantation area
3. Ground Water Quality report
4. Water and Waste water audit report
5. Exemption letter for the Bank Guarantee

23/1/2026
Thiru.V. Anbalagan,
Managing Director,

23/01/26
AEE,
O/o.DEE,TNPCB,DMP

A. No
DEE(a/c) 23/1/26
O/o.DEE,TNPCB,DMP

23.1.26
JCEE(M)
TNPCB, SLM

Annexure 8

OC

VARALAKSHMI STARCH INDUSTRIES (P) LTD.

22

MRFS. & EXPORTERS : SUPER HIGH GRADE TAPIOCA SAGO, TAPIOCA STARCH, MAIZE STARCH, MODIFIED STARCHES & SAGO PAPADS

VSIPL/TNPCB/MS/Chennai/2025-26/512 Date: 29.01.2026

To:

The Member Secretary
Tamil Nadu Pollution Control Board,
No. 76 Mount Salai,
Guindy,
Chennai - 600 032.

Respected Sir,

Sub: Personal Hearing before the JCEE (M), TNPCB, Salem, DEE,TNPCBDharmapuri, AEE Dharmapuri on 23.01.2026 at 11.00 a.m. – Regarding Proceedings No. TNPCB/T2/F.0225102/Directions/Water/2023 dated 16.02.2023 –Based on the Board Memo on 14/TNPCB/015306/Compliant/2025 Date 26.12.2025.

Ref:

1. Board's Memo No. T4/TNPCB/F.015306/Complaint/2025, dated 26.12.2025.
2. Your letter No. கோ.259 / தொ.நுட்பம் / இதசூபொ(க) / தநாமாகவா / சேலம் / 2025-2 dated 05.01.2026, received through email.
3. Our reply vide letter No. VSIPL/TNPCB/2025-25/494 dated 07.01.2026.
4. Your letter No. கோ.259 / தொ.நுட்பம் / இதசூபொ(க) / தநாமாகவா / சேலம் / 2025-2 dated 12.01.2026, received through email.
5. Our reply vide letter No. VSIPL/TNPCB/2025-25/503 dated 19.01.2026.
6. Your letter No. கோ.259 / தொ.நுட்பம் / இதசூபொ(க) / தநாமாகவா / சேலம் / 2025 dated _.01.2026, received through email on 22.01.2026.
7. Personal Hearing conducted by the JCEE (M), TNPCB, Salem; In-charge DEE, TNPCB, Salem; and AEE, TNPCB, Dharmapuri on **23.01.2026** from **11.00 a.m. to 2.30 p.m.**, regarding the proceedings No. **TNPCB / T2 / F.0225102 / Directions / Water / 2023** dated **16.02.2023** and requested 5 Supporting Documents.
8. Compliant from P.Suresh copy not given by the TNPCB, Dharmapuri. So our submission based on oral information given by the JCEE(M), Salem during the Personal Hearing for the Complaint Grounds in the PH Date 23.01.2026.
9. Board's Memo No. T4/TNPCB/F.015306/Compliant/2025 dated 17.11.2025 (Copy not given to us).
10. **DEE's Lr. No.DEE/TNPCB/DMP/F.DMP0013/OL/2025, Dated:21.11.2025**(Copy not given to us).

29 JAN 2026

Regd. Office : " Varalakshmi Tower ", II Floor, No. 127/1, Gandhi Road, Salem - 636 007. T.N. India.
Email : office@varalakshmistarch.com | Mobile : 94426 13174, 94421 33794
Factory : No. 7/114-126, Bommidi Main Road, Pappireddipatti (Po), Dharmapuri Dt. - 636 905.
GSTIN : 33AABCV0094P1Z2 | CIN No. U01532TZ1995PTC006136
www.varalakshmistarch.com

IS : 899 CM/L-6100012769 TAPIOCA SAGO

IS : 1319 CM/L-6299891 TAPIOCA STARCH

11. JCEE (M)'s Lr. No: F.259 / Tech /JCEE(M) /TNPCB /SLM /2025, Dated: 09.12.2025(Copy not given to us).

12. **P.Sureshcompliants copy** (Copy not given to us).

With reference to 6 above, we were directed to appear for a personal hearing on 23.01.2026. Accordingly, the Personal Hearing was held before the Joint Chief Environmental Engineer (M), TNPCB, Salem, District Environmental Engineer, TNPCB, Dharmapuri and Assistant Environmental Engineer, TNPCB, Dharmapuri.

During the Personal Hearing, copy of Reference No.1 alone was provided to the undersigned but copies of Reference No. 9, 10, 11 and 12 were not provided. However, they assured for giving the copy through therein either under Reference No. 6. It was stated by your officials that certain conditions numbering 5 stipulated in the proceedings No. TNPCB/T2/F.0225102/Directions/Water/2023 dated 16.02.2023 are partially complied. In reply, we have explained the present status of compliance in detail point wise with supporting evidences and all documents relating thereto were submitted during the Personal Hearing.

As per the instructions of the JCEE vide Reference No. 7, the Unit's present status of compliance of the above 5 directions are furnished hereunder together with the supporting documents thereof in the form of the enclosed Annexures

The present status of compliance along with supporting evidences in the sequence listed in your letter dated 23.01.2026 which are one and the same of your Board Memo No. T4/TNPCB/F.015306 /Compliant / 2025 dated: 26.12.2025		
1.	Time-bound action plan for Green Belt Development	The Direction for compliance is that the unit shall furnish time bound action plan to replace the semmaikaruvelam trees within 15 days from the date of show cause notice of TNPCB dated 17.10.2022 and the closure order dated 8.11.2022. Accordingly if the unit had furnished the time bound action plan for replacement of semmaikaruvelam trees, it is construed that the direction is complied. The unit has already submitted the time bound action

		plan in its reply dated 28.10.2022 to the show cause notice dated 17.10.2022 and also requested for Personal Hearing. The Board had not taken into account our reply and request for Personal Hearing. If the Board had gone through this reply, then the Board would have treated that the directions are complied. The TNPCB's status remark to the NGT that the direction is "partially complied" is the remark given without applying mind on the time bound action submitted by the unit. In keeping with the said action plan submitted for removal of trees in a phased manner, 80% to 85% of the removal of the Seemaikaruvelam trees have been completed as on date as shown below: • Total Green Belt Area: **38 acres** • Removal completed as of 08.06.2025: **25 acres** • Removal Completed from 08.06.2025 to 14.12.2025: **8 acres** **Accordingly 33 acres completed.** • Balance to be completed within six months: **5 acres** **Annexure No. 1** The on-going removal of the Seemaikaruvelam trees will be completed within one year (2027) as per the above time bound action plan. Thus, the time bound action plan for replacement of trees having been submitted, the direction relating thereto stands complied.
2.	Plan Layout for marking the Green Belt area for utilization of treated effluent with Name, No. of species and Plantation area.	The unit has already submitted the layout of premises marking the green belt area for utilization of treated effluent to DEE, Dharmapuri vide letter VSIPL/PCB/2024-25/37 Dt. 25.04.2024 and by mail Dt. 29.10.2024. The same was also submitted to Hon'ble NGT vide affidavit Dt. 08.06.2025. **Annexure No. 2**

		The plantation details submitted are as follows: • Neem – 5800 • Mahogany –1000 • Naaval – 200 • Pungam – 1300 • Casuarina – 4100 • Seluer Oak - 2800 --- Total - 15200 --- Inspite of the above, the basis on which the Respondent TNPCB in its affidavit Dt. 28.04.2025 filed purposefully in OA 47/2023 instead of Appeal No.77/2022 is not known. It has recorded the status as 'partially complied' without applying mind as stated above. The Layout of the premises marking the green belt area that are being maintained for utilization of treated effluent along with the plantation details such as number of plants, name of the plants species and plantation area, is once again enclosed for favour of ready reference **Annexure No. 1** This having been done, the direction relating thereto stands complied.
3.	Ground Water Quality study	It is respectfully submitted thattheAnna University has already studied the ground water quality and reported in their design adequacy report itself regarding the study of ground water (green belt area)in Sl.Nos. 12 & 13 under table 4 in page No. 30. Based on the instructions of NGT during the last hearing the Appellant Unit has since engaged **Tamilnadu Agriculture University, Coimbatore who is competent to conduct agricultural related studies (since some complaints are from farmers)**

		and got conducted a comprehensive groundwater quality study at Green Belt Area. The report of the study given by TNAU has been duly submitted and the hard copy of the report is enclosed **Their conclusion in the report**: A total of 11 samples of groundwater from various Piezometer wells, Open Wells, Bore Well and Pond were collected from the greenbelt area that was maintained utilizing the treated trade effluent of Varalakshmi Starch Industries at Pappireddipatti. The Analytical results of all these samples are enclosed with this report. The physiochemical and organic inference drawn from the analytical results have been given in this report and overall, it can be concluded that there has been no noticeable deterioration in the ground water quality in the study area of the greenbelt due to the discharge of the industry's treated trade effluent. The Design Adequacy Report for existing Effluent Treatment Plant is enclosed. **Annexure No. 3** Accordingly ground water quality study report submitted and hence the direction was duly complied.
4.	Water and Waste Water Audit Report	The TNPCB issued Proceeding No.: TNPCB /T2 / F.025102 /Directions / Water / 2022 dated 17.10.2022 wherein in Point No. 2, directions were issued as below: **"The Unit has to conduct detailed study by a reputed institution by Anna University, Chennai / IIT Chennai on water and waste water audit and adequacy of their existing and proposed effluent treatment plant systems".** **Annexure No. 4**

		Accordingly, the Appellant engaged Anna University, Chennai to conduct the detailed water and waste water audit at their processing areas and adequacy of the existing ETP of the Unit and the Anna University had submitted the Design adequacy report containing 8 chapters as follows,- 1.0 - Introduction 2.0 – Geographical Location of Varalakshmi Starch Industries (P) Ltd. 2.1 – Manufacturing Process at Varalakshmi Starch 2.1.1 – Manufacturing Process at Tapioca Starch 2.1.2 – Manufacturing Process at Tapioca Sago 2.1.3 – Manufacturing Process at Maize Starch 3.0 – Varalakshmi Starch Industries – ETP Scenario 4.0 – Status and observations of Varalakshmi Starch ETP on 24th February 2023 5.0 - Electromagnetic Flow Meter Readings 6.0 - Green Belt Area 7.0 – Safety Measures 8.0 – Summary (Conclusion and Recommendations) It is discussed in Chapters 2.1.1, 2.1.2 and 2.1.3 about the water flow. The adequacy study includes water and waste water audit also in the process area and the waste water flow also monitored and discussed in pages 34 to 43. **It is submitted that despite the above, TNPCB is still harping on the same directions in point No. 2 of proceedings dated 17.10.2022 as it is and directs that "The Unit has to conduct detailed study by a reputed institution by Anna University, Chennai / IIT Chennai on water and waste water audit and adequacy of their existing and proposed effluent treatment plant systems".**

		Accordingly, the direction is perfectly complied to the extent that the Anna University has conducted a study and given the report on water and waste water audit and adequacy of their existing effluent treatment plant systems and Green Belt Area Ground Water Study also dated 29.05.2023. **The May 2023, the original combined Adequacy report issued by Anna University, was submitted to the DEE on June 2023 and also filed with Hon'ble NGT, Chennai on 14.02.2024.** **Annexure No. 5** **Copy enclosed for Design Adequacy Report for Existing Effluent Treatment Plant- report issued by Anna University, Chennai** Accordingly, this condition also remains complied.
5.	Exemption letter for the Bank Guarantee	It is respectfully submitted that the intention behind requiring a Bank guarantee of Rs. 50 Lakhs from the Appellant is to secure compliance of the ETP revamping works so as to satisfy that the treated trade effluent meets the standards prescribed by the Board. Now, in as much as the TNPCB itself have accepted and in their status report against SI.No.1 of TNPCB direction dated 16.02.2023 mentioned that this direction has been complied, the purpose of the **Bank guarantee has been fulfilled and hence the same is not warranted any more**. Hence, the Appellant vide their letter addressed to the Chairman, TNPCB in Letter No. VSIPL/TNPCB/Chairperson/2025-26/218 dated 08.08.2025submitted that all the directions as per closure order dated 8.11.2022 are complied and requested the Chairman, TNPCB for waiver of furnishing bank guarantee of Rs.50 Lakhs. For the

		past 150 days, the Appellant have neither received any demand from the Board nor received any refusal of their request leading to an inference that the Board has agreed to our request for waiver of the bank guarantee **Annexure No. 6** Accordingly the direction is deemed to be accepted and relaxed by TNPCB.

Our industry is a rural agro-based export industry. Our tapioca unit operates seasonally, with the peak crushing season between November and February (four months each year), and it supports more than 10,000 farmers in this backward and agriculture-dependent district. In this situation, our market reputation, supply chain, and customer confidence are developed over the past 20 years, have been severely damaged due to the non holding of valid consent order by us for the current 4 years from TNPCB, causing irreparable loss of money and goodwill in both domestic and international markets. This has resulted in financial losses not only to our company but also to the farmers in and around Dharmapuri District, who are currently selling their tapioca at a loss of Rs. 4,500/- to Rs. 5,000/- per MT against the previously prevailing rate of Rs. 10,000/- to Rs. 11,000/- per MT during the year 2021-22. The rural workforce has also been adversely affected due to loss of employment. In addition, the Government's revenue and foreign exchange earnings through Tapioca Starch export have been substantially reduced due to under-operation of our unit. Only the Hon'ble NGT, Chennai, has come to the rescue of this industry to survive for the past 4 years through the stay order against your closure order. We have already submitted all the documents to prove that all the directions are complied and atleast by now. If the valid consent order is issued, the industry will continue their operation as it existed before 4 years and the livelihood of the farmers will also be assured and the purpose for which the TN Government has initiated this industry will also be continued and accordingly the rural farmers will get the assured market with remunerative price as of the Government's goal.

As mentioned above, all the 7 conditions imposed through the proceedings dated 17.10.2022, 10 findings as per closure order dated 8.11.2022 and 13 directions dated 16.10.2023 issued by Board as directed by NGT after the appeal No. 77/2022 was filed are complied and by way of evidence / proof, we have

enclosed the Annexures 1-7. If the JCEE inspects our plant for verifying the current status of compliances in respect of the above directions, it will be good for our industry.

In view of the above, we request you to kindly submit a report on the present status of compliance to Honorable NGT during the Next Hearing on 22.02.2026 which is a middle of peak tapioca harvesting season for improving the farmers tapioca selling price.

1 - Compliantagainst our industries by P.Suresh–whatever orally informed in the Personal Hearing by the JCEE - regarding:

Our industry has been functioning for the past 25 years from 1997 with no changes in the agro raw materials and the product line with valid TNPCB Consent order upto 2021 and our industry has not disposed of any effluent into nearby water bodies. There are no such complaints against our industry during this period as the past records would vouch.

No complaints are received specifically against our processed waste water of 500 KLD as specified in the consent as it is a by product used as the raw material for producing 30000 cubic meter of bio gas every day which is saving around coal worth of Rs. 1.5 Lakhs per day and accordingly it is not a waste and a valuable by product for our industry, This project initiated by UNDP under demonstration scheme (waste to energy) through Ministry of Non-conventional energy sources, Government of India and the project implemented by Tamilnadu Energy Development Agency, Government of Tamilnadu with Technology provided by American University viz. New Jersy Institute of Technology, New York USA **Annexure No. 7**

The complainant, P. Suresh is not actually a farmer, nor does he engage in cultivation activities. However, while falsely claiming himself as a farmer, he has been making several false allegations against our Industry repeatedly before various government departments over the past four years. These allegations are fabricated and are made without any concrete or substantial evidence either photos or videos to show discharging of the waste water with chemicals into outside by the unit.

This individual, along with a few others, has formed an unlawful farmers' association and, with the sole intention of extorting illegal money for him and others in multi lakhs of Rupees from our factory, has misled innocent poor farmers from the surrounding areas, obtaining their signatures to file numerous complaints against our company with various government departments, including the Chief Minister's Special Cell and the Legislative Assembly Committee from 2022.

(**Annexure No. 8** Video enclosed showing how the complainant, P. Suresh, backed by another person who is law graduate (professional issue organiser) purposely motivating and brain washing the poor and innocent farmers with false and fabricated allegations and portraying the Government officials as corrupt and falsely declaring that a Supreme Court Senior Lawyer will appear for him in this case without any fees and commenting on the Supreme Court Hon'ble justice in very bad abusing word**).**

For the serious complaint dated 05.03.2022 given by the P.Suresh to the District Collector, Legislative Committee, Chief Minister Cell and the TNPCB and many others departments, alleging that untreated wastewater with chemicals were discharged into the public lands, thereby causing fish deaths, animal deaths, and causing allergy, skin diseases, digestive problems, headache, vomiting, loose motion and cancer to the human affecting the public and livestock affecting the (**Annexure No. 9)** Agriculture plants, the District Collector formed a committee comprising 12 departments headed by the DRO, Dharmapuri and the committee conducted a joint inspection in our industry for the whole day on 30.11.2022 and submitted their combined report in Na.Ka.0013/2022/TNPCB dated 23.01.2023 to the District Collector, in which it was clearly confirmed that our industry is not discharging any type of industrial waste water out side and no such allegations related with fisheries, health, animal husbandry, drinking water for the surrounding villages and agriculture departments framed by P. Suresh are true and no such happenings had occurred there in and around the industry and no human being is affected as complained by P,Suresh. Some departments have pointed out some directions for compliances / violations which are not related to the complaint of P.Suresh and our Industry has also responded to

them. Department- wise compliances were submitted to the District Collector. **Annexure 10.** Since there was no further action from the District Collector, the request was deemed to be accepted.

In this situation, the complainant, P. Suresh, after becoming aware that the findings of the various departments are not favourable to him proceeded to file O.A. No. 47/2023 before the Hon'ble NGT, South Zone, Chennai against the Tamil Nadu Pollution Control Board represented by its Chairperson, Chennai (Respondent No. 1); the Executive Engineer, Water Resource Department, PWD, Upper Peenaiyar Division, Dharmapuri (Respondent No. 2); the Executive Engineer, Ground Water Division, Water Resources Department, PWD, Vellore (Respondent No. 3); the Assistant Engineer, Irrigation Department, Vaniyar Dam, PWD, Pappireddipatti, Dharmapuri (Respondent No. 4); The Honourable District Collector, Dharmapuri (Respondent No. 5); and M/s Varalakshmi Starch Industries (P) Ltd., represented by its Managing Director, Mr. V. Anbalagan (Respondent No. 6). The said case is still under trail and has not yet been concluded by the Honourable NGT South Zone at Chennai.

This being the case, how the same complainant, P. Suresh has again filed the same fake and fabricated complaints against of our industry without any basis and charging the Government Departments who are respondents in the O.A. 47/2023 filed by him, despite the fact that the case is still under Trail. In this situation, it is a surprise how TNPCB is entertaining the frequent complaints of P. Suresh who had included TNPCB also as a respondent in OA 47/2023 alleging that TNPCB is not following the act.

Even after filing O.A. No. 47/2023 in the year 2023, the person P. Suresh has given many such false complaints against our industry to the TNPCB. Based on these complaints, the TNPCB Dharmapuri officials have conducted surprise inspections at our factory many times and collected many samples of well water, jungle stream water, bore well water and treated waste water. The samples were tested in TNPCB's own laboratory and the sample test reports (ROA) have indicated

that all the parameters were within TNPCB-prescribed standards. This evidently proves that the complaints made by P. Suresh are all fake and false and illegal and filed with ulterior motive for personal gains and should not be entertained particularly when the matter is subjudice with the Hon'ble NGT.

As a Managing Director of the rural agro based food product manufacturing and exporting large scale industry, for the past 4 years the undersigned is struggling a lot with their 90% total attention is diverted only in saving the industry from the closure order instead of concentrating in their day to day and future business activities and for sustaining this agro based seasonal industry providing rural employment and assured market and remunerative price to rural farmers , export revenue and many statutory revenue generation and farmer friendly industry from the clutches of a greedy unscrupulous person as P.Suresh.

We therefore request your goodselves to understand the situation in its real perspective and kindly do the needful.

Yours sincerely,
For Varalakshmi Starch Industries Pvt. Ltd.,

(V. Anbalagan)
Managing Director

C.C.:

1. The JCEE (M), TNPCB, Salem

Enclosed on:

Annexure No. 1 : Updated time-bound action plan for Green Belt Development and Plan Layout for marking the Green Belt area for utilization of treated effluent with Name, No. of species and Plantation area.

Annexure No. 2 : DEE, Dharmapuri vide our letter VSIPL/PCB/2024-25/37 Dt. 25.04.2024 and by mail Dt. 29.10.2024. The same was also submitted to Hon'ble NGT vide affidavit Dt. 08.06.2025.

Annexure No. 3 : Ground Water Quality Study Report at Green Belt Area issued by Tamilnadu Agriculture University, Coimbatore

Annexure No.4 : TNPCB Board Proceeding No.: TNPCB /T2/F.025102 /Direction / Water /2022. Dt: 17.10.2022.

Annexure No. 5 : The copy of Design Adequacy Report for Existing Effluent Treatment Plant – report issued by Anna University, Chennai.

Annexure No. 6 : Exemption letter for the Bank Guarantee(Request letter No. VSIPL/TNPCB/Chair Person /202526/218 Dated 08.08.2025 to The Chairperson TNPCB, Chennai – Request to withdraw the Direction of providing Bank Guarantee of Rs.50 lakh)

Annexure No. 7 : Copy of NJIT –Biomethanation Project and Tamilnadu Energy Development Agency Approved copy – 2 Letters and 2 Photos of Hybrid Reactor.

Annexure No. 8 : The complainant, P. Suresh and with law qualified person ill motive canvass the poor farmers the video enclosed.

Annexure No. 9 : The complainant, P. Suresh letter dated 05.03.2022.

Annexure No. 10 : Combined report submitted by 12 departments headed by the DRO, Dharmapuri, to the Honourable District Collector.

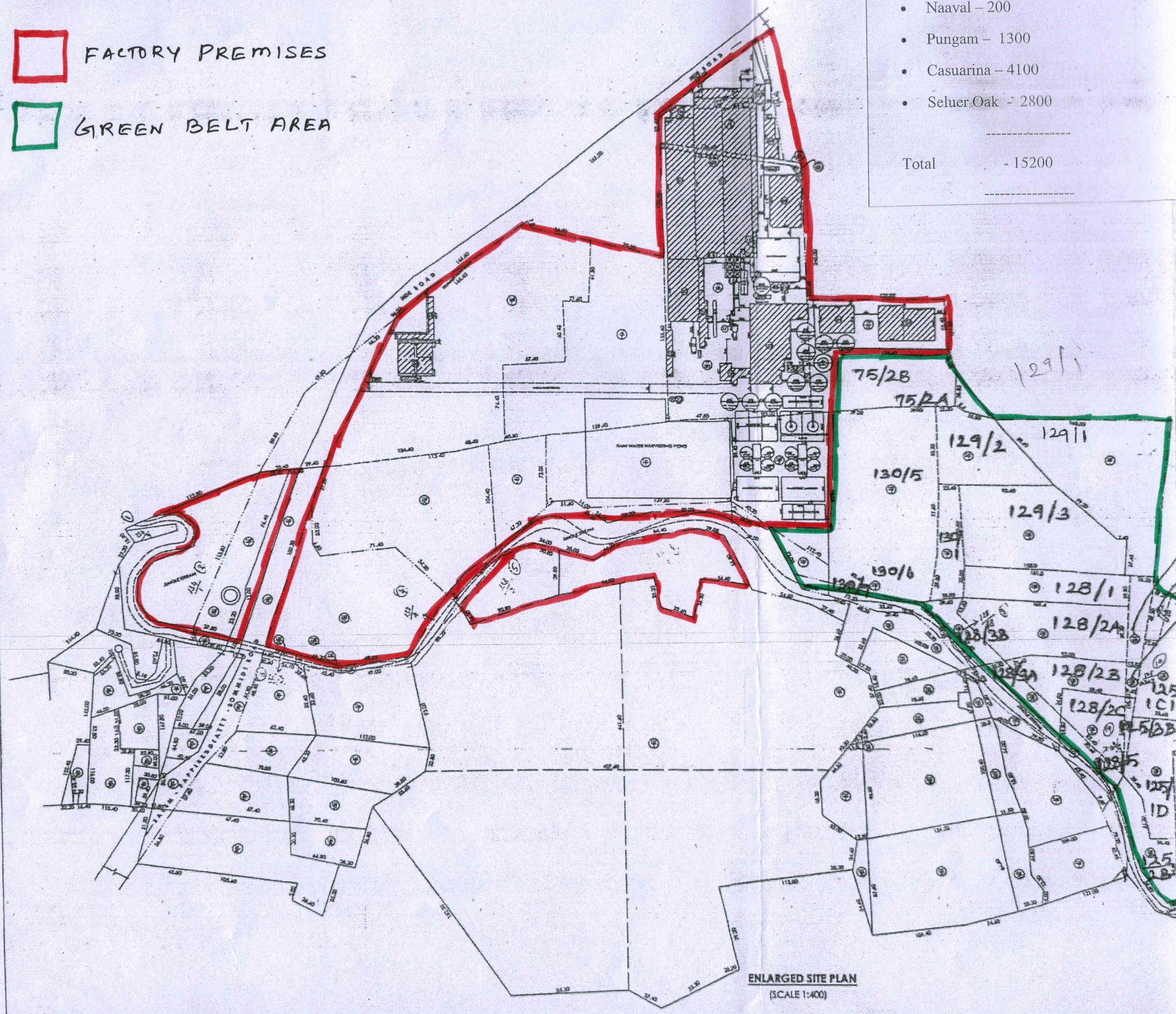
Annexure No.1

VARALAKSHMI STARCH INDUSTRIES (P) LTD.,
PAPPIREDDIPATTY TALUK,
PAPPIREDDIPATTY VILLAGE & ALAMELUPURAM VILLAGE,
DHARMAPURI DISTRICT.

ORIENTATION
WEST
SOUTH — NORTH
EAST

FACTORY PREMISES

GREEN BELT AREA



ENLARGED SITE PLAN
(SCALE 1:400)

The plantation details submitted are as follows:

- Neem – 5800
- Mahogany –1000
- Naaval – 200
- Pungam – 1300
- Casuarina – 4100
- Seluer Oak - 2800

Total - 15200

Land for Greenbelt for disposing treated wastewater			
Village Name	Patta No.	Survey No.	Extent in Hectares
Pappiredipatty	206	75/2	0.95.00
Alamelupuram	18	125/1D	0.49.50
	18	125/2B	0.33.50
	18	125/3B	0.03.50
	18	128/2C	0.30.50
	18	128/5	0.14.50
	25	121/2A	1.26.50
	25	121/2B	0.76.00
	25	125/1A	2.44.00
	25	125/1C1	0.55.00
	25	125/1C2	0.07.00
	25	125/2A	0.16.50
	25	125/3A1	0.19.00
	25	125/3A2	0.04.00
	25	128/2A	0.84.00
	25	128/2B	0.36.00
	25	128/3A	0.13.50
	25	128/3B	0.14.00
	25	130/7	0.16.00
	37	128/1	0.50.00
	37	129/1	1.47.50
	37	129/2	0.68.50
	37	129/3	1.15.50
	37	130/1	0.32.00
	37	130/5	1.51.00
	37	130/6	0.11.50
Total			15.140

Annexure No 2 36

VARALAKSHMI STARCH INDUSTRIES (P) LTD.

MRFS. & EXPORTERS : SUPER HIGH GRADE TAPIOCA SAGO, TAPIOCA STARCH, MAIZE STARCH, MODIFIED STARCHES & SAGO PAPADS

VSIPL/PCB/2024-25/37 25.04.2024

To

The Chairman,
Tamil Nadu Pollution Control Board,
Chennai

Madam,

Sub: Re-submission of our Online Consent to Operate (CTO) Renewal Application No.53943486 for Water & Air Consent Reg.

Ref:
1. Our Online Application for Renewal of Consent orders submitted on 20/04/2021 with a payment of Rs.4,54,756/- by SBI DD Bearing No. 765824 dated 17/04/2021-got auto deleted due to TAT days during covid.
2. Our Online Application for Renewal of Consent Orders submitted on 09/10/2021.
3. Return of our Application with Scrutiny Report dated 18/10/2021.
4. Our letter No.VSIPL/PCB/2021-22/337 dated 08/11/2021with Photos of our ETP
5. Resubmission of our Online Application for Renewal of Consent Orders on 16/11/2021.
6. Return of our Application with Scrutiny Report dated 17/11/2021 citing to The DEE letter F.DMP.0013/DEE/TNPCB/DMP/OL/2021 dated 17/11/2021.
7. Resubmission of our Online Application for Renewal of Consent Orders on 18/11/2021.
8. Our letter No. VSIPL/PCB/2021-22/366 dated 20/11/2021 addressed to The Chairman PCB with a CC marked to the Member Secretary and The DEE & Resubmission.
9. Return of our Application with Scrutiny Report dated 17/12/2021 citing The DEE letter F.DMP.0013/DEE/TNPCB/DMP/OL/2021 dated 16/12/2021.
10. Resubmission of our Online Application for Renewal of Consent Orders on 29/01/2022 for keeping the application active in portal.
11. Return of our Application with Scrutiny details received through OCMMS portal on 04/02/2022
12. Our Submissions to DEE vide letter No. VSIPL/PCB/2021-22/525 dated 24/02/2022.
13. Resubmission of our Online Application for Renewal of Consent Orders on 19/03/2022.
14. Return of our Application with Scrutiny details dated 28/03/2022.
15. TNPCB Board's Proceeding No. TNPCB/T2/F.025102/DMP/OL/Directions/W/2021/dated 18/04/2022 received on 25/04/2022.
16. Our letter No. VSIPL/PCB/2022-23/037 dated 02/05/2022 addressed to The Chairman, PCB with a CC marked to the DEE.
17. Our Online Application -fresh submission for Hazardous Waste Management submitted on 11/05/2022, second time.
18. Our 2nd letter No. VSIPL/PCB/2022-23/060 dated 11/05/2022 addressed to The Chairman, PCB, in continuation to our letter dated 02/05/2022 with a CC marked to the DEE.
19. Our Online Resubmission of Application for Renewal of Consent Orders on 02/05/2022.
20. Return of our Hazardous Waste Management Application with details dated 21/05/2022.
21. Return of our Renewal Application with Scrutiny details dated 23/05/2022.

Regd. Office : " Varalakshmi Tower ", II Floor, No. 127/1, Gandhi Road, Salem - 636 007. T.N. India.
Email : office@varalakshmistarch.com | Mobile : 94426 13174, 94421 33794
Factory : No. 7/114-126, Bommidi Main Road, Pappireddipatti (Po), Dharmapuri Dt. - 636 905.
GSTIN : 33AABCV0094P1Z2 | CIN No. U01532TZ1995PTC006136
www.varalakshmistarch.com

IS : 899 CM/L-6100012769 TAPIOCA SAGO

IS : 1319 CM/L-6299891 TAPIOCA STARCH

22. Inspection of our unit by the The JCEE (M), The DEE and The AEE on 04/08/2022.
23. Letter from The JCEE (M) on 18/08/2022 vide Lr.No.JCEE(M) VLR-Z/TNPCB/DMP/15/10/2022 Dt.16/08/2022
24. Resubmission of Application for Renewal of Consent Orders on 19/08/2022 –To keep active.
25. Meeting with JCEE (M) on 22/08/2022 followed by our letter No. VSIPL/PCB/2022-23/242 dated 25/08/2022.
26. Return of our Renewal Application with Scrutiny details dated 23/08/2022.
27. TNPCB Board's Proceeding No. TNPCB/T2/F.025102/ Directions/Water/2022/dated 17/10/2022 received on 25/10/2022 by Speed Post.
28. Our letter No. VSIPL/PCB/2022-23/335 dated 19/10/2022 addressed to The Chairman PCB, seeking copies of the letters referred in 2, 3 & 4 of the Proceedings cited in reference 28, with a CC marked to the JCEE& DEE.
29. The DEE letter F.DMP.0013/DEE/TNPCB/DMP/OL/2021 dated 22/10/2022 stating the copies sought for - are internal correspondences
30. Our Letter No. VSIPL/PCB/2022-23/343/RPAD dt 28.10.2022 – addressed to The Chairman for the Proceedings dated 17.10.2022 – reg. the renewal of Consent order to our industry.
31. TNPCB proceedings No.TNPCB/T2/F.25102/DMP/Closure/Water/2022 dt 08.11.2022 received by us as soft copy on request by e-mail from DEE, TNPCB on 10.11.2022 and original copy received through Speed post on 15.11.2022.
32. Our Letter No.VSIPL/PCB/2022-23/379 dt 21.11.2022 – our submission towards revocation of closure order and disconnection of power supply.
33. Our letter No. VSIPL/PCB/H.D/COLLECTOR/2022-23/378 dt 21.11.2022 – Sudden disconnection of power supply to our Agro based industry by TNPCB on 08.11.2022.
34. NGT Interim order dated 09.12.2022, there will be an order of Interim Stay of the Impugned Order dated 08.11.2022 and the 4th Respondent is directed to restore the power supply immediately.
35. Our letter No. VSIPL/PCB/2022-23/402/RPAD dt 15.12.2022 to The Chairman, TNPCB regarding renewal of Consent.
36. TNPCB Proceedings No. TNPCB/T2/F.025102/Directions/Water/2023, dt 16.02.2023.
37. Resubmission of Online renewal application Letter No. VSIPL/PCB/2022-23/DT 01.03.2023
38. Our reply No. VSIPL/PCB/2022-23/498/RPAD dt 02.03.2023 for the Proceedings from TNPCB dt 16.02.2023.
39. Our letter No.VSIPL/PCB/2022-23/513/RPAD dt 14.03.2023 Reg. Consent Renewal Constraints being faced due to consent order validity got over.
40. Our letter No. VSIPL/PCB/2022-23/38 DT 06.06.2023 reg - our renewal application deleted and consent fee forfeited on 05.06.2023.
41. Our letter No. VSIPL/PCB/2023-24/RPAD/74 dt 05.07.203 – Restoration of our online renewal application.
42. Our Online renewal CTO application submitted in the OCMMS portal on 11.07.2023.
43. Online renewal application returned by TNPCB on 21.07.2023.
44. Our Letter No.VSIPL/PCB/2023-24/94 DT 28.07.2023 – Resubmission of online application.
45. Online renewal application returned by TNPCB on 03.10.2023.
46. Our Reply for the second online return to your scrutiny compliances dt 21.07.2023 and 03.10.2023 - Letter No. VSIPL/PCB/2023-24/266 dt 29.12.2023.
47. Our Letter No. VSIPL/PCB/2023-24/272 dt 01.01.2024 for the online resubmission of Consent Renewal Application.
48. Online renewal application returned by TNPCB on 29.01.2024.

Our industry is a Rural Agro Based Medium Scale Export Oriented Industry located in the Backward District of Dharmapuri, manufacturing Tapioca Starch, Sago, Pappad, Maize Starch and Modified starches out of Tapioca Tubers and Maize Kernels operating for the past 25 years with valid Consent orders from TNPCB. We are the only exporter of Tapioca starch from India and providing Foreign Exchange to our Country.

We had submitted our online renewal application well within the time for the renewal of our consent, but the DEE of the Dharmapuri TNPCB office have been returning our online application several times by citing several similar compliance directions and also artificially added additional compliance directions whenever our online application was being returned and moreover these directions are only related to minor improvements but are being cited for withholding the renewal.

While our renewal applications are being withheld, we have received information through RTI that other similar large starch and sago industries located in Namakkal and Erode Districts are being given consents for further expansion of their industries without any impediment. For these other industries, the District Environmental Engineers of Namakkal and Erode Districts never sought such stringent compliances for providing consent for expansion or consent renewal and NOC from PWD for drawal of groundwater for industrial use was also not insisted though such industry was located in an Over-Exploited Area. But for us, the Dharmapuri DEE was insisting on NOC from PWD though our industry is located in a Semi-Critical area even though we have not applied the consent for expansion. Similarly, the DEE's of Namakkal and Erode also never insisted for Water & Wastewater Audit, Groundwater quality Audit, Stability study, Adequacy report of the ETP by reputed institutions like Anna University or IIT Madras, but the DEE of Dharmapuri had been insisting us to obtain such audits and studies. This has led to these other similar industries using the same raw materials and manufacturing the same finished products as us getting big business and earning huge profits. Due the delay in consent renewal to us, we have lost huge business and lost our market share in the sago and starch market and lost our international buyers for the last 3 years. Our industrial income has reduced drastically but expenditure has increasing alarmingly in the past 3 years mainly due to non-renewal of our consent. The principle of natural justice requires that all including industries are treated equally in India but the Dharmapuri TNPCB officials are insisting on various compliances from us and are continuously on monthly basis collecting the treated wastewater and groundwater samples and testing the same at their own laboratory and confirms in the test reports that our parameters are well within the standards prescribed by the TNPCB, but the same compliances and monitoring are not followed in other similar competing industries in neighbouring districts. We cannot understand what the strategy is behind this. We want Justice then only we can survive in this field.

At present our industry is functioning with the Interim stay order issued by The Hon'ble National Green Tribunal, Southern Zone, Chennai on our appeal against TNPCB closure order dated 08.11.2022. In the interim order, Hon'ble Judicial Member Smt. Pushpa Sathyanarayana and Hon'ble Expert Member Dr.Satyagopal Korlapati clearly narrated that "whatever has been pointed out in the Impugned order are rectifiable and does not warrant the closure of the unit". Accordingly, the Hon'ble NGT also confirmed that the directions for compliance issued by TNPCB are merely only improvement compliances and it is not a serious issue for closure of the industry and denying the consent renewal.

With the instructions from the TNPCB, we had approached the Centre for Environmental Studies Department, Anna University to conduct a detailed study of our ETP. And they provided a detailed Adequacy report of our ETP on 29.05.2023. Later the CES Department of Anna University had cancelled the Adequacy report on 08.07.2023 stating that scientific interpretations with regard to the TDS removal happening in the ETP has to be studied based on the discussions with TNPCB. Following this we had provided information including from our ETP consultant to the Centre for Environmental Studies, Anna University regarding scientific Interpretation on removal of TDS and also submitted the Coimbatore Agricultural University field study report about the TDS in the Sago and Starch industries in Salem and Namakkal Districts. The Centre for Environmental Studies, Anna University on receiving sufficient clarifications approved their Design Adequacy Report dated 29.05.2023 of our ETP vide their email dated 21.03.2024 and the same email was also marked to you by CES Anna University. The CES Department of Anna University confirmed that functioning of our ETP is well within parameters prescribed by the TNPCB Consent orders.

Because of the delay in renewal of consent orders by the TNPCB, we are unable to retain our international buyers as well as big domestic buyers. So we have lost the entire export business which was developed by us for the past 20 years resulting in multi crore loses to our industry for the past 3 years. At present our industry is kept alive due to the Interim stay order against your closure order issued by The Hon'ble NGT, Southern Zone, Chennai against TNPCB closure order dated 08.11.2022.

We have enclosed the reply to your scrutiny report dated 29.01.2024. We have submitted the reply for the all the previous compliances then and there related with renewal of consents. We would like to inform you that there are no changes in the products manufactured and its production capacity or raw materials and there is no change in the quantity of raw water consumption or trade effluent generation.

Varalakshmi Starch Industries (p) Ltd.

Our industry is a Rural Agro Based Export Oriented Industry located in the Backward district of Dharmapuri. More than 10000 Rural, Small, Tiny and Tribal farmers who were cultivating Tapioca and Maize are benefitted from our industry and more than 400 Rural work force are dependent on our Factory for their livelihood. Hence, kindly peruse and consider our renewal application and issue the renewal consent order for Water and Air as early as possible as per the application applied from 01.04.2023 to 31.03.2029 and consent fees of Rs. 13,84,440/- upto 31.03.2029 was also paid. We will always obey the rules and regulations insisted by the TNPCB. Our bankers are insisting to submit the valid consent order from TNPCB, otherwise the financial assistance will be stopped by the bankers. So, kindly provide us the renewal of consent orders to operate our industry smoothly and do the needful.

Thanking you,

Yours faithfully,

For Varalakshmi Starch Industries Private Limited,

V. Ambalagan

Managing Director.

CC to: 1) The Member Secretary, Tamil Nadu Pollution Control Board, Chennai.

2) The District Environmental Engineer, Tamil Nadu Pollution Control Board, Dharmapuri.

Encl: 1. Our reply for Scrutiny Report dated 29.01.2024.

2. EMFM Reading Reports from January 2024 to March 2024.

3. Monitoring wells location map.

TNPCB CONSENT RENEWAL APPLICATION RETURNED IN OCMMS PORTAL on 29.01.2024 with 11 - compliance and our reply

S. No	Scrutiny Description	Our Reply
1	The unit has been already requested to correct the application and furnish the all documents/particulars requested vide note history dated 21.07.2023 and 03.10.2023. But the unit has not furnished/corrected the details called for and the application submitted is incomplete.	Our Consent renewal application (without any modification) for renewal of our Consent order No.2005130094389 and No.2005230094389 dated 02.03.2020 with all necessary supportive documents and status of compliances were submitted earlier and in our submissions through OCMMS portal dated 01.08.2023 and 29.12.2023.
2	The unit shall add all the raw material used to manufacture each product in the application as per the Anna University report 2009, since the unit has informed that that there is no change in raw material and product detail after expansion of the unit.	There are no expansion or additions in our raw material after Year 2009. We had applied only for the renewal of our Consent order No.2005130094389 and No.2005230094389 dated 02.03.2020 without any changes in product or raw materials.
3	The unit uses sulphur/SMBS in the sulphitation plant to steep the maize before getting the maize starch and other by products and hence the unit shall add the details of sulphur/SMBS usage in the application	The Sulphitation plant has already been included during the construction of Maize plant in the year 2009 itself and is available in the Consent order No.2005130094389 and No.2005230094389 dated 02.03.2020. There is no other addition in this plant.
4	The unit shall enter the manufacturing process of modified starch along with raw material used since the unit has informed that only dry process is being followed to manufacture modified starches.	The production of modified starch is already there in our Consent order No.2005130094389 and No.2005230094389 dated 02.03.2020 for which only renewal is being sought now without any new modified starch production. This is for your kind information.

5	The unit has provided Membrane Bio-reactor, Filter Press as a component of ETP. Hence, the unit shall include the MBR and other component details installed for the treatment of effluent in the application.	The MBR Plant is not in the ETP. This plant is an experimental plant for re-use of wastewater in our industry. Because of this reason we have not included MBR in the ETP. Our treated wastewater samples from ETP are collected monthly by TNPCB officials and tested at their own laboratory and the results confirms that our treated wastewater is within the standards for own land irrigation prescribed by the TNPCB.
6	The unit shall include the additional stacks in the maize plant from gluten dryer, flash drier, etc noticed in the emission sources details and its APC measures in the application.	There are no additional Stacks with emission sources in the Maize plant.
7	The unit has not yet to furnished the report of water and wastewater audit study as per the Bd's direction issued vide Proc. dated 16.02.2023.	As per Board's proceedings dated 16.02.2023 we have approached The Centre for Environmental Studies, Anna University to conduct water and wastewater audit study and we had paid the fees requested by them. The Anna University wants access to our entire production plant apart from the ETP and wants to inspect stage wise our production plant which requires us to allow then access to our production machinaries and production technology and knowhow. Since we fear that allowing third party access to our production unit will compromise our technology knowhow, the audit is held up.
8	The unit has not yet to furnished the report of ground water quality study in the green belt area that are being maintained utilizing the treated effluent as per the Bd's direction issued vide Proc. dated 16.02.2023.	The TNPCB officials for the last two years have taken so many samples of groundwater in our own greenbelt area, Farmers wells and Public wells in the surrounding one kilometer radius. They tested the water samples in their own laboratory and reveals that the parameters of the ground water were well within standards prescribed by the TNPCB.
9	The unit has not yet to furnished the monthly report of EMFMs reading provided at the inlet and out let of ETP as per the Bd's direction dated 16.02.2023. Hence, the same shall be uploaded.	Upto December 2023 we had submitted the EMFM reading on 01.01.2024. Herewith we have enclosed the monthly report of EMFMs reading at the inlet and outlet of the ETP from Jan 2024 to March 2024.

10	The unit in its compliance status of Bd's direction dated 16.02.2023 in S.no.7 it was informed that "have already provided piezometric (monitoring well) in the greenbelt area". However, the unit has not enclosed any document showing the location of the same the same. Hence, the unit shall furnish the detail of piezometric well provided	We had provided the piezometric (monitoring well) wells in the green belt area. The location map is enclosed for your reference.
11	The unit shall furnish the present status of compliance for the violations noticed in closure order dated 08.11.2022. Further, the cases filed before the Hon'ble NGT (SZ) vide Appeal No.77/2022 (against the closure order of the Board by the unit) and vide O.A.47/2023 (Against the operation of the unit by the Complainant Thiru Suresh) were pending. Also, Still Complaints have been received against the operation of the unit in every Farmers Grievances day meeting. Hence the application is returned for correction in the application , want of additional particulars and compliance of the Board's directions	The compliances referred in the closure order dt 08.11.2022 are mainly for the development/improvement of the industry and not related to the closure of the industry. This was clearly confirmed in the Interim stay order dated 09.12.2022 issued by the Hon'ble NGT that "whatever has been pointed out in the impugned order are rectifiable and does not warrant the closure of the unit". So there is no violation on our part. The hearing on our appeal No. 77 of 2022 at NGT is scheduled on 31.05.2024. With regard to the said farmers complaints mentioned in your scrutiny report, we had already sent a letter to you on 22.04.2024 for obtaining details. Please provide the details of the said farmers complaints against our unit said to have been raised in the recent farmers grievance day meetings so that we can fine tune our ETP if required. We had replied on all the compliances and submitted the relevant supportive documents for your reference. Kindly process our OCMMS online application and provide the Consent order renewal to run our industry smoothly because for the benefit of more than 10000 small, rural, tiny and tribal tapioca and maize growing farmers and village work force who are depend for their livelihood on our industry in the Backward Dharmapuri District.

Varalakshmi Starch Industries Private Limited

EMFM Inlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.01.2024	0	215	215
02.01.2024	215	335	550
03.01.2024	550	210	760
04.01.2024	760	164	924
05.01.2024	924	412	1336
06.01.2024	1336	358	1694
07.01.2024	1694	252	1946
08.01.2024	1946	175	2121
09.01.2024	2121	215	2336
10.01.2024	2336	185	2521
11.01.2024	2521	379	2900
12.01.2024	2900	316	3216
13.01.2024	3216	424	3640
14.01.2024	3640	259	3899
15.01.2024	3899	222	4121
16.01.2024	4121		4121
17.01.2024	4121		4121
18.01.2024	4121	6	4127
19.01.2024	4127	190	4317
20.01.2024	4317	86	4403
21.01.2024	4403	168	4571
22.01.2024	4571	250	4821
23.01.2024	4821	269	5090
24.01.2024	5090	355	5445
25.01.2024	5445	362	5807
26.01.2024	5807	292	6099
27.01.2024	6099	380	6479
28.01.2024	6479	350	6829
29.01.2024	6829	334	7163
30.01.2024	7163	245	7408
31.01.2024	7408	381	7789

For Varalakshmi Starch Industries (P) Ltd.

(V. ANBALAGAN)
Managing Director

Varalakshmi Starch Industries Private Limited
EMFM Inlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.02.2024	7789	360	8149
02.02.2024	8149	360	8509
03.02.2024	8509	420	8929
04.02.2024	8929	403	9332
05.02.2024	9332	410	9742
06.02.2024	9742	377	10119
07.02.2024	10119	154	10273
08.02.2024	10273	377	10650
09.02.2024	10650	382	11032
10.02.2024	11032	350	11382
11.02.2024	11382	357	11739
12.02.2024	11739	282	12021
13.02.2024	12021	300	12321
14.02.2024	12321	331	12652
15.02.2024	12652	229	12881
16.02.2024	12881	295	13176
17.02.2024	13176	251	13427
18.02.2024	13427	284	13711
19.02.2024	13711	240	13951
20.02.2024	13951	300	14251
21.02.2024	14251	198	14449
22.02.2024	14449	199	14648
23.02.2024	14648	267	14915
24.02.2024	14915	310	15225
25.02.2024	15225	300	15525
26.02.2024	15525	230	15755
27.02.2024	15755	210	15965
28.02.2024	15965	250	16215
29.02.2024	16215	241	16456

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

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Varalakshmi Starch Industries Private Limited

EMFM Inlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.03.2024	16456	360	16816
02.03.2024	16816	309	17125
03.03.2024	17125	271	17396
04.03.2024	17396	124	17520
05.03.2024	17520	246	17766
06.03.2024	17766	260	18026
07.03.2024	18026	109	18135
08.03.2024	18135	120	18255
09.03.2024	18255	186	18441
10.03.2024	18441	121	18562
11.03.2024	18562	102	18664
12.03.2024	18664	215	18879
13.03.2024	18879	235	19114
14.03.2024	19114	205	19319
15.03.2024	19319	139	19458
16.03.2024	19458	202	19660
17.03.2024	19660	141	19801
18.03.2024	19801	210	20011
19.03.2024	20011	0	20011
20.03.2024	20011	180	20191
21.03.2024	20191	0	20191
22.03.2024	20191	120	20311
23.03.2024	20311	69	20380
24.03.2024	20380	100	20480
25.03.2024	20480	100	20580
26.03.2024	20580	0	20580
27.03.2024	20580	180	20760
28.03.2024	20760	220	20980
29.03.2024	20980	181	21161
30.03.2024	21161	20	21181
31.03.2024	21181	-	21181

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

Varalakshmi Starch Industries Private Limited
EMFM Outlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.01.2024	0	198	198
02.01.2024	198	221	419
03.01.2024	419	288	707
04.01.2024	707	163	870
05.01.2024	870	303	1173
06.01.2024	1173	374	1547
07.01.2024	1547	195	1742
08.01.2024	1742	395	2137
09.01.2024	2137	199	2336
10.01.2024	2336	178	2514
11.01.2024	2514	353	2867
12.01.2024	2867	279	3146
13.01.2024	3146	461	3607
14.01.2024	3607	240	3847
15.01.2024	3847	206	4053
16.01.2024	4053		4053
17.01.2024	4053		4053
18.01.2024	4053	47	4100
19.01.2024	4100	217	4317
20.01.2024	4317		4317
21.01.2024	4317	259	4576
22.01.2024	4576	231	4807
23.01.2024	4807	290	5097
24.01.2024	5097	290	5387
25.01.2024	5387	330	5717
26.01.2024	5717	430	6147
27.01.2024	6147	330	6477
28.01.2024	6477	351	6828
29.01.2024	6828	350	7178
30.01.2024	7178	338	7516
31.01.2024	7516	118	7634

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

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Varalakshmi Starch Industries Private Limited
EMFM Outlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.02.2024	7634	486	8120
02.02.2024	8120	389	8509
03.02.2024	8509	418	8927
04.02.2024	8927	262	9189
05.02.2024	9189	425	9614
06.02.2024	9614	344	9958
07.02.2024	9958	241	10199
08.02.2024	10199	393	10592
09.02.2024	10592	366	10958
10.02.2024	10958	235	11193
11.02.2024	11193	417	11610
12.02.2024	11610	280	11890
13.02.2024	11890	426	12316
14.02.2024	12316	260	12576
15.02.2024	12576	300	12876
16.02.2024	12876	267	13143
17.02.2024	13143	293	13436
18.02.2024	13436	270	13706
19.02.2024	13706	240	13946
20.02.2024	13946	300	14246
21.02.2024	14246	150	14396
22.02.2024	14396	230	14626
23.02.2024	14626	226	14852
24.02.2024	14852	344	15196
25.02.2024	15196	231	15427
26.02.2024	15427	250	15677
27.02.2024	15677	211	15888
28.02.2024	15888	276	16164
29.02.2024	16164	211	16375

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

Varalakshmi Starch Industries Private Limited
EMFM Outlet Readings Details

Date	Opening reading (m3)	Today reading (m3)	Total (m3)
01.03.2024	16375	383	16758
02.03.2024	16758	287	17045
03.03.2024	17045	268	17313
04.03.2024	17313	142	17455
05.03.2024	17455	262	17717
06.03.2024	17717	173	17890
07.03.2024	17890	206	18096
08.03.2024	18096	86	18182
09.03.2024	18182	200	18382
10.03.2024	18382	80	18462
11.03.2024	18462	140	18602
12.03.2024	18602	136	18738
13.03.2024	18738	200	18938
14.03.2024	18938	178	19116
15.03.2024	19116	150	19266
16.03.2024	19266	193	19459
17.03.2024	19459	47	19506
18.03.2024	19506	172	19678
19.03.2024	19678	163	19841
20.03.2024	19841	39	19880
21.03.2024	19880	143	20023
22.03.2024	20023	238	20261
23.03.2024	20261	61	20322
24.03.2024	20322	115	20437
25.03.2024	20437	90	20527
26.03.2024	20527	0	20527
27.03.2024	20527	180	20707
28.03.2024	20707	220	20927
29.03.2024	20927	35	20962
30.03.2024	20962	169	21131
31.03.2024	21131	-	21131

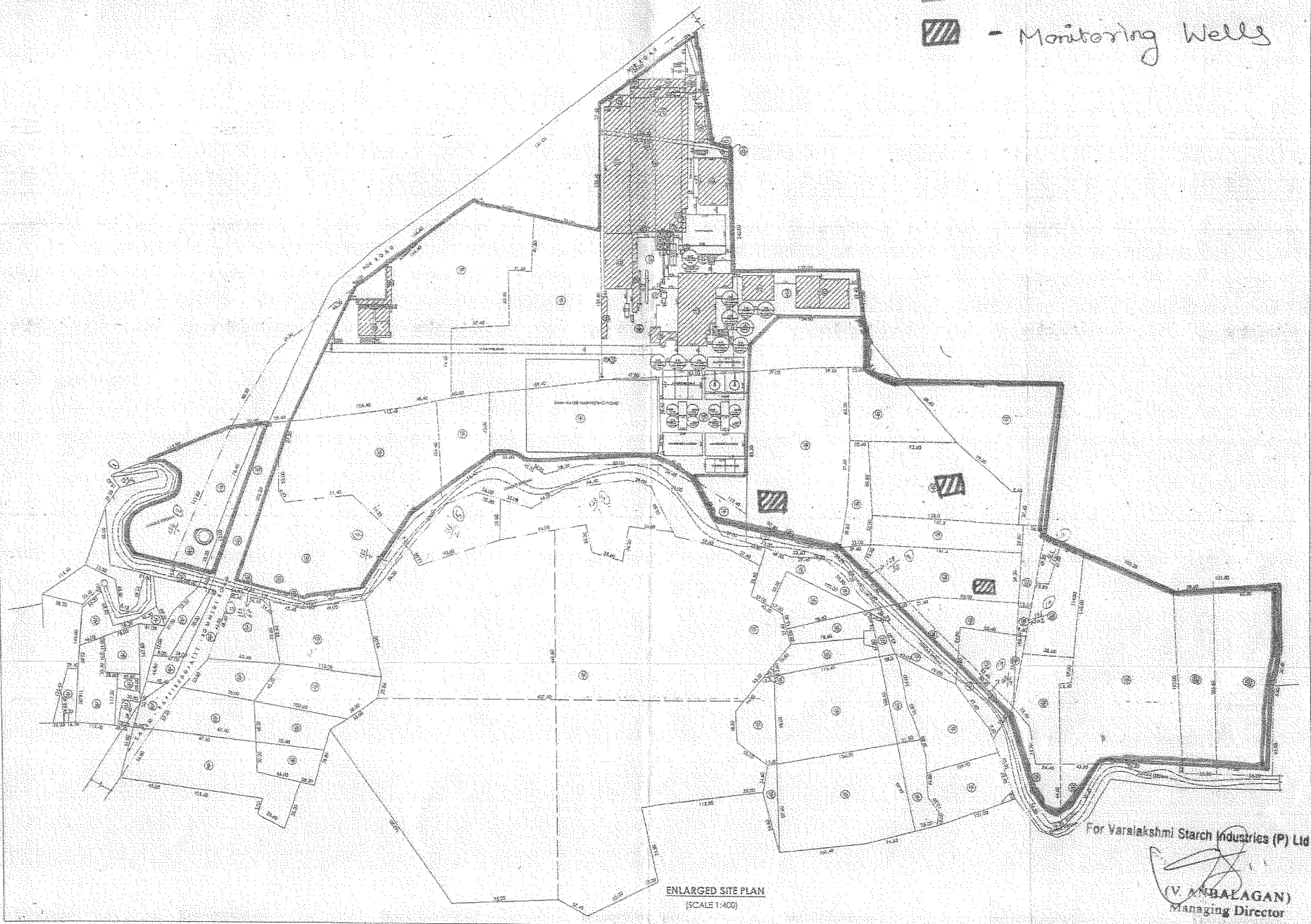
For Varalakshmi Starch Industries (P) Ltd

(V.ANBALAGAN)
Managing Director

VARALAKSHMI STARCH INDUSTRIES (P) LTD.,
PAPPIREDDIPATTY TALUK,
PAPPIREDDIPATTY VILLAGE & ALAMELUPURAM VILLAGE,
DHARMAPURI DISTRICT.

ORIENTATION
WEST
SOUTH — NORTH
EAST

Factory layout
- Green Belt Area
- Monitoring Wells



ENLARGED SITE PLAN
(SCALE 1:400)

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

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Office @ Varalakshmi Starch <office@varalakshmistarch.com>

Green Belt Area

1 message

Office @ Varalakshmi Starch <office@varalakshmistarch.com> Tue, Oct 29, 2024 at 4:45 PM
To: DEE DMP TNPCB <deedmp@tnpcb.gov.in>
Cc: "JMD @ Varalakshmi Starch" <JMD@varalakshmistarch.com>, vsilmd <vsilmd@gmail.com>

To,
The DEE,
TNPCB,
Dharmapuri.

Dear madam,

Please find the attached document for Seemaikaruvelam Trees removed and native trees replanted in our green belt area, this is for your kind information.

Thanking you

For Varalakshmi Starch Industries Pvt. Ltd

Varalakshmi Tower, 2nd floor, 127/1 Gandhi Road Salem 636007, Tamilnadu, India

Green Belt Area.pdf
1650K

VARALAKSHMI STARCH INDUSTRIES (P) LTD.,
PAPPIREDDIPATTY TALUK.
PAPPIREDDIPATTY VILLAGE & ALAMELUPURAM VILLAGE,
DHARMAPURI DISTRICT.

ORIENTATION
WEST
SOUTH — NORTH
EAST

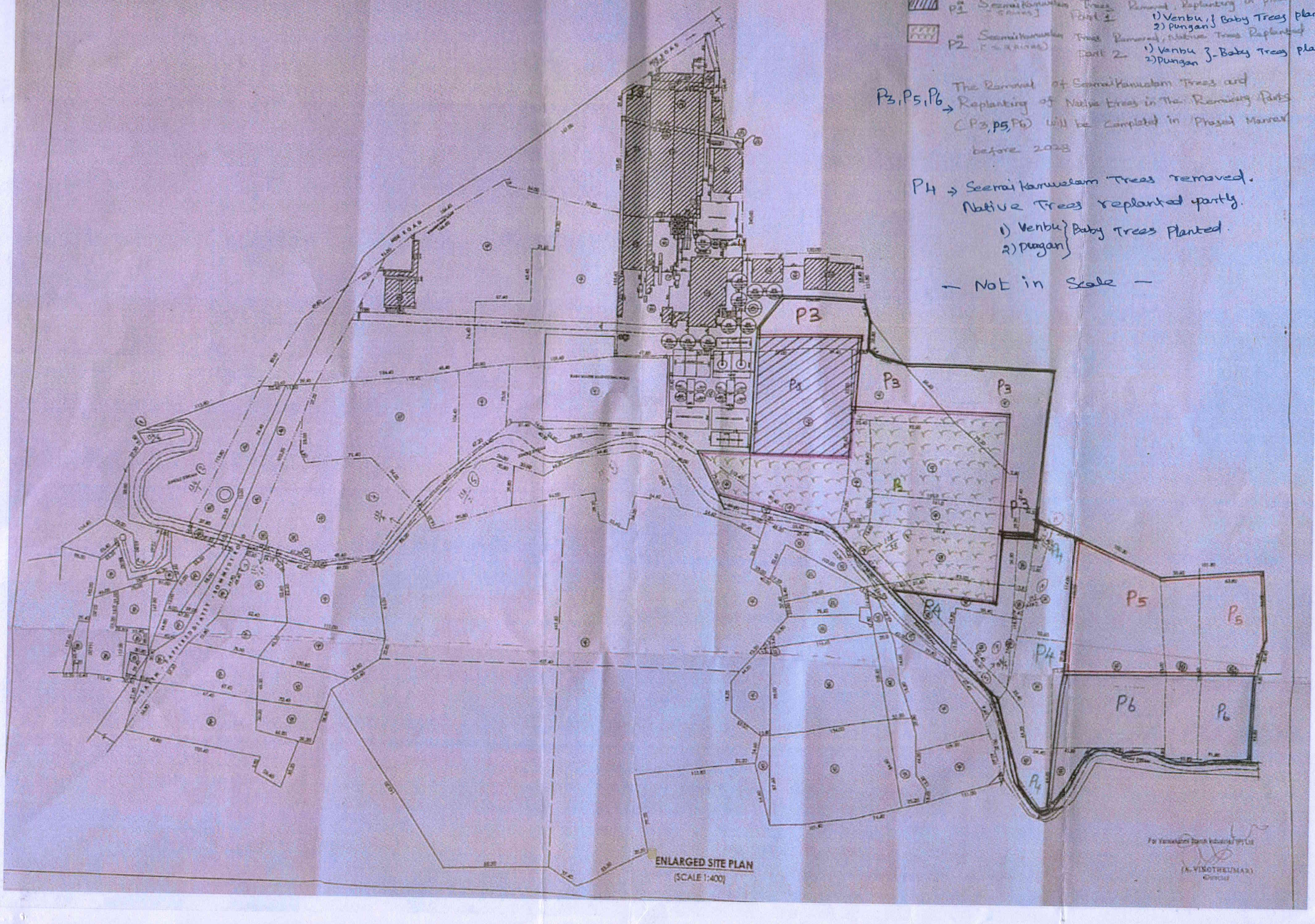
- Green Belt Area.
- P1 Seemai Karuvelam Trees Removed, Replanting in process [Phase 1]
- P2 Seemai Karuvelam Trees Removed, Native Trees Replanted [Phase 2]

Part 1 — 1) Venbu, 2) Pungan } Baby Trees planted
Part 2 — 1) Venbu, 2) Pungan } Baby Trees planted

P3, P5, P6 → The Removal of Seemai Karuvelam Trees and Replanting of Native trees in the Remaining Parts (P3, P5, P6) will be completed in Phased Manner before 2028

P4 → Seemai Karuvelam Trees removed.
Native Trees replanted partly.
1) Venbu } Baby Trees Planted.
2) Pungan }

— Not in Scale —



ENLARGED SITE PLAN
(SCALE 1:400)

For Varalakshmi Starch Industries (P) Ltd
(A. VISOTHKUMAR)

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BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE AT CHENNAI

Appeal No. 77 of 2022

M/s.Varalakshmi Starch Industries (P) Ltd.,
Rep. by its Managing Director V. Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem - 636007. ...Appellant

AND

Tamil Nadu Pollution Control Board
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., ...Respondents

INDEX

S. No.	Date	Description	Pg. No.
	08.06.2025	Affidavit on behalf of the Appellant	1-13

The documents filled above are certified as true copies of their respective Originals

Dated at Chennai on this the 08th day of June, 2025

Appellant

For Varalakshmi Starch Industries (P) Ltd.,

(V. Anbalagan)
Managing Director

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BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE

AT CHENNAI

Appeal No. 77 OF 2022

M/s. Varalakshmi Starch Industries (P) Ltd.,
Rep. by its Managing Director V. Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem - 636007. ....Appellant

AND

Tamil Nadu Pollution Control Board (TNPCB)
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., ...Respondents

AFFIDAVIT ON BEHALF OF THE APPELLANT

I, V. Anbalagan, Son of R. Varadharajan, Hindu, aged about 68 years, having office at "Varalakshmi Tower", 2nd Floor, 127/1 Gandhi Road, Hasthampatty, Salem – 636007, now temporarily come down to Chennai do hereby solemnly affirm and state as under:

I am the Managing Director of the Appellant herein and as such fully acquainted with the facts and circumstances of the present case. I am filing this affidavit on behalf of the Appellant Company.

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

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1. It is respectfully submitted that a Closure Order had been issued by TNPCB to the Appellant industry on 08.11.2022 under Proceeding No. TNPCB/T2/F.025102/DMP/Closure/Water/2022 under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974, as amended, listing out certain directions which were said to be non-fulfilled. The Appellant appealed to the Hon'ble Tribunal, and the Hon'ble Tribunal was pleased to issue a stay order as under against the Closure Order of TNPCB by observing as

   "all those short comings whatever has been pointed out in the impugned order are rectifiable and does not warrant the closure of the unit.

   Therefore, there will be an order of interim stay of the impugned order dated 08.11.2022, and the 4th respondent is directed to restore the power supply immediately on 09.12.2022."

2. It is respectfully submitted that as per the directions of the Hon'ble National Green Tribunal (NGT), Southern Zone in their Order Dt. 16.12.2024, the Respondent TNPCB Dharmapuri intimated vide their letter Dt.23.01.2025 (Letter No. DEE/TNPCB/DMP/F.DMP0013/OL/2025 Dt. 23/01/2025) that an inspection would be conducted on 29.01.2025 at the appellant's entire plant. **Accordingly, the TNPCB officials DEE, AEE and AE have inspected the Appellant unit on 29.01.2025.** They also collected treated waste water samples from ETP, Piezometric Wells 1, Piezometric Wells 2, Piezometric Wells 3 and Jungle Stream Water.

3. It is submitted that during the hearing before the Hon'ble NGT on 13.02.2025, the Ld. Counsel for the Respondent had stated the inspection of the Appellant unit has been completed but the report was yet to be filed and sought time for filing the report and at the request of the Ld. Counsel for the Respondent, the matter was posted for further

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

hearing on 15.04.2025. **In the meantime, further surprise inspection of the Appellant's unit was also conducted on 20.02.2025 and on 21.03.2025** and samples were collected, all of which were reported to be within the discharge standards prescribed by the TNPCB.

4. It is submitted that TNPCB has filed their Inspection Report to the Hon'ble National Green Tribunal (NGT), Southern Zone vide their filing dated 28.04.2025 stating that the Unit and its Effluent Treatment Plant were in operation and further confirming in their report that ***"The official of O/o.DEE, TNPCB Dharmapuri inspected on 29.01.2025 and observed that, the unit was in operation. ETP was also under operation. Latest RoA of the treated effluent sample collected on 29.01.2025 revealed that all parameters are within the standards prescribed by the Board"***.

5. It is further submitted that apart from the inspection conducted by TNPCB officials on 29.01.2025 as per the directions of the Hon'ble National Green Tribunal (NGT), Southern Zone, surprise inspections and collection of treated wastewater and groundwater samples were also undertaken by TNPCB officials on 20.02.2025 and 21.03.2025. The Report of Analysis of all the samples (treated wastewater and groundwater) collected on 29.01.2025, 20.02.2025 and 21.03.2025 provided to the Appellant by TNPCB proves that all the parameters of the treated wastewater are within the discharge standards and groundwater samples from piezometric wells are also within the standards prescribed by TNPCB. These Analysis Reports were submitted to the Hon'ble NGT vide the Appellant's Affidavit dated 14.04.2025.

6. It is submitted that TNPCB in their Inspection Report dated 28.04.2025 have submitted their observed present status of compliance as on 29.01.2025 of the Board's Direction

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

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issued to the Appellant vide Proceedings dated 16.02.2023. TNPCB has reported full compliance with the directions Sl.Nos. 1, 4, 8, 9, 10 and 11 mentioned in the Board's Proceedings dated 16.02.2023 and for the sake of brevity, the same are not discussed hereunder. The appellant's submission as to the compliance in respect of the other directions stated by TNPCB to be partially complied and not complied are as follows:

S.No as mentioned in directions dt 16.02.2023	TNPCB direction dated 16.02.2023	Present Status/Remarks on inspection dt 29.01.2025 as reported by TNPCB	Appellant's submission of its compliance
1	The unit shall furnish a time bound action plan for completing the ETP revamping works, so as to satisfy the treated trade effluent standards prescribed by the Board within a month's time	**COMPLIED**	**COMPLIED**
2	The unit shall furnish a time bound action plan to replace all the SeemaiKaruvelam trees in the premises with the native species as recommended by the Agriculture Department along with the proposal for safe disposal of entire quantity of treated effluent with adequate green belt area within 15 days.	**PARTIALLY COMPLIED.** The layout of the Greenbelt area furnished by the unit has been mentioned that the removal of seemai karuvelam trees will be completed before 2028 in phased manner.	The Appellant has already long started replacing the Seemaikaruvelam trees with native spices in a **phased manner** as it will take minimum 5 years for any native spices to grow. Due to this practical reason, the replacement of Trees is done in a **phased manner**. As on date, in the Greenbelt area comprising of 38 acres, Seemaikaruvelam trees in 25 acres are removed and replanted with Native trees.

For Varalakshmi Starch Industries (P) Ltd

(V. ANBALAGAN)
Managing Director

			Within another 3 years i.e. within the year 2028, the remaining Seemaikaruvelam trees will be replaced also. Since the Seemaikaruvelam trees in nearly 70% of the green belt area have been replaced and the removal in rest of the area is ongoing, the report of the TNPCB as "partially complied" is incorrect.
3	The unit shall furnish the layout of the premises marking the green belt area that are being maintained for utilization of treated effluent along with the plantation details such as number of plants, name of the plants species, plantation area etc. within 15 days	**PARTIALLY COMPLIED.** The Unit has furnished the layout of the premises marking the green belt area for utilization of treated effluent. However, the unit has not furnished the plantation details of fresh tree saplings such as number of plants, name of the plants species, plantation area etc.	In the 25 Acres already planted, the details of the Trees planted are: • Neem saplings-5800 nos • Magkani saplings-1000 nos • Naaval saplings-200 nos • Pungam saplings-1300 nos • Casurina saplings-4100 nos **Total: 12400 nos of tree saplings.** The Layout of the greenbelt has already been earlier submitted and received by TNPCB. Therefore, the report of the Respondent as "partially complied" is incorrect.
4	The unit shall cover the storage area of wet tapioca thippy by providing a shed within a month's time	**COMPLIED**	**COMPLIED**

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5	The unit shall conduct water and wastewater audit through reputed institution like Anna university, Chennai/IIT Madras and furnish report to the Board. The time bound action plan for the same shall be furnished within a month's time, as the unit has made payment to the Anna University, Chennai to carry out ETP Adequacy study only and not for the water and wastewater audit as directed by the Board vide proceeding 17.10.2022	**NOT COMPLIED** The District Environmental Engineer, Dharmapuri has reported that, the unit had submitted the adequacy report of ETP obtained from the Anna University, Chennai. Earlier, the unit in its letter dated 11.07.2023 has informed that "the Project given to Anna University to conduct water audit, waste water audit and ground water quality study they haye raised demand that demand also we paid. The project will be completed withinin six months". After that the unit vide letter dated 25.04.2024 stated that "the Anna University wants access to our entire production plant apart from the ETP and wants to inspect stage wise our production plant which requires us to allow then access to our production machineries and production technology and knowhow. Since we fear that allowing third party access to our	At the request of the Appellant, the Environment Department of Anna University conducted the study and provided their comprehensive combined adequacy report containing (1) Production process with Raw water usage, (2) Wastewater treatment (ETP), (3) Disposal of treated wastewater and (4) Groundwater analysis In the combined Adequacy report issued by Anna University after 6 months study, in Chapter 2 of the report, the production process with flow charts has been reported showing the volume of raw water consumed and wastewater generated and how the Unit is minimizing the water consumption by the process of recycling the process water within the process. In Chapter 3 of the report, the wastewater treatment process has been reported with process description, flowchart with flowrate of each treatment process has been reported.

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		production unit will compromise our technology knowhow, the audit is held up." The unit has not yet conducted the water and wastewater audit through reputed institution like Anna University, Chennai/IIT Madras as directed by the Board.	Without taking this into cognizance, the Respondent simply states that this direction is not complied. If more specifically water and waste water audit is wanted, the Anna University requires entire manufacturing plant inside details with all data which are based on our valuable international Standard manufacturing technology. In India only in Tamil Nadu, only 3 industries are having such world high-tech machines with technology which is highly paid and valuable. But the TNPCB is enforcing this audit for the Appellant Industry alone and not for the other two industries located within the jurisdiction of TNPCB in Namakkal and Erode (Perundurai) Districts.
6	The unit shall conduct ground water quality study through reputed institution like Anna University, Chennai / IIT Madras in the green belt areas that are being maintained utilizing the treated effluent and furnish the report to the Board within a month's time.	**NOT COMPLIED** The District Environmental Engineer, Dharmapuri has reported that, the unit had submitted the adequacy report of ETP obtained from the Anna University, Chennai. However, the unit has not yet conducted ground water quality	Anna University also conducted the study of ground water. The test report is given in page No.30, Sl.No.12 & 13 of their adequacy report. Further, as per directions of TNPCB, the Appellant have provided piezometric wells in the greenbelt area and samples of groundwater are being

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		study in the green belt areas through reputed institution like Anna University, Chennai/IIT Madras in the green belt area as directed by the Board.	drawn from them for the past 8 months by the TNPCB officials themselves and have been tested in their own lab for studying and monitoring the groundwater quality. Also, during the inspection on 29.01.2025, recently on 20.02.2025 and 21.03.2025, samples of groundwater have been collected and analyzed by TNPCB officials from the Piezometric wells.
7	The unit shall provide adequate piezometric (monitoring wells) in the green belt area to monitor the ground water quality and furnish the report to the TNPCB regularly in view of repeated complaint received. An action plan shall be submitted within a month's time.	**PARTIALLY COMPLIED.** The official of O/o. DEE, TNPCB, Dharmapuri inspected the unit on 29.01.2025 and observed that the unit has provided 03. Nos. of piezometric (monitoring) wells in the green belt areas to monitor the ground water quality. However, the unit has not provided at north-eastern side of the green belt area, where the allegation of contamination of groundwater was raised by the complainant. Further, the following was submitted in the previous reports that "in order to assess the impact of waste	The Appellant has already provided 3 Piezometric (monitoring) wells in different areas covering the entire Greenbelt Area. The TNPCB has never indicated the places where Piezometric (monitoring) wells have to be installed. We have already committed to install additional piezometric well in the greenbelt wherever TNPCB insists once the monsoon is over and the same will be completed before the commencement of the forthcoming tapioca season. The TNPCB officials have already been inspecting the same and samples are being drawn from three piezometric wells regularly and tested to monitor groundwater quality.

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		water disposal on land, an exhaustive Hydrogeological study is requisite to be carried out in and around the unit's premises through reputed agency."	
8	The unit shall stop discharging treated/ untreated trade effluent through the outfall located near ETP area into the Peeniar canal immediately and shall ensure that there is no access for the treated/untreated trade effluent to nearby water bodies, outside the premises either directly and indirectly. The action taken in this regard shall be reported to the Board within a week's time.	**COMPLIED**	**COMPLIED**
9	The unit shall dewater the stagnation of water in the pit provided for the proposed anaerobic reactors immediately and shall maintain the sludge drying beds properly and shall report to the Board within a week's time.	**COMPLIED**	**COMPLIED**
10	The unit shall check the stability of the ETP, by engaging reputed institution like Anna University, Chennai/IIT Madras and	**COMPLIED**	**COMPLIED**

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	furnish the report to the TNPCB within a month's time.		
11	The unit shall install / maintain Electro Magnetic Flow Meter with computer recording arrangement at the inlet and outlet of the ETP within a month's time and shall furnish monthly report to the Board.	**COMPLIED**	**COMPLIED**
12	In order to ensure the compliance of all the above said directions 1 to 11. the unit shall furnish a Bank Guarantee for Rs.50 Lakhs valid for one year to the TNPCB within a month's time (Format enclosed)	**NOT COMPLIED** The DEE, TNPCB, Dharmapuri has reported that the unit has not furnished Bank Guarantee for Rs.50 Lakhs as directed by the Board.	Therefore, with the TNPCB themselves confirming vide their Inspection report dated 28.04.2025 that the Unit's ETP is meeting the standards prescribed by the Board and indicating compliance in regard to the 9 of the 11 directions, the Appellant is requesting for waiver of furnishing the Bank Guarantee for Rs.50 lakhs which would cast financial burden on us since BG can be obtained from Bank only against 100% margin money from working capital. The appellant has also submitted representations in this regard to TNPCB which has not been considered so far. The objective behind furnishing of Bank Guarantee is to secure guarantee for compliance of the directions

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			issued by TNPCB. As long all the primary directions are reported to be complied, we request that this condition of furnishing Bank Guarantee of Rs.50 lakhs may be caused to be waived.
13	The unit shall ensure the compliance of all the above said conditions and furnish the compliance report to the Board so as to examine the issue of renewal of consent to the unit		The Appellant have furnished all compliance report in respect of 12 directions discussed above to the TNPCB. In respect of the directions vide Sl.No.12, we have requested for waiver of Bank guarantee. Hence, renewal of consent and revocation of closure order shall be considered.

7. It is submitted that the appellant industry is a rural agro-based medium-scale industry manufacturing Starch and Sago out of seasonal and highly perishable raw material. In a year, around 5 to 7 months only the plant is utilizable due to the seasonal availability of raw material viz. Tapioca Tuber. It is submitted that due to the non-availability of valid Consent Order, all their international customers and Indian big customers hard earned over the last twenty years have stopped their purchases resulting in a significant decline in sales turnover. It is submitted that there are financial losses not only to our company but also to the farmers in and around Dharmapuri District in selling their tapioca at a loss at Rs.4500/- to 5000/- per MT against Rs.10000/- to 11000/- prevailing previously.

8. It is submitted that the Appellant industry is in fulfilment of the conditions imposed while obtaining the original Consent Order to Establish and Operate and has been

For Varalakshmi Starch Industries (P) Ltd

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periodically renewing its Consent from Year 1997 until recently. There were no instances of violations and deterrent actions taken by the TNPCB till recently. For the past 3 years, without a valid Consent Order, the industry has been operating pursuant to the stay granted by the Hon'ble Tribunal.

9. It is submitted that during the hearing dated 16.12.2024, the Hon'ble Tribunal observed that the Closure Order was issued by TNPCB under Sec 33A without considering the submissions made by the Appellant in response to the proceedings and the Hon'ble Tribunal decided to conclude the issue based on the test reports of Treated Waste Water samples collected from our industry after an inspection. Accordingly, the TNPCB inspected the unit on 29.01.2025, 20.02.2025 and 21.03.2025 and collected samples and issued Reports showing that all parameters are within the prescribed standards. The report on the inspection filed by TNPCB indicates positive development in regard to the 9 directions and most importantly concludes that the ETP is meeting the discharge standards prescribed by TNPCB. The remaining are furnishing of Bank Guarantee, ground water study and water audit. It is submitted that these three requirements are only secondary and in so far as the other directions show positive results, the remaining three could be considered for waiver. It is also submitted that these objective behind the above three is only to secure positive results in compliance with PCB norms.

10. It is humbly prayed that the Hon'ble National Green Tribunal (NGT) may be pleased to pass orders for causing withdrawal of the closure order and issue directions to TNPCB to issue renewal of Consent to the Appellant unit, as we are already eligible for deemed consent renewal as per Section 25(7) of the Water (Prevention and Control of Pollution) Act, 1974, so that we can re-establish the market and continue our operations.

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(V. ANBALAGAN)
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11. It is submitted that the Appellant industry is in perilous situation and looking at the Hon'ble Tribunal to come to its rescue to save it.

12. It is humbly prayed that the Hon'ble Tribunal may be pleased to direct that in the event of any future issues pertaining to the appellant factory, the TNPCB before taking any adverse steps may follow the due process of law and principles of natural justice by way of issuance of notice, followed by show cause notice clearly outlining the issues and providing an opportunity for personal hearing before initiating any coercive action.

13. Therefore, it is humbly prayed that this Hon'ble National Green Tribunal (NGT) may be pleased to pass such further order or other orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstance of this case and thus render justice to save this rural agro based exporting industry.

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BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE AT CHENNAI

Appeal No. 77 of 2022

M/s. Varalakshmi Starch Industries (P) Ltd.,
Rep. by its Managing Director V.Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem- 636 007. ...Appellant

AND

Tamil Nadu Pollution Control Board
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., ...Respondents,

AFFIDAVIT FILED BY THE APPELLANT

DATE: 08.06.2025

Annexure No:3

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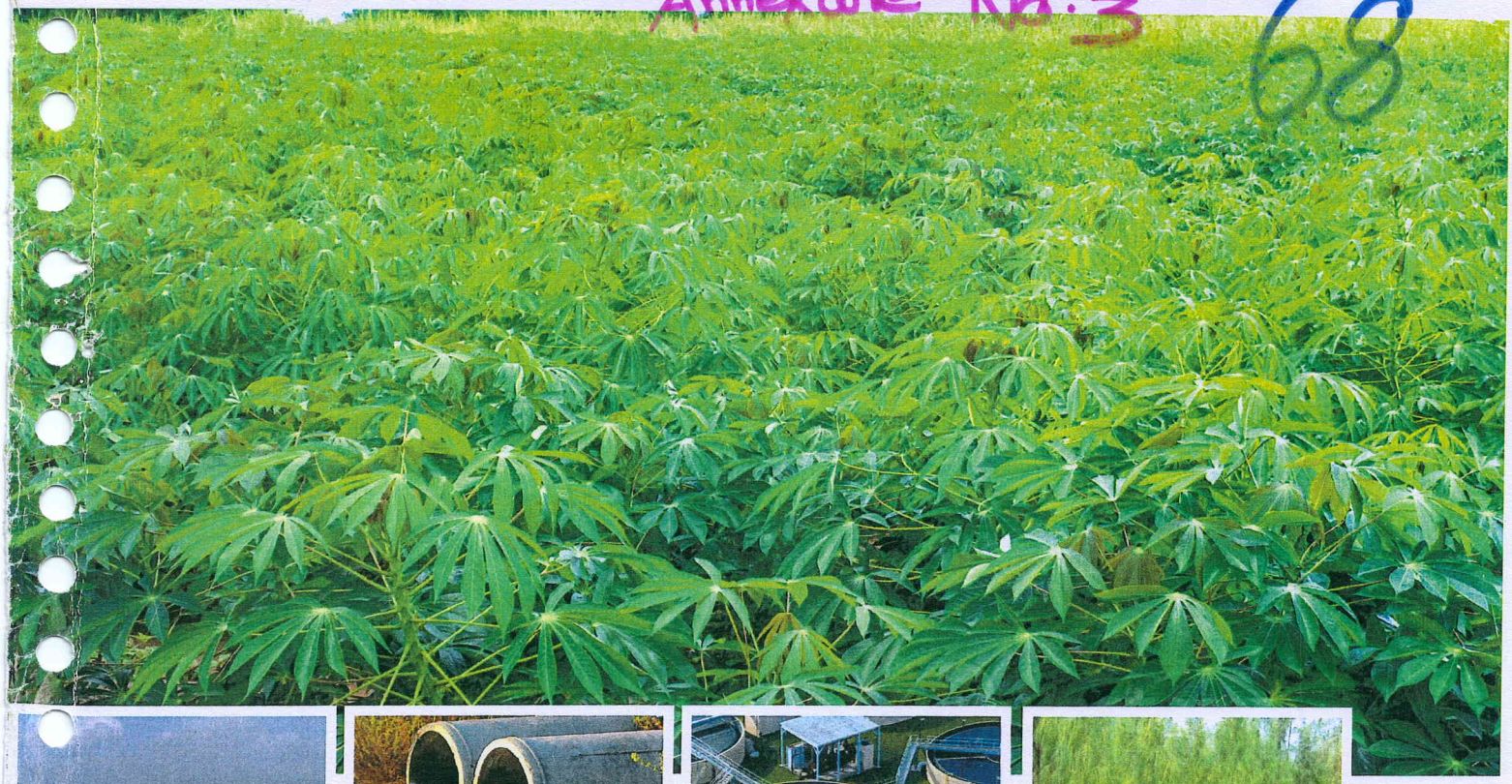

Report for

Economic and Environmental Impact of Sago Industry Effluent on Ground Water Quality: A Physicochemical, Metal and Microbial Assessment

Submitted By
The Dean (Agriculture)
Agricultural College and Research Institute
Tamil Nadu Agricultural University
Coimbatore - 641 003

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Report on

Economic and Environmental Impact of Sago Industry Effluent on Groundwater Quality: A Physicochemical, Metal, and Microbial Assessment

Submitted by

The Dean (Agriculture)
Agricultural College & Research Institute
Tamil Nadu Agricultural University
Coimbatore- 641 003

PROGRESS REPORT

1. **Title of the project** : Economic and Environmental Impact of Sago Industry Effluent on Groundwater Quality: A Physicochemical, Metal, and Microbial Assessment
2. **Project duration** : Three Months
3. **Objectives** :
   - To survey and collect the water samples the entire green belt area within industrial premises (Open wells, piezometric wells, bore wells, and rainwater harvesting and artificial recharge wells)
   - To determine the concentrations of the physico-chemical and microbiological quality parameters of collected water samples.
   - To assess the levels of heavy metals (Fe, Pb, Zn, Cd, and Cr) in collected water samples
   - To study the Economic and Environmental Impact through the quantify ground water pollution by monitored heavy metals in the study area using Pollution Load Index, Geo-accumulation Index, Enrichment Ratio and Contamination Degree of drinking ground water samples.

About Varalakshmi Starch Industries (P) Ltd.

Varalakshmi Starch Industries (P) Ltd was established in the year 1995 as a rural agro-based medium-scale industry for the manufacture of super high-grade starch and sago products. Varalakshmi Starch Industries (P) Ltd is a composite, integrated, and the largest unit engaged in the manufacture of Tapioca Starch, Tapioca Sago, Maize Starch, at par with international standards using Tapioca tuber and Maize (Corn) in India. It is the first ISO 9001, 14001, 18001 certified company in India in the field of Starch and Sago. It is the first industry to produce and export international standard Tapioca Starch in India.

The industry was the first to produce Tapioca-based Starches that led to large-scale import substitution of our products in India. It is the only unit in India with accreditation of BIS Certification for both edible-grade Tapioca Starch and Tapioca Sago. It is licensed by the Central & State FSSAI (Food Safety and Standards Authority of India). It is the first integrated starch industry in India with the facility to process Tapioca and Maize in a single premise,

adopting the latest technology by installing world-class, fully automated machinery imported from various European and U.S. countries for the continuous process, untouched by hands, engaged in a hygienic atmosphere with an installed capacity to process 800 tons per day of Tapioca and 400 tons per day of Maize.

A fully well-equipped lab with imported machinery in-built ensures testing the quality of products at all stages of the process, ensuring excellence in compliance with domestic and international standards. Owing to its rigorous maintenance of quality by setting a Zero-Defect Goal as the only acceptable level of performance, the industry has developed a reputed regular customer/clientele base from over 25 countries across the world. Products are being exported to South Africa, Denmark, Japan, Germany, Netherlands, Malaysia, Sri Lanka, Mexico, Saudi Arabia, Taiwan, New Zealand, Canada, Norway, Dubai, Oman, Jordan, Nepal, Bangladesh, Egypt, Qatar, Sweden, etc. For the first time in India, about 25,000 MT of its tapioca starch products were exported.

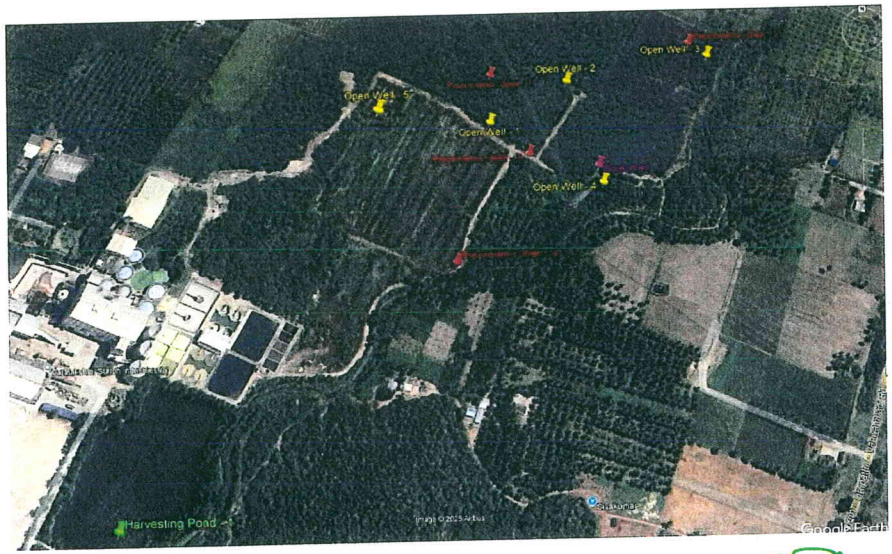
The industry facilitates the rural, tribal, small, and tiny farmers of the dry region to get assured markets and remunerative prices for their agricultural produce by directly procuring from the farmers, eliminating the middlemen. It is also engaging around 1000+ rural workforce directly & indirectly in day-to-day operations throughout the year, and that's why the industry is being constantly and continuously recognized by both State & Central Government of India and has received many prestigious awards for its activities and

achievements in promoting rural agro-based industries, for producing quality products, and creating value addition for agricultural produce.

Varalakshmi Starch Industries (P) Ltd has set up under UNDP Demonstrations plant by adapting The Technology given by New Jersey institute of Technology in the year 2002, Bio-Methanation plant to generate 30,000 m^3 biogas per day from starch processing wastewater, which is further used to fuel biogas gensets to generate up to 2 MW of renewable power. This has led to a reduction in methane emissions to the atmosphere by capturing the methane in bio digesters, and the captured methane is utilized for thermal applications and power generation, replacing HSD and furnace oil and its associated greenhouse gas emissions.

Sample collection Locations

S. No	Particulars	Latitude	Longitude
1	Open Well	11.899024°	78.377771°
2	Piezometric Well	11.899599°	78.377824°
3	Piezometric Well	11.898617°	78.378133°
4	Open Well	11.899458°	78.378631°
5	Piezometric Well	11.899825°	78.380013°
6	Open Well	11.899654°	78.380182°
7	Open Well	11.898235°	78.378846°
8	Bore Well	11.898425°	78.378829°
9	Open Well	11.899253°	78.376601°
10	Piezometric Well	11.897514°	78.377302°
11	Rainwater Harvesting Pond	11.895043°	78.374386°



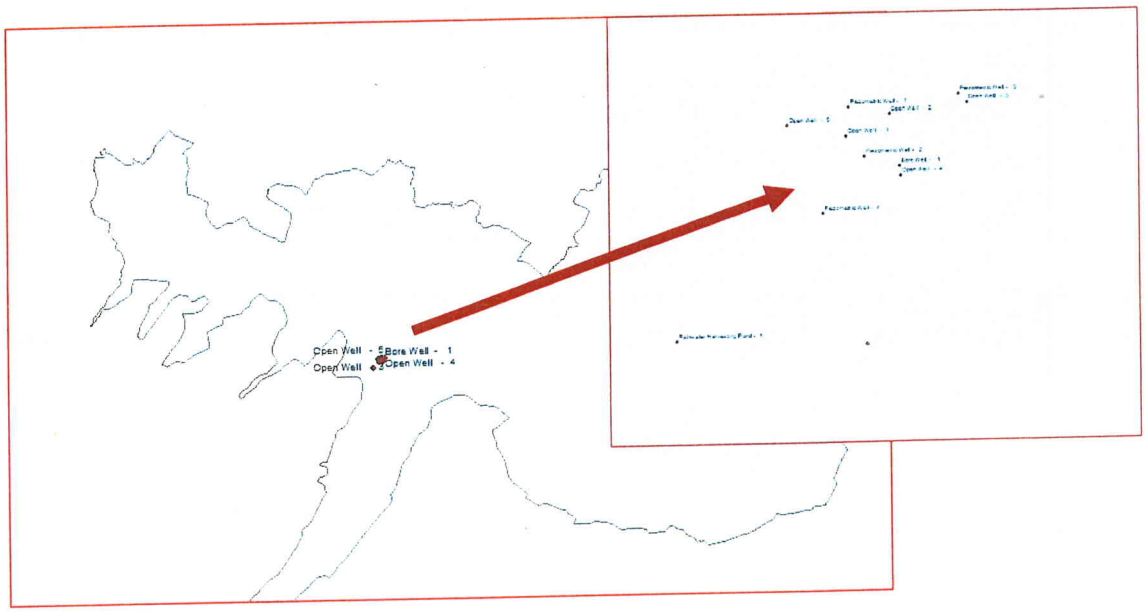


Fig. 1. Soil and Water sampling locations

Methodology:

Methodology followed in the physico-chemical and microbial analyses of the water samples are detailed below.

Table. 1. Standard Methods for physico-chemical and microbial analyses of water samples

Particulars	Unit	Remarks	References
Physico-chemical properties			
pH	-	Soil:Water suspension @1:2.5	Jackson (1973)
EC	dS m^{-1}	Soil:Water suspension @1:2.5	Jackson (1973)
Organic carbon	per cent	Wet digestion method	Walkley and Black (1934)
Available N	kg ha^{-1}	Alkaline permanganate method	Subbiah and Asija (1956)
Available P	kg ha^{-1}	Photoelectric colorimeter at 660 nm	Olsen *et al.* (1954)
Available K	kg ha^{-1}	Flame photometer	Stanford and English (1948)
Exchangeable Na	cmol (p^+) kg^{-1}	Ammonium acetate (Flame photometer)	Jackson (1973)
Exchangeable Ca	cmol (p^+) kg^{-1}	Versanate titration method	Jackson (1973)
Exchangeable Mg	cmol (p^+) kg^{-1}	Versanate titration method	Jackson (1973)

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Coimbatore - 641 003

Exchangeable K	cmol (p^+) kg^{-1}	Ammonium acetate extract (Flame photometer)	Jackson (1973)
Exchangeable Sodium Percentage (ESP)	per cent	$\frac{Na^+}{Na^+ + Ca^{++} + Mg^{++} + K^+} \times 100$	Saxena *et al.* (1978)
Available heavy metals	mg kg^{-1}	DTPA extract analysis in MP-AES	O'Connor (1988)
Microbial properties			
Bacteria	x 10^6 CFU g^{-1}	Nutrient agar	Waksman and Fred (1922)
Fungi	x 10^4 CFU g^{-1}	Martin's rose bengal agar	
Actinomycetes	x 10^2 CFU g^{-1}	Ken Knight's agar	

Table. 2. Standard methodology for the analyses of water samples

Parameters	Unit	Method	Reference
pH	-	Measured using digital pH meter	Jackson (1973)
EC	dS m^{-1}	Measured using conductivity bridge (CM 180 Elico conductivity bidge)	Jackson (1973)
DO	mg L^{-1}	Azide modification iodimetric method	APHA (1980)
BOD	mg L^{-1}	Incubation method	Gupta (2002)
COD	mg L--1	Refluxed for 2 hrs and titrated against 0.5N FAS using ferroin indicator	Gupta (2002)
Organic Carbon	per cent	Chromic acid wet digestion method	Walkley and Black (1934)
Phosphorus	mg L^{-1}	Photoelectric colorimeter at 660 nm	Olsen *et al.*, (1954)
Carbonates	mg L^{-1}	Titrating with 0.1N H_2SO_4 using phenolphthalein indicator	Piper (1966)
Bicarbonates	mg L^{-1}	Titrating with 0.1N H_2SO_4 using methyl orange indicator	Piper (1966)
Calcium	mg L^{-1}	Versenate titration method	Jackson (1967)
Magnesium	mg L^{-1}	Versenate titration method	Jackson (1967)
Sodium	mg L^{-1}	Flame photometer	Jackson (1967)
Potassium	mg L^{-1}	Flame photometer	Jackson (1967)
Chloride	mg L^{-1}	Mohr's method	Jackson (1967)
Sulphates	mg L^{-1}	Turbidimeteric method	Jackson (1967)

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Results:

Characterization of water samples in the bench mark sites

pH, EC, TDS and TSS

The pH of all piezometer, pond, bore well and open well water samples range from 7.40 to 8.40, slightly alkaline to moderately alkaline and lies well within the treated trade effluent standards as well as the range prescribed for irrigation effluents. This indicates no immediate acidity/alkalinity hazard, although values approaching the upper irrigation limit in some open wells suggest long-term monitoring.

Electrical conductivity and total dissolved solids are moderate but remain within the acceptable range below the irrigation limit of 2100 mg/l, suggesting suitability for irrigation though with some salinity load. Total suspended solids are low and far below the limit for treated trade effluent discharge, indicating limited particulate pollution in all samples. All water samples are colourless and free from foul odour, which indicates the absence of obvious contamination or industrial colouring. Turbidity is either below detection or very low in the measurable samples, implying good clarity of the water sources.

DO, BOD, COD

Dissolved oxygen is generally between 1.0 – 2.0 mg/l in Piezometers and reaches higher values of upto 3.0 mg/l in open wells, pond and bore well, reflecting better aeration and lower organic load at these locations compared to piezometers. The DO levels of 1 - 2 mg/l combined with BOD levels of 8 – 12 mg/l and COD levels of 26 – 36 mg/l in piezometer subsurface waters in the greenbelt indicates that the organic matter in the treated trade effluent discharged in the greenbelt area are within the standards for discharge of treated trade effluent.

Biological oxygen demand values of 8 – 12 mg/l in piezometer samples, BOD values of 2 – 8 mg/l in open wells, pond and bore well, Chemical oxygen demand follows a similar pattern, with piezometers and open wells recording COD levels ranging between 12 – 40 mg/l indicating that the organic matter in the treated trade effluent discharged in the greenbelt area are within the standards for discharge of treated trade effluent and have no effect on the groundwater quality.

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Nitrogen and phosphate contaminants

Ammoniacal nitrogen, nitrate-N, nitrite-N and phosphate are predominantly below detection or present at very low concentrations, all well below standards for discharge of treated trade effluent, suggesting absence of acute nutrient pollution or eutrophication risk at the time of sampling.

Ions, salinity and fluoride

Sulphate, chloride, carbonate, bicarbonate, calcium and magnesium concentrations in all samples lie within the standards for discharge of treated trade effluent and irrigation effluent limits, indicating that hardness and salinity are moderate but not excessive. Sodium levels are relatively high in several open wells and piezometers, yet calculated sodium adsorption ratio (SAR) values remain well below the critical threshold of 26, showing no sodium hazard for irrigation.

Residual sodium carbonate values are mostly negative or low positive and remain within the safe limit of 5 mq/l, further confirming that none of the waters pose an RSC-related sodicity risk to soils. Fluoride, however, exceeds the upper permissible limit for drinking water (1.5 mg/l) in most piezometer and open well samples, while the bore well remains within the acceptable range, indicating localized fluoride enrichment and restricting many sources for safe drinking use.

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Sri Varalakshmi Starch Industries – Greenbelt water samples

S. No.	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Standards for discharge of treated trade effluent for irrigation
		Peizometer 1	Peizometer 2	Peizometer 3	Peizometer 4	Open Well 1	Open Well 2	Open Well 3	Open Well 4	Open Well 5	Pond	Bore well	
1.	pH	7.40	7.80	7.70	7.40	8.20	7.90	8.30	8.40	7.40	7.90	8.00	5.5 – 9.0
2.	EC (dS m^{-1})	2.03	1.87	1.91	2.10	2.41	2.58	2.20	2.67	2.77	1.60	0.21	-
3.	Odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	Absence of Foul odour	-
4.	Colour	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	-
5.	Turbidity (NTU)	*BDL	*BDL	0.30	*BDL	2.50	*BDL	*BDL	*BDL	1.60	*BDL	1.7	-
6.	Dissolved Oxygen (mg/l)	1.00	2.00	2.00	1.50	2.00	3.00	3.00	3.00	2.5	3.0	5.4	-
7.	Biological Oxygen Demand (mg/l)	12	8	10	12	14	6	5	5	8	5	2	<30 (BOD_3)
8.	Chemical Oxygen Demand (mg/l)	36	26	28	28	40	16	16	24	36	24	12	<250 (COD)

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S. No.	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Standards for discharge of treated trade effluent for irrigation
		Peizometer 1	Peizometer 2	Peizometer 3	Peizometer 4	Open Well 1	Open Well 2	Open Well 3	Open Well 4	Open Well 5	Pond	Bore well	
9.	Total Dissolved Solids (mg/l)	1318	1216	1247	1364	1558	1668	1428	1736	1801	1042	136	<2100
10.	Total Suspended Solids (mg/l)	26	32	24	32	42	40	36	45	42	56	16	<100
11.	Sulphate (mg/l)	34	24	26	33	15	27	25	32	30	29	*BDL	<1000
12.	Chloride (mg/l)	371	323	275	310	412	583	583	564	489	305	38	<1000
13.	Carbonate (mg/l)	11	11	27	21	39	24	36	27	57	12	*BDL	-
14.	Bicarbonate (mg/l)	509	498	569	587	503	552	363	586	660	314	52	-
15.	Calcium (mg/l)	116	101	83	112	158	123	92	112	132	77	16	-
16.	Magnesium (mg/l)	40	48	41	54	70	67	60	75	77	36	9	-
17.	Sodium (mg/l)	207	181	166	209	119	266	217	234	203	146	*BDL	-
18.	Potassium (mg/l)	16	5	32	20	91	*BDL	*BDL	35	118	*BDL	*BDL	-

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S. No.	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Standards for discharge of treated trade effluent for irrigation
		Peizometer 1	Peizometer 2	Peizometer 3	Peizometer 4	Open Well 1	Open Well 2	Open Well 3	Open Well 4	Open Well 5	Pond	Bore well	
19.	Ammoniacal N (mg/l)	*BDL	*BDL	*BDL	*BDL	0.56	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	<50
20.	Nitrate N (mg/l)	0.28	0.28	0.28	0.28	*BDL	*BDL	*BDL	*BDL	*BDL	0.28	*BDL	-
21.	Nitrite N (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	-
22.	Phosphate (mg/l)	*BDL	*BDL	*BDL	*BDL	0.88	*BDL	*BDL	*BDL	1.05	*BDL	*BDL	-
23.	Oil and Grease (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<10*
24.	Total Phenol (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	<1
25.	Total Lead (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<0.1*
26.	Total Chromium (mg/l)	*BDL	*BDL	*BDL	*BDL	1.2	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<2*
27.	Total Nickel (mg/l)	*BDL	*BDL	*BDL	*BDL	1.0	0.05	*BDL	*BDL	*BDL	*BDL	*BDL	*<3.0*
28.	Total Cadmium (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<2*

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S. No.	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Standards for discharge of treated trade effluent for irrigation
		Peizometer 1	Peizometer 2	Peizometer 3	Peizometer 4	Open Well 1	Open Well 2	Open Well 3	Open Well 4	Open Well 5	Pond	Bore well	
29.	Total Fluoride (mg/l)	1.5	1.5	1.8	2	2	1.5	1.5	1.8	2.2	1.2	0.5	<2.0
30.	Total Mercury (mg/l)	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<0.01*
31.	Total Copper (mg/l)	*BDL	*BDL	*BDL	*BDL	0.6	*BDL	*BDL	*BDL	*BDL	*BDL	*BDL	*<3*
32.	Sodium absorption Ratio (meq/l)	5.96	5.23	5.25	5.72	2.79	6.75	6.09	5.91	4.89	4.85	0.00	-
33.	Residual sodium carbonate (meq/l)	-0.42	-0.52	2.66	0.22	-4.19	-1.88	-2.45	-1.34	-0.30	-1.30	-0.70	-
34.	Bacteria (CFU/ml)	1	2	1	2	2	1	1	1	2	2	Nil	-
35.	Fungi (CFU/ml)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	-
36.	Actinomycetes (CFU/ml)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	-
37.	Total Coli forms (MPN/100 ml)	23	11	9	11	28	Nil	4	Nil	9	23	Nil	-

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S. No.	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Standards for discharge of treated trade effluent for irrigation
		Peizometer 1	Peizometer 2	Peizometer 3	Peizometer 4	Open Well 1	Open Well 2	Open Well 3	Open Well 4	Open Well 5	Pond	Bore well	
38.	E. coli forms (MPN/100 ml)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	-
39.	Salmonella (No./100 ml)	Nil	Present	Present	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	-

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Trace metals, oil, grease and phenol

Most heavy metals including lead, cadmium, mercury, oil and phenols are below detection in all samples, which is favourable in terms of toxic metal contamination. Chromium and nickel are also mostly below detection in most samples except Chromium in open well 1 showing level of 1.2 mg/l and Nickel in open well 1&2 showing level of 1.0 and 0.05 mg/l respectively but these levels are also still below standards for discharge of treated trade effluent, all indicating that the discharge of treated trade effluent in the greenbelt area has not resulted in any noticeable contamination of heavy metals in the groundwater.

Microbial parameters

Bacterial counts are low but several samples contain total coliforms and some show Salmonella, while E. coli is absent in all samples. The presence of coliforms and Salmonella indicates faecal or environmental contamination and means that microbiological treatment or disinfection is essential before using these waters for drinking.

Conclusion

A total of 11 samples of groundwater from various Piezometer wells, Open Wells, Bore Well and Pond were collected from the greenbelt area that was maintained utilizing the treated trade effluent of Varalakshmi Starch Industries at Pappiredipatti. The Analytical results of all these samples are enclosed with this report. The physiochemical and organic inference drawn from the analytical results have been given in this report and overall, it can be concluded that there has been no noticeable deterioration in the ground water quality in the study area of the greenbelt due to the discharge of the industry's treated trade effluent.

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Agri. College & Res. Instt.
Tamil Nadu Agricultural University
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Dean (Agriculture)
Agri. College & Res. Instt.
Tamil Nadu Agricultural University
Coimbatore - 641 003

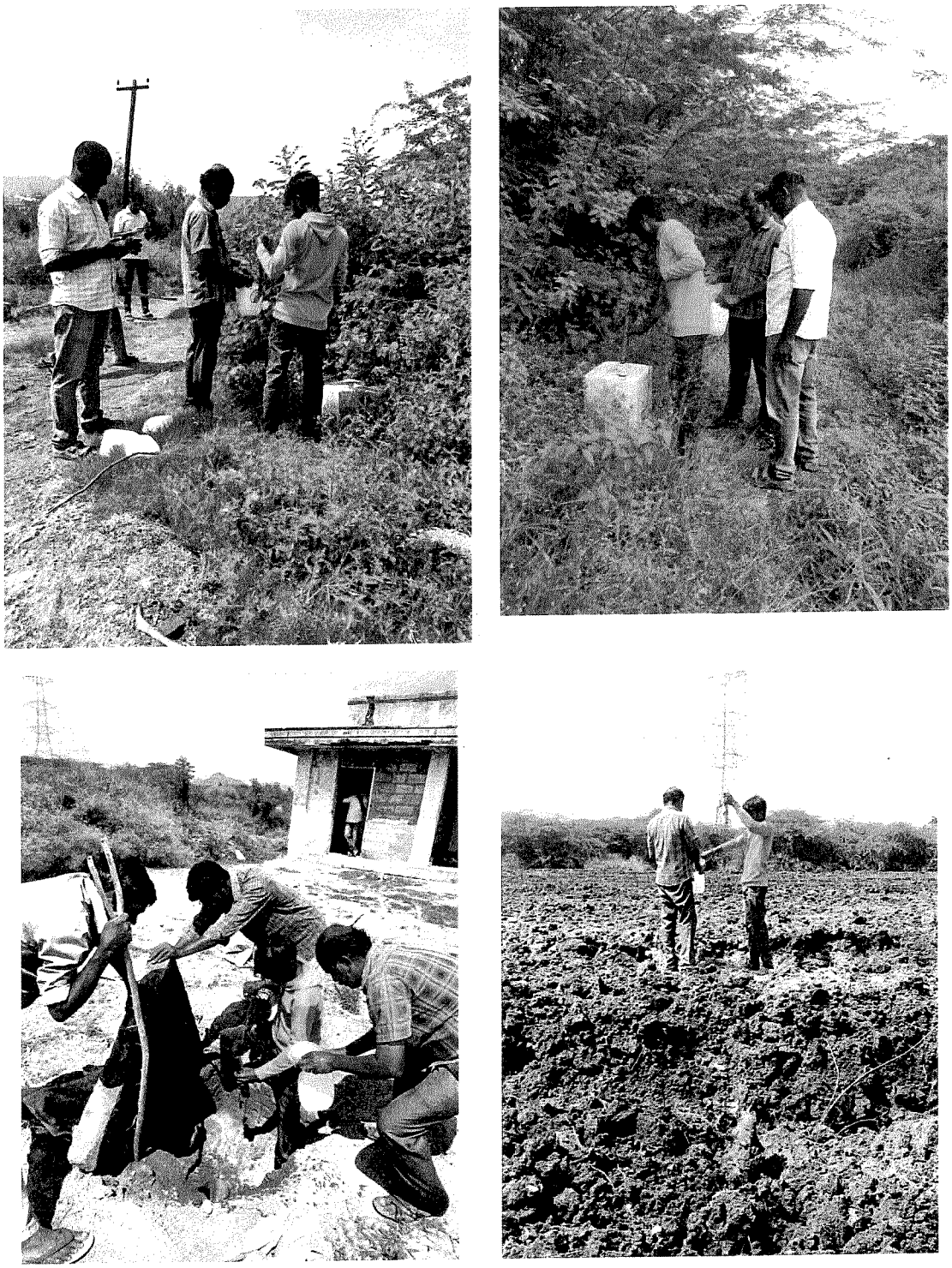

Plate 1: Collection of Peizometer Water Samples

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Plate 2: Collection of Open Well Water Samples

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Agri. College & Res. Instt.
Tamil Nadu Agricultural University
Coimbatore - 641 003

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DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL REPORT

Nature of Sample : Water Sample No.1 - Piezometer 1
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.

Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.40	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.03	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	1.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	12	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	36	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1318	Total Fluoride (mg/l)	1.5
Total Suspended Solids (mg/l)	26	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	34.45	Total Copper (mg/l)	*BDL
Chloride (mg/l)	371	Sodium Absorption Ratio	5.96
Carbonate (mg/l)	11	Residual Sodium Carbonate (meq/l)	-0.42
Bicarbonate (mg/l)	509	Bacteria (CFU/ml)	1
Calcium (mg/l)	116	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	40	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	207	Total Coli forms (MPN/100 ml)	23
Potassium (mg/l)	16	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	0.28		

BDL-Below Detectable Limit

Note: The above results are communicated with the following conditions.

- The results indicate only the actual content of parameters requested by the stakeholders for the samples provided by them.
- In no way, this can be claimed as a complete composition / makeup of the sample
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12/12/25

Associate Professor
Dept. of Env. Sciences

12/12/25

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : envi ronment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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Nature of Sample : Water Sample No.2 - Piezometer 2
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.

Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.80	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	1.87	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	2.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	8	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	26	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1216	Total Fluoride (mg/l)	1.5
Total Suspended Solids (mg/l)	32	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	24.4	Total Copper (mg/l)	*BDL
Chloride (mg/l)	323	Sodium Absorption Ratio	5.23
Carbonate (mg/l)	11	Residual Sodium Carbonate (meq/l)	-0.52
Bicarbonate (mg/l)	498	Bacteria (CFU/ml)	2
Calcium (mg/l)	101	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	48	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	181	Total Coli forms (MPN/100 ml)	11
Potassium (mg/l)	5	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Present
Nitrate N (mg/l)	0.28		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

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12/12/25

Associate Professor
Dept. of Env. Sciences

12/12/25

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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Nature of Sample : Water Sample No.3 - Piezometer 3
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.70	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	1.91	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	0.30	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	2.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	10	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	28	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1247	Total Fluoride (mg/l)	1.8
Total Suspended Solids (mg/l)	24	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	25.95	Total Copper (mg/l)	*BDL
Chloride (mg/l)	275	Sodium Absorption Ratio	5.25
Carbonate (mg/l)	27	Residual Sodium Carbonate (meq/l)	2.66
Bicarbonate (mg/l)	569	Bacteria (CFU/ml)	1
Calcium (mg/l)	83	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	41	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	166	Total Coli forms (MPN/100 ml)	9
Potassium (mg/l)	32	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Present
Nitrate N (mg/l)	0.28		

***BDL-Below Detectable Limit**

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12/12/25

Associate Professor
Dept. of Env. Sciences

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL REPORT

Nature of Sample : Water Sample No.4 - Piezometer 4
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.40	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.10	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	1.50	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	12	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	28	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1364	Total Fluoride (mg/l)	2
Total Suspended Solids (mg/l)	32	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	33.45	Total Copper (mg/l)	*BDL
Chloride (mg/l)	310	Sodium Absorption Ratio	5.72
Carbonate (mg/l)	21	Residual Sodium Carbonate (meq/l)	0.22
Bicarbonate (mg/l)	587	Bacteria (CFU/ml)	2
Calcium (mg/l)	112	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	54	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	209	Total Coli forms (MPN/100 ml)	11
Potassium (mg/l)	20	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	0.28		

***BDL-Below Detectable Limit**

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- Its use for publicity, arbitration or as evidence in legal disputes is strictly forbidden.

12/12/15

Associate Professor
Dept. of Env. Sciences

2/12/15

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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Nature of Sample : Water Sample No.5 - Open well 1
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	8.20	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.41	Phosphate (mg/l)	0.88
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	2.50	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	2.00	Total Chromium (mg/l)	1.2
Biological Oxygen Demand (mg/l)	14	Total Nickel (mg/l)	1.0
Chemical Oxygen Demand (mg/l)	40	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1558	Total Fluoride (mg/l)	2
Total Suspended Solids (mg/l)	42	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	15.15	Total Copper (mg/l)	0.6
Chloride (mg/l)	412	Sodium Absorption Ratio	2.79
Carbonate (mg/l)	39	Residual Sodium Carbonate (meq/l)	-4.19
Bicarbonate (mg/l)	503	Bacteria (CFU/ml)	2
Calcium (mg/l)	158	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	70	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	119	Total Coli forms (MPN/100 ml)	28
Potassium (mg/l)	91	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	0.56	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

- The results indicate only the actual content of parameters requested by the stakeholders for the samples provided by them.
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- Its use for publicity, arbitration or as evidence in legal disputes is strictly forbidden.

12/12/25

Associate Professor
Dept. of Env. Sciences

12/12/25

Professor and Head
Dept. of Env. Sciences
Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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Nature of Sample : Water Sample No.6 - Open well 2
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.

Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.90	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.58	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	3.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	6	Total Nickel (mg/l)	0.05
Chemical Oxygen Demand (mg/l)	16	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1668	Total Fluoride (mg/l)	1.5
Total Suspended Solids (mg/l)	40	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	27.5	Total Copper (mg/l)	*BDL
Chloride (mg/l)	583	Sodium Absorption Ratio	6.75
Carbonate (mg/l)	24	Residual Sodium Carbonate (meq/l)	-1.88
Bicarbonate (mg/l)	552	Bacteria (CFU/ml)	1
Calcium (mg/l)	123	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	67	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	266	Total Coli forms (MPN/100 ml)	Nil
Potassium (mg/l)	*BDL	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

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Associate Professor
Dept. of Env. Sciences

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL REPORT

Nature of Sample : Water Sample No.7 - Open well 3
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	8.30	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.20	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	3.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	5	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	16	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1428	Total Fluoride (mg/l)	1.5
Total Suspended Solids (mg/l)	36	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	24.6	Total Copper (mg/l)	*BDL
Chloride (mg/l)	583	Sodium Absorption Ratio	6.09
Carbonate (mg/l)	36	Residual Sodium Carbonate (meq/l)	-2.45
Bicarbonate (mg/l)	363	Bacteria (CFU/ml)	1
Calcium (mg/l)	92	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	60	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	217	Total Coli forms (MPN/100 ml)	4
Potassium (mg/l)	*BDL	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

- The results indicate only the actual content of parameters requested by the stakeholders for the samples provided by them.
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Associate Professor
Dept. of Env. Sciences

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL ADVISORY UNIT

ANALYTICAL REPORT

Nature of Sample : Water Sample No.8 - Open well 4
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	8.40	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.67	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	3.00	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	5	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	24	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1736	Total Fluoride (mg/l)	1.8
Total Suspended Solids (mg/l)	45	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	32.55	Total Copper (mg/l)	*BDL
Chloride (mg/l)	564	Sodium Absorption Ratio	5.91
Carbonate (mg/l)	27	Residual Sodium Carbonate (meq/l)	-1.34
Bicarbonate (mg/l)	586	Bacteria (CFU/ml)	1
Calcium (mg/l)	112	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	75	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	234	Total Coli forms (MPN/100 ml)	Nil
Potassium (mg/l)	35	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

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Dept. of Env. Sciences

12/12/25
Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003.

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL ADVISORY UNIT

ANALYTICAL REPORT

Nature of Sample : Water Sample No.9 - Open well 5
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	7.40	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	2.77	Phosphate (mg/l)	1.05
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	1.60	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	2.5	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	8	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	36	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1801	Total Fluoride (mg/l)	2.2
Total Suspended Solids (mg/l)	42	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	30.2	Total Copper (mg/l)	*BDL
Chloride (mg/l)	489	Sodium Absorption Ratio	4.89
Carbonate (mg/l)	57	Residual Sodium Carbonate (meq/l)	-0.30
Bicarbonate (mg/l)	660	Bacteria (CFU/ml)	2
Calcium (mg/l)	132	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	77	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	203	Total Coli forms (MPN/100 ml)	9
Potassium (mg/l)	118	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

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12/12/25

Associate Professor
Dept. of Env. Sciences

12/12/25

Professor and Head
Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore-641 003

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL ADVISORY UNIT

ANALYTICAL REPORT

Nature of Sample : Water Sample No.10 - Pond water
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Vaiues
pH	7.90	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	1.60	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	*BDL	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	3.0	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	5	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	24	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	1042	Total Fluoride (mg/l)	1.2
Total Suspended Solids (mg/l)	56	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	29.25	Total Copper (mg/l)	*BDL
Chloride (mg/l)	305	Sodium Absorption Ratio	4.85
Carbonate (mg/l)	12	Residual Sodium Carbonate (meq/l)	-1.30
Bicarbonate (mg/l)	314	Bacteria (CFU/ml)	2
Calcium (mg/l)	77	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	36	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	146	Total Coli forms (MPN/100 ml)	23
Potassium (mg/l)	*BDL	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	0.28		

***BDL-Below Detectable Limit**

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Dept. of Env. Sciences

Professor and Head
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Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

TAMIL NADU AGRICULTURAL UNIVERSITY
DEPARTMENT OF ENVIRONMENTAL SCIENCES
DIRECTORATE OF NATURAL RESOURCE MANAGEMENT
COIMBATORE - 641 003

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ANALYTICAL ADVISORY UNIT

ANALYTICAL REPORT

Nature of Sample : Water Sample No.11 - Bore water
Received from : Varalakshmi Starch Industries Private Limited., Varalakshmi Tower, 127/1, 2nd Floor, Gandhi Road, Salem - 636 007.
Parameters analyzed : As below

Result

Parameters	Values	Parameters	Values
pH	8.00	Nitrite N (mg/l)	*BDL
EC (dS m^{-1})	0.21	Phosphate (mg/l)	*BDL
Odour	Absence of Foul odour	Oil and Grease (mg/l)	*BDL
Colour	Colourless	Total Phenol (mg/l)	*BDL
Turbidity (NTU)	1.7	Total Lead (mg/l)	*BDL
Dissolved Oxygen (mg/l)	5.4	Total Chromium (mg/l)	*BDL
Biological Oxygen Demand (mg/l)	2	Total Nickel (mg/l)	*BDL
Chemical Oxygen Demand (mg/l)	12	Total Cadmium (mg/l)	*BDL
Total Dissolved Solids (mg/l)	136	Total Fluoride (mg/l)	0.5
Total Suspended Solids (mg/l)	16	Total Mercury (mg/l)	*BDL
Sulphate (mg/l)	*BDL	Total Copper (mg/l)	*BDL
Chloride (mg/l)	38	Sodium Absorption Ratio	3.45
Carbonate (mg/l)	*BDL	Residual Sodium Carbonate (meq/l)	-0.70
Bicarbonate (mg/l)	52	Bacteria (CFU/ml)	Nil
Calcium (mg/l)	16	Fungi (CFU/ml)	Nil
Magnesium (mg/l)	9	Actinomycetes (CFU/ml)	Nil
Sodium (mg/l)	*BDL	Total Coli forms (MPN/100 ml)	Nil
Potassium (mg/l)	*BDL	E. coli forms (MPN/100 ml)	Nil
Ammoniacal N (mg/l)	*BDL	Salmonella	Nil
Nitrate N (mg/l)	*BDL		

***BDL-Below Detectable Limit**

Note: The above results are communicated with the following conditions.

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Associate Professor
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12/12/25

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Dept. of Env. Sciences

Professor and Head
Department of Environmental Sciences
Tamil Nadu Agricultural University
Coimbatore - 641 003

Phone : 0422-6611252/6611452
Email : environment@tnau.ac.in

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Annexure No. 4

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By Speed Post

TAMIL NADU POLLUTION CONTROL BOARD

Proceeding No.: TNPCB / T2 / F.025102 / Directions / Water / 2022 , dt: 17.10.2022

Sub. TNPCB – Industries – M/s. Varalakshmi Starch Industries Pvt. Ltd, S.F. No. 75 pt, 77 pt, 78 pt, 168 pt of Pappireddipatti &121pt, 125pt,128 -132 pt, 138 pt of Alamelupuram Village, Pappireddipatti Taluk, Dharmapuri District – Directions issued under Section 33A of the Water (P&CP) Act, 1974 as amended – Regarding.

Ref.

1. Proceeding No.: TNPCB / T2 / F.025102 / DMP / OL / Directions / W / 2021, Dated: 18.04.2022
2. DEE's Letter No.: DEE / TNPCB / DMP / STARCH / OL / 2021, Dated: 24.05.2022
3. Board's Memo No.: T2 / TNPCB / F.025102 / DMP / OL / 2021, Dated: 17.06.2022
4. JCEE (M)'s Letter. No.: JCEE (M) / TNPCB / VLR / F.No.1510 / DMP-OL / 2022, Dated: 12.09.2022.

****

Whereas, direction was issued to the unit M/s. Varalakshmi Starch Industries Pvt. Ltd, S.F.No. 75 pt, 77 pt, 78 pt, 168 pt of Pappireddipatti &121pt, 125pt,128 -132 pt, 138 pt of Alamelupuram Village, Pappireddipatti Taluk, Dharmapuri District vide proceeding 1st cited to comply with certain conditions stipulated therein. Subsequently, the unit was inspected by the Officials of O/o. DEE, Dharmapuri on 23.05.2022 and observed that the unit has not complied with most of the conditions of the direction issued to the unit. In view of the above, DEE, Dharmapuri vide reference 2nd cited recommended to conduct a personal hearing with unit.

Whereas, the Board vide reference 3rd cited, requested the JCEE (M), Vellore to inspect the unit and give a personal hearing and send a detailed report. Based on the Board's instruction, the unit was inspected by the JCEE (M), Vellore along with the Officials of O/o. DEE, Dharmapuri on 04.08.2022 and observed that the unit has not complied with any of the conditions imposed in the direction issued to the unit.

Whereas, unit was requested by the JCEE(M) to attend the personal hearing in the O/o. JCEE(M), TNPCB, Vellore on 22.08.2022 with all relevant particulars. The Managing Director of the above unit attended the personal hearing on 22.08.2022 and during the personal hearing the DEE, Dharmapuri was also present. During the personal hearing, the unit was requested to furnish certain details including action plan with time schedule for revamping the existing ETP.

Whereas, in response to the personal hearing conducted with the unit by JCEE (M), Vellore, the unit has sent a reply vide letter 25.08.2022. From the same the JCEE (M) observed that,

1) The unit has not complied the most of the directions issued by the Board vide board's proceedings dt: 18.04.2022. The unit has not improved the existing ETP so far and the existing ETP will not serve the purpose of satisfying the treated effluent standards as prescribed by the Board.

2) The unit has to conduct detailed study by a reputed institution by Anna University, Chennai / IIT Chennai on water and waste water audit and adequacy of their existing and proposed effluent treatment plant systems.

3) The unit has not satisfied the treated effluent standards prescribed by the Board, as collected from November 2021 to June 2022. The main parameters TSS, BOD & COD are mostly exceeding the standards prescribed by the Board.

4) The unit has not taken any efforts to replace the Seemai Karuvelam and to plant the native species as suggested by the Agricultural Department till date.

In the view of the above, JCEE (M), Vellore, vide letter 3rd cited has recommended to direct the unit to furnish certain details immediately.

In the light of the above, the unit of M/s. Varalakshmi Starch Industries, Alamelupuram Village, Pappireddipatti Taluk, Dharmapuri District is issued with the following directions under Section 33A of Water (Prevention and Control of Pollution) Act, 1974.

1. The unit has to furnish an action plan with time schedule for revamping the existing ETP provided so as to satisfy the treated effluent standards as prescribed by the Board and remove the Seemai Karuvelam trees already planted by them and replacing the same by planting the native species as recommended by the Agriculture Department along with proposal for safe disposal of entire quantity of treated effluent within 15 days.
2. The unit shall ensure that the treated effluent is uniformly dispersed for green belt development without any stagnation and also shall not discharge any treated /untreated trade effluent in to nearby water bodies
3. The unit has to furnish the report on Water and Wastewater audit and groundwater quality study carried out by reputed Institution like Anna University, Chennai / IIT Chennai within three months.
4. The unit has to cover the area of the storage of wet Tapioca Thippi by providing a shed within 3 months.

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TAMIL NADU POLLUTION CONTROL BOARD

5. The unit has to provide proper storm water drain to restrain the rain water mixing with trade effluent generated from the process area within three months.

6. The unit shall provide compound wall around the green belt area and ETP area within nine months.

7. In order to ensure for the compliance of the above directions 1 to 6, the unit shall furnish a Bank Guarantee for Rs. 50 Lakhs with validity for two years within a week's to the TNPCB, Chennai. (Format enclosed)

Failing to comply with the above direction, further action will be initiated against the unit on merits in accordance with law without any prior intimation.

The receipt of this proceeding shall be acknowledged.

Enclosure: As above

17/10/22

For Chairperson

17/10/22

To

The Managing Director,
M/s. Varalakshmi Starch Industries Pvt. Ltd.,
Alamelupuram Village, Pappireddipatti Taluk,
Dharmapuri District
Pin: 636 905

Copy To

1. The Joint Chief Environmental Engineer (M),
   Tamil Nadu Pollution Control Board,
   Vellore Zone - JCEE (M) is requested to furnish quarterly report on the unit's operation.

2. The District Environmental Engineer,
   Tamil Nadu Pollution Control Board,
   Dharmapuri.
   - The DEE, Dharmapuri is requested to monitor the above unit closely. After getting the reply for the above directions and Bank Guarantee from the unit, the DEE shall examine the issue of renewal of consent for current year. Based on the performance of the ETP operations and compliance of the directions, further renewal shall be decided by DEE. Further, the DEE is requested to furnish monthly report on the unit's operation.

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TO BE TYPED IN Rs.100/- NON JUDICIAL STAMP PAPER

THIS DEED OF GUARANTEE made on the _____ day of _____ Two Thousand Twenty One by _____ of the one part in favour of Tamil Nadu Pollution Control Board (TNPCB) of other part.

WHEREAS M/s._____ running an industry at _____has approached the TNPCB for the purpose of _____ and TNPCB having agreed to consider the request of the industry of M/s. _____ under the terms and conditions put forth in the schedule enclosed hereunder.

AND WHEREAS in accordance with clause _____ of the conditions put forth in the schedule enclosed hereunder the industry M/s. _____ is desirous of furnishing a Bank Guarantee from _____ for the sum of Rs._____ towards security deposit valid for _____ months.

AND WHEREAS at the request of the industry holder the Bank has agreed to give its guarantee as hereinafter contained. Now this deed witnesses as follows:

We (Bank name and address is to be typed here) (Herein after referred to as the Bank) do hereby undertake to pay the Board an amount not exceeding Rs._____ (amount to be typed in figures & words) against any non-fulfillment of the conditions contained in the schedule, wholly or partly by the said industry M/s. (full address of the unit is to be type here) and we, (Bank name and address is to be typed here) do hereby undertake to pay the amount due payable under this guarantee without any demur, merely on demand from the Board stating that the amount claimed is due by non-fulfillment of the conditions in the schedule wholly or partly by the said industry. Any such demand made on the Bank shall be conclusive as regards the amount due payable by the Bank under this guarantee. However our liability under this guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said schedule and that it shall continue to be enforceable till all dues of the Board under the schedule have been fully performed and its claim satisfied or discharged or till the Tamil Nadu Pollution Control Board (Office / Department) certifies that the terms and conditions of the said schedule have been fully and properly carried out by the said industry and accordingly discharges the guarantee. Unless a demand or claim under the guarantee is made on us in writing on or before (date of expiry of bank guarantee to be typed here) we shall be discharged from all liability under this guarantee thereafter.

We (Bank name and address is to be typed here) further agree with the Board that the Board shall have full liberty without our concern and without affecting in any manner our obligation hereunder to every one of the terms and conditions of the said schedule or to the extent the time of performance by the said industry from time to time or to postpone for any time or from time to time any of the powers exercised by the Board against the said industry and forbear and enforce any of the terms and conditions relating to the said schedule and we shall not be relieved of our liability by reason of any such variation, or extension being granted to the said industry or for any forbearance, act or omission on the part of the Board or any indulgence by the Board.

We (Bank name and address is to be typed here) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Board in writing.

(Banker Signature with Seal)

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SCHEDULE TO THE BANK GUARANTEE NO.

M/s.

Name of the Industry which applied for the consent of the Board	Bank guarantee Rupees	Terms and conditions
(full address of the unit is to be typed here)	Rs.50 Lakhs.	1. The unit has to furnish an action plan with time schedule for revamping the existing ETP provided so as to satisfy the treated effluent standards as prescribed by the Board and remove the Seemai Karuvelam trees already planted by them and replacing the same by planting the native species as recommended by the Agriculture Department along with proposal for safe disposal of entire quantity of treated effluent within 15 days. 2. The unit shall ensure that the treated effluent is uniformly dispersed for green belt development without any stagnation and also shall not discharge any treated /untreated trade effluent in to near by water bodies 3. The unit has to furnish the report on Water and Wastewater audit and groundwater quality study carried out by reputed Institution like Anna University, Chennai / IIT Chennai within three months. 4. The unit has to cover the area of the storage of wet Tapioca Thippi by providing a shed within 3 months. 5. The unit has to provide proper storm water drain to restrain the rain water mixing with trade effluent generated from the process area within three months. 6. The unit shall provide compound wall around the green belt area and ETP area within nine months. 7. Any non compliance of the above mentioned conditions will lead to forfeit of the Bank Guarantee amount.

(Banker Seal with Signature)

(Banker Name and Code Number)

Annexure No. 5

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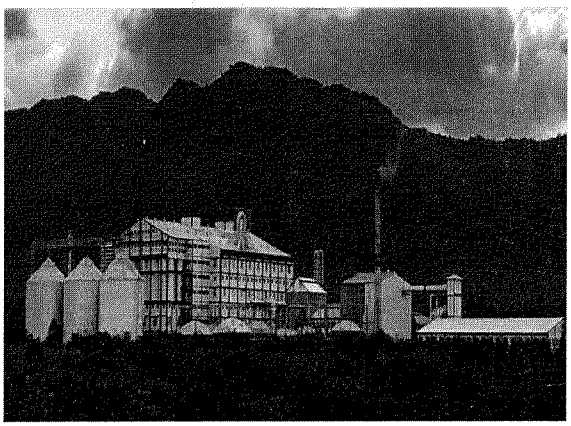
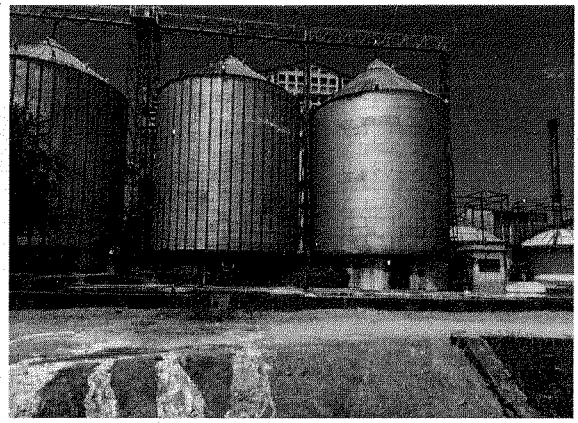
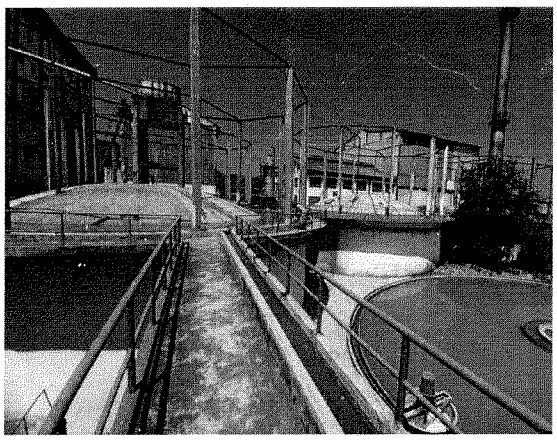
DESIGN ADEQUACY REPORT FOR EXISTING EFFLUENT TREATMENT PLANT

for

M/s. VARALAKSHMI STARCH INDUSTRIES PRIVATE LIMITED, DHARMAPURI


Prepared by

CENTRE FOR ENVIRONMENTAL STUDIES
DEPARTMENT OF CIVIL ENGINEERING
ANNA UNIVERSITY, CHENNAI - 600 025

MAY 2023

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CENTRE FOR ENVIRONMENTAL STUDIES
ANNA UNIVERSITY, CHENNAI - 600 025.

Off. : + 91-44-2235 4296 / 2235 3083
+91-44-2235 9009 / 9027 / 9010 / 9011
Fax : +91-44-2235 4717
Email : directorcesau@gmail.com
skanmani@annauniv.edu, skanmani@hotmail.com

Dr. S. KANMANI, B.E., M.E., Ph.D.
Professor & Director

Date: 29.05.2023

To
Mr. V. Anbalagan
Managing Director
Varalakshmi Starch Industries Pvt Ltd,
Varalakshmi Tower, 2nd floor,
No.127/1Gandhi Road,
Hasthampati (po),
Salem - 636007

Sir,

Sub: Consultancy work on "Design Adequacy for Existing Effluent Treatment Plant" in M/s. Varalakshmi Starch Industries Private Limited, Dharmapuri - Report sent – Reg.

*****

With reference to the above, I enclose 4 copies of the final Report on "Design Adequacy for Existing Effluent Treatment Plant" in M/s. Varalakshmi Starch Industries Private Limited, Dharmapuri. Kindly acknowledge the **Receipt** and issue the **Completion Certificate** for the consultancy work.

Thanking you,

Yours faithfully,

29/5/2023

DIRECTOR-CES

Dr. S. Kanmani, B.E.,M.E.,Ph.D
Professor & Director
Centre for Environmental Studies
Anna University, Chennai - 600 025

Encl: **Report - 4 Nos**.

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DESIGN ADEQUACY REPORT FOR EXISTING EFFLUENT TREATMENT PLANT IN M/s. VARALAKSHMI STARCH INDUSTRIES PRIVATE LIMITED

1.0 INTRODUCTION

M/s. Varalakshmi Starch Industries Private Limited is a composite, integrated and agro-based rural medium-scale industry located in Pappiredipatti of Dharmapuri district and engaged in the manufacture and export of BIS-ISI Certified Starch and Sago products at par with international standards using Tapioca Tuber and Maize Kernel and the largest producer of Tapioca Starch and Sago in India. The raw materials of Tapioca tuber (Cassava) and Maize are agricultural produce and are cultivated by small dry-land and tribal farmers predominantly in Tamil Nadu. The industry was set up in 1997 and has high-tech, automated, medium-scale operations in the fields of Tapioca and Maize. This industry has capacity to manufacture starches and modified starches at 6500 MT/month and sago and pappads at 5000 MT/month. The number of byproducts such as tapioca thippi, maize germ, maize gluten, and maize husk produced by the industry is 2000, 900, 675, and 1460 MT/month respectively.

The treatment capacity of the effluent treatment plant is 500 KLD. Since 2001, this industry has been running bio-methanation plants to treat industrial effluent as well as to generate biogas. The generated biogas is utilized for power generation as well as industrial heating, replacing furnace oil and coal. There are a total of six numbers of bio-methanation plants (Anaerobic Digesters – each 2,000 m^3 volume). This anaerobic digester is known as the Hybrid Upflow Sludge Medium Anaerobic Reactors (HUSMAR) process. This technology is provided by New Jersey Institute Technology, New York, USA. This industry is categorized as the "orange category" by TNPCB. The industrial effluent is treated organically to generate biogas and the treated wastewater is discharged into their own lands for irrigation. The findings of the CES team led by Dr. S. Kanmani, based on the data collected during the field visits on 24th February, 2023 and the interactions with ETP operational staff are presented in this report.

2.0 GEOGRAPHICAL LOCATION OF VARALAKSHMI STARCH INDUSTRIES (P) LTD

M/s. Varalakshmi Starch Industries Private Limited is situated in Pappireddipatti village, Dharmapuri district in Tamil Nadu. Geographical location of the industry is 11° 40' 18.12" N latitude and 78° 9' 18.396" E longitude of the earth's equator. Photograph of the Geographical location of industry is shown in Figure 1.

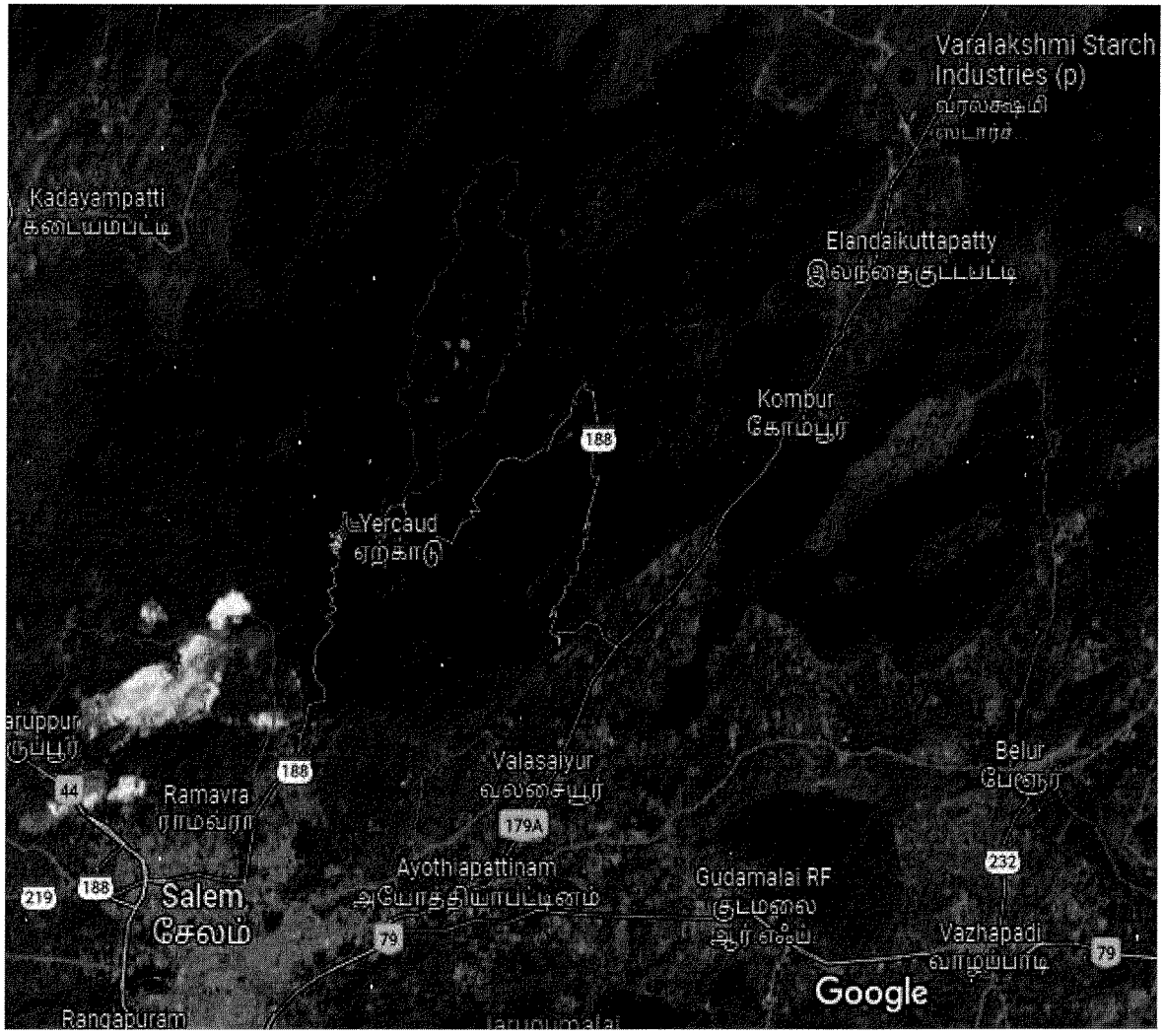

Figure 1 Aerial View of Varalakshmi Starch Industry (Source: Google)

2.1 MANUFACTURING PROCESS AT VARALAKSHMI STARCH INDUSTRY

2.1.1 MANUFACTURING PROCESS OF TAPIOCA STARCH

The manufacturing process flow diagram for Tapioca starch and sago is represented in Figure 2. The extraction of starch from tapioca is a process of separating starch granules from the tuber in their pure form. The granules are locked in cells together with other constituents of the protoplasm (proteins, soluble carbohydrates, fats, etc.,) and can only be removed by a purification process in the aqueous phase without any additives. The roots of tapioca should be processed within 48 hours after harvesting. The essential factor in the production of food grade tapioca starch is that the whole process, from harvesting the roots to completion of the final drying, should be carried out in the shortest time possible since deterioration sets in from the time of root extraction and proceeds throughout the process.

Fresh Tapioca Tuber Arrival & Dry Peeling (Cleaning)

Fresh tapioca tubers received at the factory are passed through a dry peeler, which removes the outermost skin and all soil particles adhering to the Tapioca tubers. This dry peeling and pre-cleaning not only improve the quality of the end product but also reduce the consumption of water in the washing process, thereby reducing the load on ETP to a large extent (Sand and Mud 95% removed).

Wet Washing of Tubers

The pre-cleaned tapioca tubers are peeled and washed in an automatic washer using clarified water obtained from the Decanter.

Chopping & Rasping

Washed tapioca tubers are fed into a chopper and chopped into small bits. This initial chopping reduces the load on the raspers as well as now the water requirement in the rasping process, as the Tapioca tubers are fed into the raspers for rasping in a disintegrated form, requiring less water for crushing.

The finely chopped tapioca tubers are fed into raspers, where they are crushed into a fine slurry. The SO_2 solution (not more than 80 ppm) is added through the column to prevent bacterial growth. The raspers used in the process employ modern technology using serrated, high-tensile

rasper blades. By using this method, the requirement for water is brought down considerably, as the rasper blades used here can crush the tapioca tubers into fine slurry with less water. The raspers are so designed that they can crush the tapioca tubers into micro particles, so that the Tapioca starch recovery will be high. The water usage will also be low, so the load on the decanters at the next stage of manufacturing will be reduced.

Decanting

The Fine slurry from the raspers is then fed into the high speed Centrifugal Decanters for removal of the impure fruit water from the fine slurry. This fruit water is then used as process water in the earlier stage for washing of the Tapioca tubers. This stage is introduced in the manufacturing process to reduce the washing load on the subsequent washing stage thereby leading to reduction of water consumption.

Extraction

Finely decanted tapioca slurry is passed through pulp extractors where the pulp (Thippi) is extracted from the tapioca slurry by adopting centrifugal separation method. The pulp separated here is passed through belt press where most of the remaining water from the tapioca pulp (Thippi) is removed. The tapioca pulp which comes out of the belt press is of semi solid consistency with 50-55% water.

Multistage Hydrocyclone washing

The tapioca starch milk obtained in the previous section is passed through separators which remove the 50% process water from the starch milk employing centrifugal principle. Tapioca starch milk coming out of these multistage hydrocyclone is further refined and concentrated in multi-stage hydrocyclones. In this stage, the entire impurity is removed and 70% water and 30% starch is obtained.

Centrifugal Separator

The fibre removed slurry have 5-8% matured starch, 0.1-0.2% partially matured starch and 92-94% water. The centrifugal separator removes around 50-60% process water which used for raw tapioca rasping and chopping.

Dehydrating

The concentrated tapioca starch milk is passed through centrifugal de-hydrators where water from the tapioca starch is removed by centrifugal method. The resultant wet tapioca starch will be in small lumps with about 35-40% moisture. The process water removed from the tapioca starch by de-hydrators is passed to Separators inlet (Step VI) to recover escaped tapioca starch particles.

Starch drying & Sieving

The lumps of wet tapioca starch obtained from the dehydrators are passed through a disintegrator to convert them into fine Tapioca starch powder. The powdery wet tapioca starch from the disintegrators is fed into flash dryers and dry the tapioca starch automatically using hot air generated from a hot air furnace, which is used to reduce the moisture in the finished tapioca starch to about 10%–12%.

Drying & Packing

The dried native tapioca starch powders obtained from the flash dryers is passed through feeder and sifters and gets bagged.

2.1.2 MANUFACTURING PROCESS OF TAPIOCA SAGO

The concentrated tapioca starch milk obtained in the Tapioca Starch manufacturing process is diverted for manufacturing of Tapioca Sago as follows.

De-hydrating

The concentrated tapioca starch milk is passed through centrifugal de-hydrators and Rotary drum Vacuum filters where water from the tapioca starch milk is removed. The resultant wet tapioca starch will be in small lumps with about 40 % moisture.

Sago balls making

The wet tapioca starch lumps are then made into wet Sago in the form of globules / pearls and sieved for the desired size.

Roasting

The sieved sago is roasted/boiled at high temperature in Thermic fluid oil heated Roasters.

Drying

The Roasted/Boiled Sago is dried in dryer to reduce moisture content to about 10-12%. Then the dried Sago is disintegrated to break the lumps and separate the Sago pearls.

Sieving & Packing

After disintegration the sago is sieved to remove powder and un-sized sago and then the Sago is packed.

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The process flow diagram for the manufacture of Tapioca Starch and Tapioca Sago

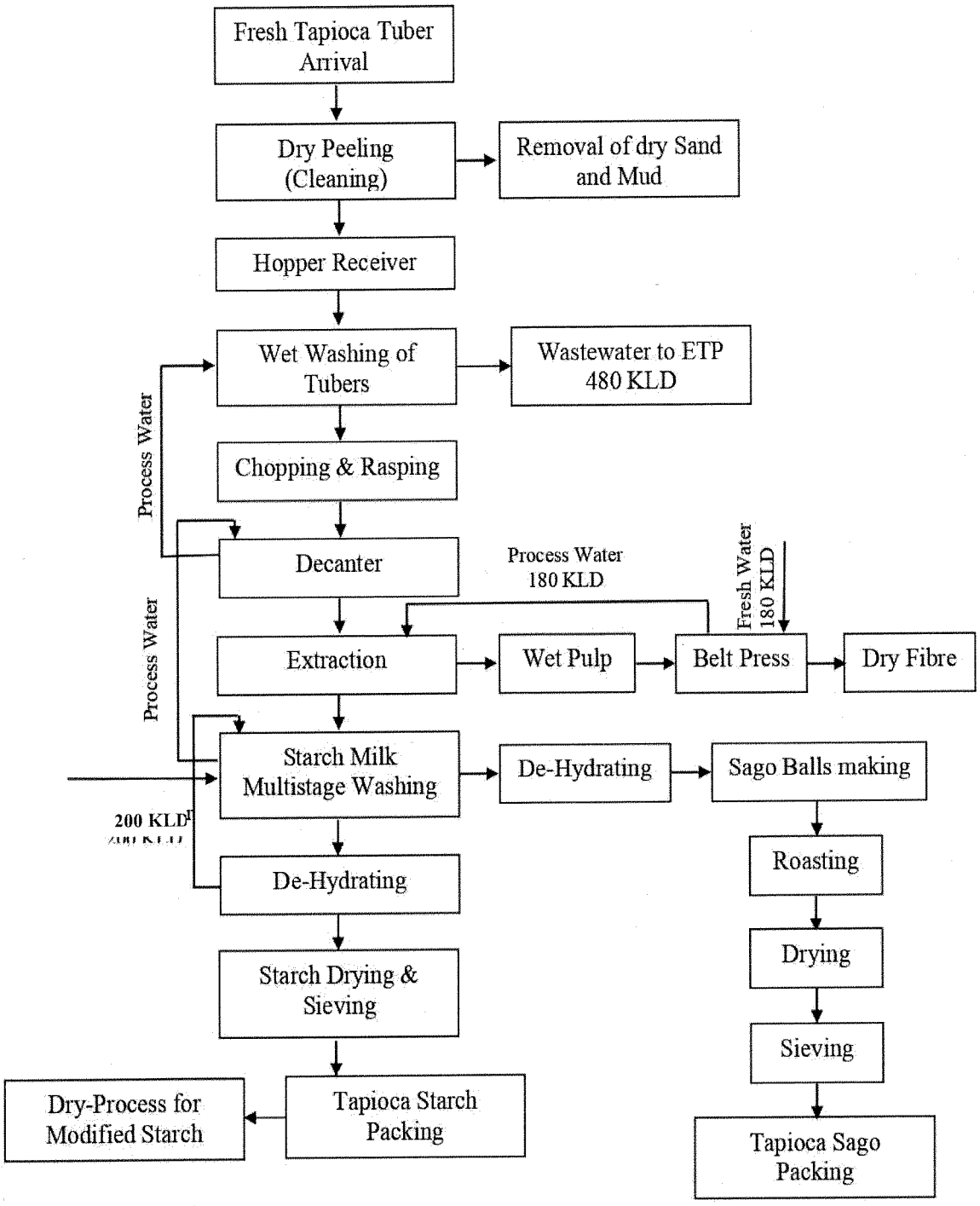

Figure 2 Manufacturing Process Flow Diagram of Tapioca starch and sago

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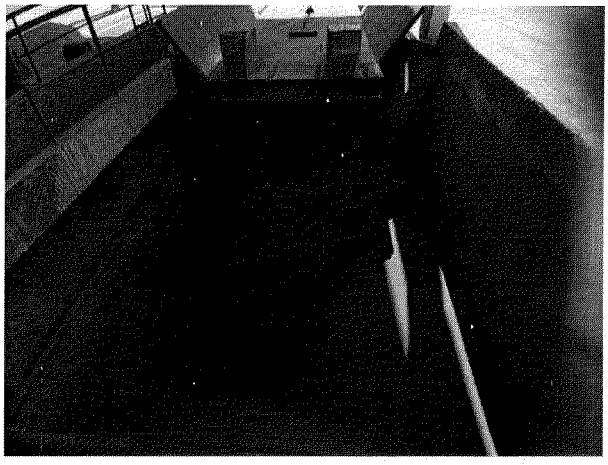
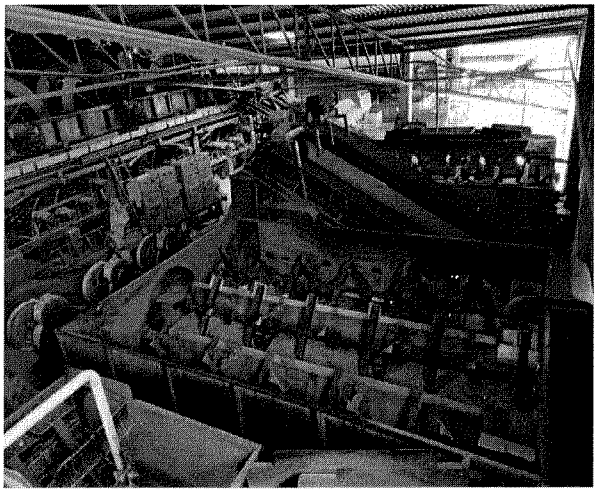
Tube Receiver



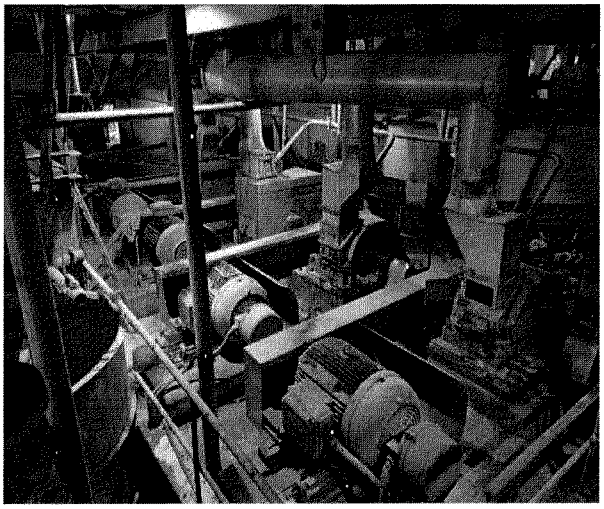
Dry Peeler

Hopper Receiver

Root Washer

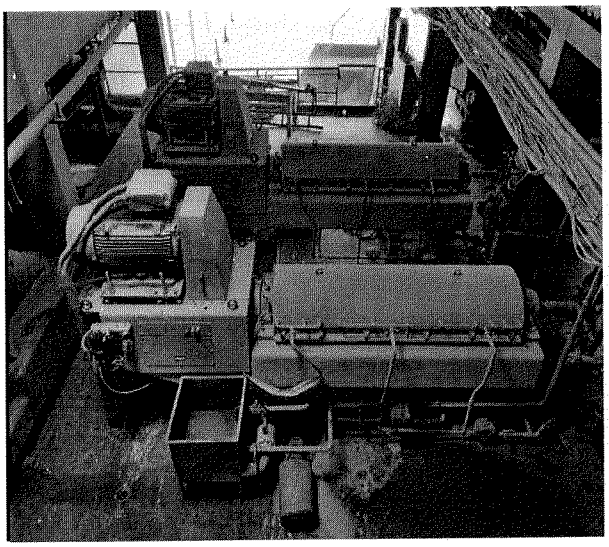


Receiver

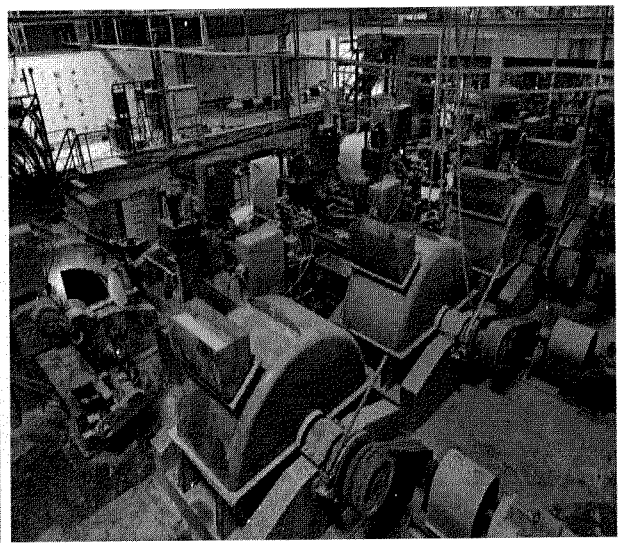


Separator

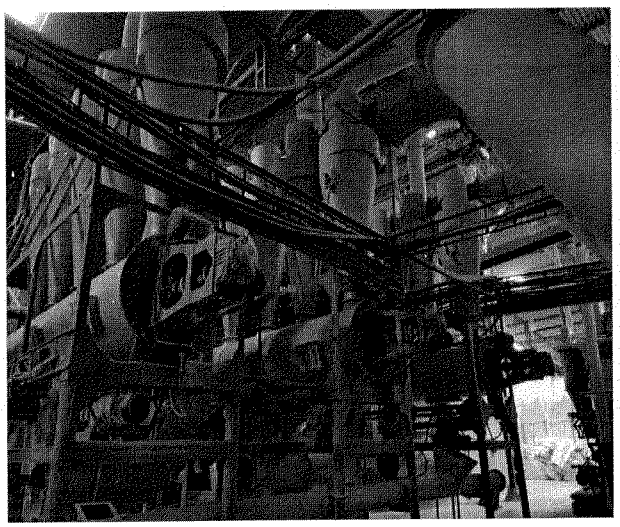
Decanter



Centrifuge



Dryer



Packing

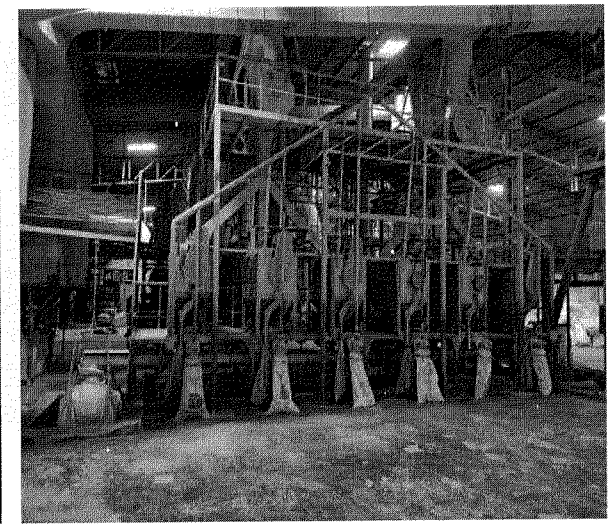


Figure 3 Manufacturing Process of Tapioca starch and sago

2.1.3 MANUFACTURING PROCESS OF MAIZE STARCH

The manufacturing process flow diagram of Maize starch is represented in Figure 4.

Unloading and Cleaning

Raw Maize received from farmers is unloaded and it is cleaned to remove solid impurities like cob, chaffs, sand and other undesirable foreign matter. The solid waste items and packing material are returned to the farmers and then cleaned maize is taken for process or stored into silos.

Maize Steeping

The cleaned maize is softened by steeping process by using recycled process water for duration of 40 to 60 hours at a temperature of 48 to 52 degree Celsius. In this process the maize absorbs water and become soft to enable easy separation of Germ. After steeping, the water from the steeping tanks is fed into biomethanation reactors to produce biogas and to reduce the BOD and COD in the effluent.

Pre-Milling and Germ Separation

The softened maize is subjected to coarse grinding/pre-milling where the maize is coarsely ground to release the germs without damaging them. As the germ is much light in density than the broken maize kernels, the germ is easily separated by using cyclones. The germ coming out of germ separating cyclones sent to dewatering section where the water from the germ is separated and sent back for steeping processing. The wet germ from the germ separation section is then dried in a germ drier and sold as a byproduct to Oil expellers for extraction of Corn Oil.

Fine Milling and Fiber Separation

The coarsely ground maize kernels free from germs are then ground through impact mill, finally to liberate maize slurry containing fiber, starch and gluten. The fiber is removed from the slurry by (Dutch State Mines) DSM Screens. The fiber thus removed is sent to fiber de-watering section where the free water from the wet fiber is removed and recycled into steeping processing. The fiber after reducing of water is either sold in wet condition or dried and sold as a byproduct for use as cattle feed.

Gluten Separation

The mixture of Gluten and Starch slurry free from fiber and germ is sent to primary Gluten Separator. Here the Gluten is of lower density than starch and so gluten slurry and starch slurry both

are separated. The gluten slurry separated in this section is sent to Gluten concentrator (Gluten Thickening Separator) and concentration section where the excess water is removed from the Gluten and the water recycled into steeping process. The concentrated Gluten cake from vacuum belt filter is sent to Gluten drying section where it is dried as a byproduct for poultry feed use.

Starch Slurry Washing and Dewatering

The starch milk after releasing the gluten is then thoroughly washed with the help of fresh water through 12 stage Hydro cyclones. After washing, the process water is removed from the starch milk and the water is recycled into milling section processing.

Starch Dewatering

The concentrated starch milk (Starch 40% and Water 60%) is passed through De-Hydrating Centrifuge for reducing moisture content upto 35% - 40%. The outlet water contains small portion of starch and it is recycled to starch slurry dewatering section.

Starch Drying

The wet starch /starch cake with 35-40% water obtained from dewatering section is then dried in flash drier by using hot air. The dry starch with 10-12% moisture obtained from the starch drier is sieved and then fine starch powder is packed and sold as finished product.

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The Process flow diagram for the manufacture of Maize Starch

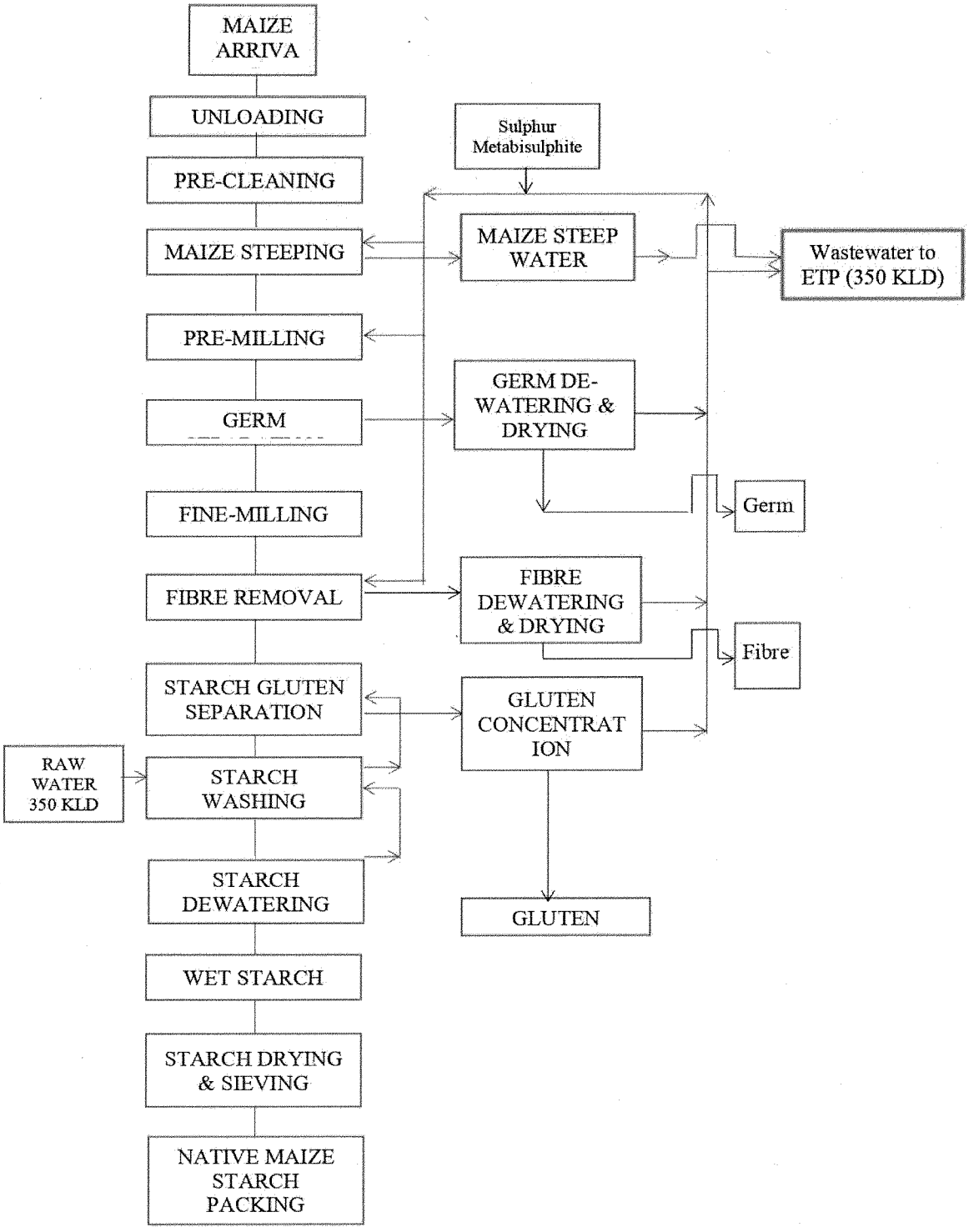

Figure 4 Manufacturing Process Flow Diagram of Maize starch

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3.0 VARALAKSHMI STARCH ETP –SCENARIO

3.1 ETP TREATMENT PROCESS DESCRIPTION-CURRENT STATUS

The existing and proposed tertiary treatment process flow diagram of ETP is presented in Figures 5 and 6. Effluent treatment plant (ETP) comprises of a four-stage process such as primary treatment, secondary treatment, tertiary treatment and sludge management. The existing systems are Collection tank, Overhead equalization tank, Hybrid Upward Flow Sludge Media Anaerobic Reactor (HUSMAR), Anaerobic lagoons, Diffused Aerators, Surface Aerators, Primary settling tanks, Clarifier, Filter press, Rotary vacuum filter and Sludge trying beds. The proposed systems are Diffused aeration tank, Settling tank and submerged MBR system. The ETP layout is presented in Figure 7. The ETP Treatment unit details are presented in Table 1.

Table 1 Treatment Units Details

S.No	Treatment Units	Nos.	Dimensions	Capacity
Existing System				
Primary Treatment				
1	Collection tank	1	3.4 m×1.2 m×1.6 m	500 m^3
2	Overhead Equalization tank	1	304 m×2.6 m×1.0 m	
3	Hybrid Upward Flow Sludge Media Anaerobic Reactor (HUSMAR)	6	15.0 m dia.×16.0 m ht. (each)	2000 m^3 (each)
Secondary Treatment				
4	Anaerobic lagoons	2	30.0 m×15.0 m×3.5 m (each)	
5	Diffused Aerators	4	10.0 m dia.×3.0 m ht. (each)	400 m^3(eac'
6	Surface Aerators	4	10.0 m dia.×3.0 m ht. (each)	400 m^3 (each)
7	Primary settling tanks	2	15.0 m×6.0 m×3.0 m (each)	
8	Clarifier	1	23.30 m dia.×4.2 m ht.	
Sludge Management				
9	Filter Press	2	5.25 m×0.98 m	
10	Rotary vacuum filter	1	2.50 m dia.×3.25 m length	
11	Sludge drying beds	5	10.18 m×15.24 m×1.10 m	
Proposed System				
Tertiary Treatment				
12	Diffused aeration tank	1	5.70 m×14.25m×4.40 m	
13	Settling tank	1	4.50 m×14.25m×4.40 m	
14	Submerged MBR System			
	MBR Tank	2	3.20 m×9.30 m×4.40 m	
	MBR Settling tank	2	3.20 m×4.50 m×4.40 m	
	MBR Permeate tank	2	3.20 m×4.50 m×4.40 m	

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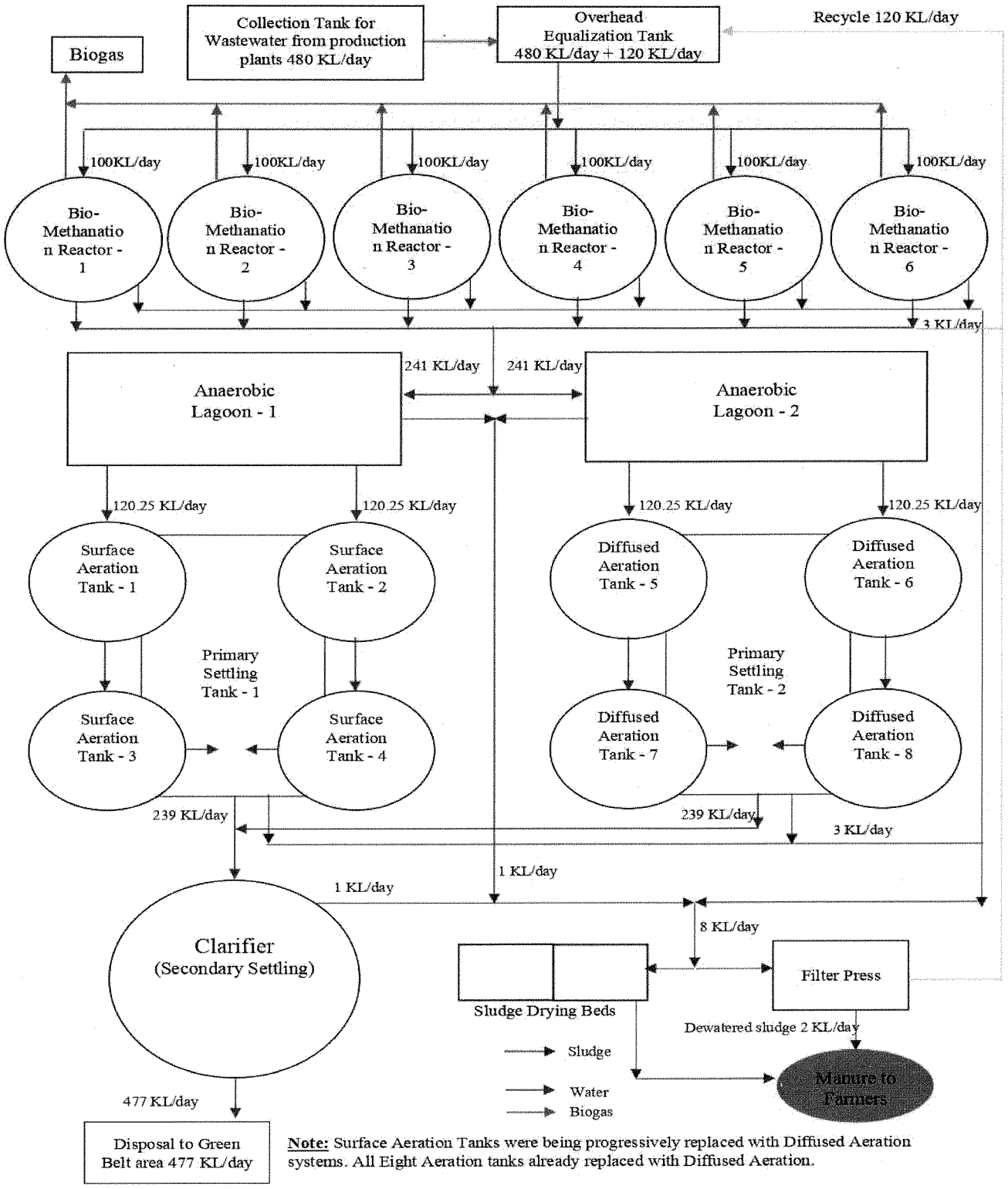

Figure 5 Treatment Process Flow diagram (Existing system)

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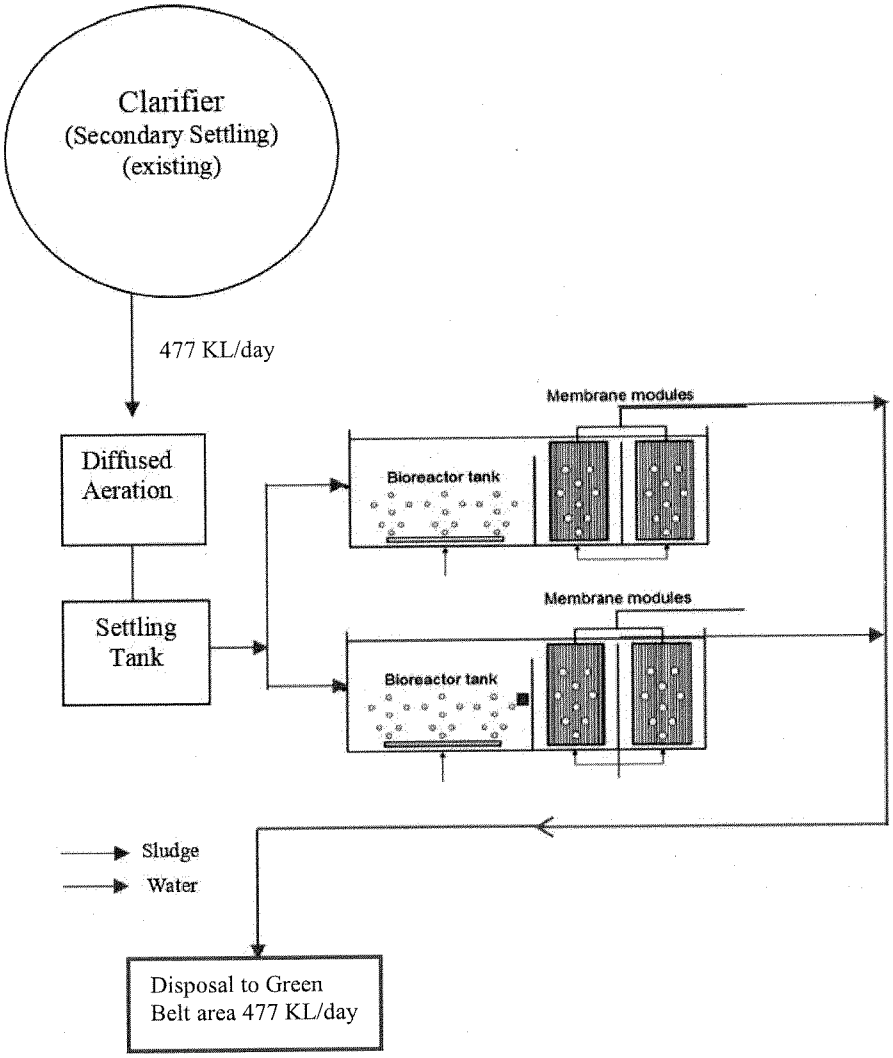

Figure 6 Tertiary Treatment Process Flow diagram (Proposed system)

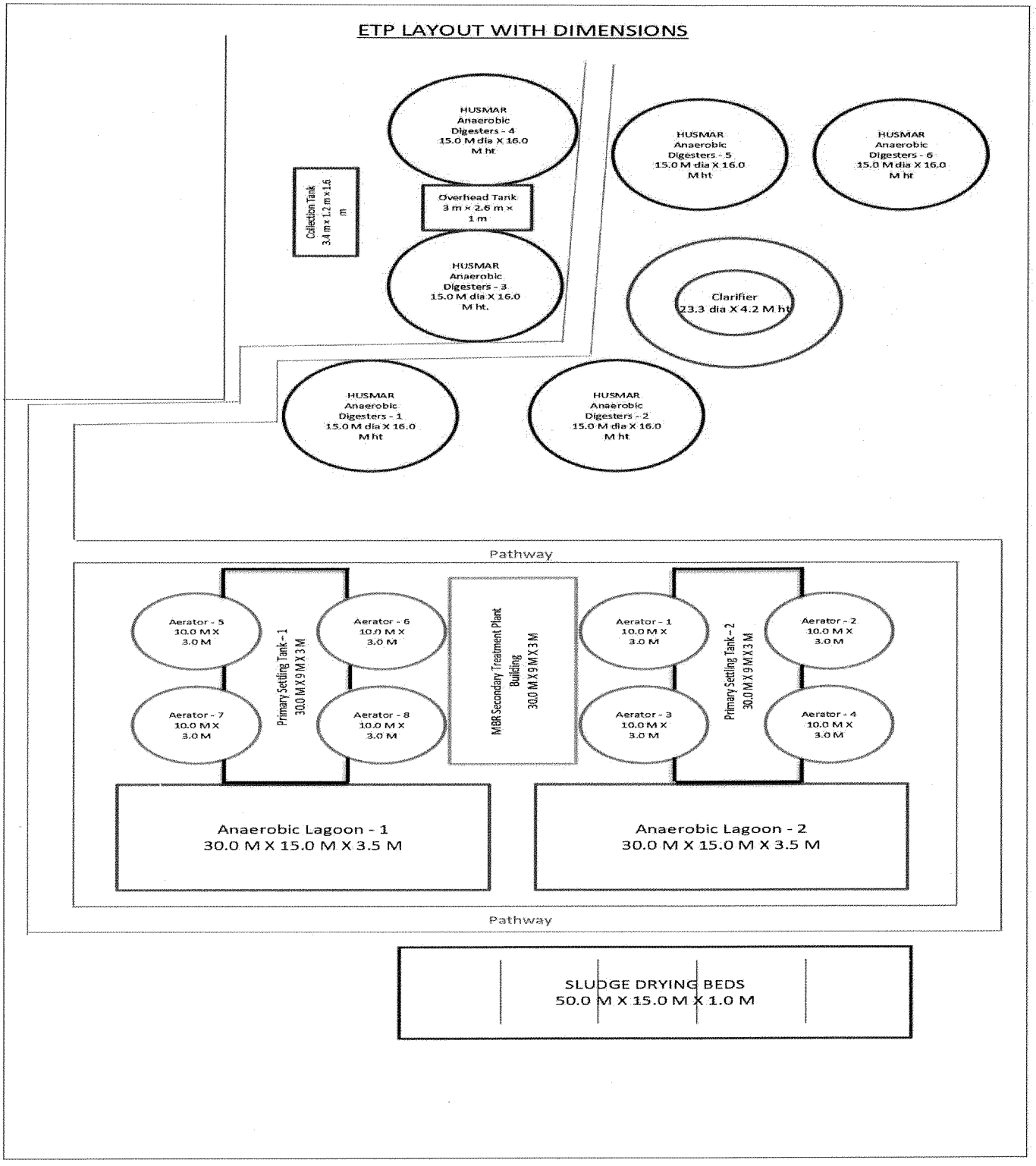

Figure 7 Plant layout

3.1.1 PRIMARY TREATMENT

High-Rate Bio-Methanation Plant

The effluent generated in the ETP from the processing of agricultural materials are organic and biodegradable where the effluent actually serves as a raw material for generation of highly valuable fuel namely Biogas which is used as a fuel for heat and power generation. Higher the reduction of COD and BOD in the effluent treatment process will lead to higher quantum of Biogas generation as use of Biogas leads to huge savings in operation of the industry through replacement of costly coal and power. Accordingly this industry is converting the wastewater into valuable byproduct as renewable energy.

Anaerobic Technology is best suited for treatment of wastewater containing organic matters. It is clean, environment friendly and highly efficient technology. It requires very low operating & maintenance costs, less land area and lesser power requirement for operation. In anaerobic treatment process, the wastewater is passed through a reactor where fermentation of organic matters takes place in the presence of acidogenic and methanogenic bacteria resulting in the formation of methane rich biogas as the end product. The biogas can be utilized for power generation due to its fairly higher energy content and thermal application depending upon the requirement. Anaerobic digestion is the step for wise conversion of large molecules of organic compounds into Methane and Carbon Dioxide by bacteria in the absence of free oxygen. This process is carried out in an airtight reactor. Wastewater introduced continuously or intermittently into the reactor is retained for varying periods of time. The stabilized wastewater is withdrawn continuously or intermittently from the reactor, which is reduced in organic and pathogen content and non-putrescible. The characteristics of the starch-processed wastewater were analyzed and anaerobic Treatment through High Rate Biomethanation Process was decided as the technically and economically viable method.

Hybrid Upward Flow Sludge Media Anaerobic Reactor (HUSMAR) Process

The HUSMAR Process is a combination of the UASB and the Upflow Fixed Film (UFF) reactors. This development is an improved evolution as it combines the strong process attributes of the UASB and Fixed Film Technologies System (extensive surface area for holding live bacteria) and minimizes the shortcomings of these systems. The HUSMAR is a cylindrical vessel. The lowermost 20-30 % of the volume is the UASB portion where a flocculent and / or granular sludge develops. Most of the organic stabilization occurs in this sludge bed. The uppermost 50 - 60 % of

the volume is the UFF section and remaining area of 20-30% for gas holder. Depending on the physical, chemical & biological properties of the effluent and the conditions of biochemical interactions prevailing in the HUSMAR, the gas composition is observed to vary. The Low heat content of gas is estimated to be about 5000 Kcal/m^3. Typical analysis of the gas composition generated from Tapioca starch and Maize starch effluents with HUSMAR is presented in the Table 2.

Table 2 Composition of Biogas from HUSMAR

S.No	Constituent Gas	Volumetric composition
1	Methane, CH_4	50-65%
2	Carbon-dioxide CO_2	34-49%
3	Hydrogen Sulphide H_2S	0.5-1%

A total of six numbers of Bio-Methanation Plants (Anaerobic Digesters - each 2,000 m^3 volume) serve dual purpose of treating the wastewater as well as to generate Biogas (waste to energy). These Digesters were put up in 3 phases, 2 digesters in the year 2002 as first of its kind Demonstration projects under United Nations Development Program (UNDP) and after being successful, 2 digesters in the year 2007 and the last 2 digesters in the year 2012 were further installed. In this stage itself, the BOD and COD are reduced and Biogas (50 – 65 % Methane) is generated and used for electric power generation and heat applications. The anaerobic digesters in primary treatment are presented in Figures 8 and 9.

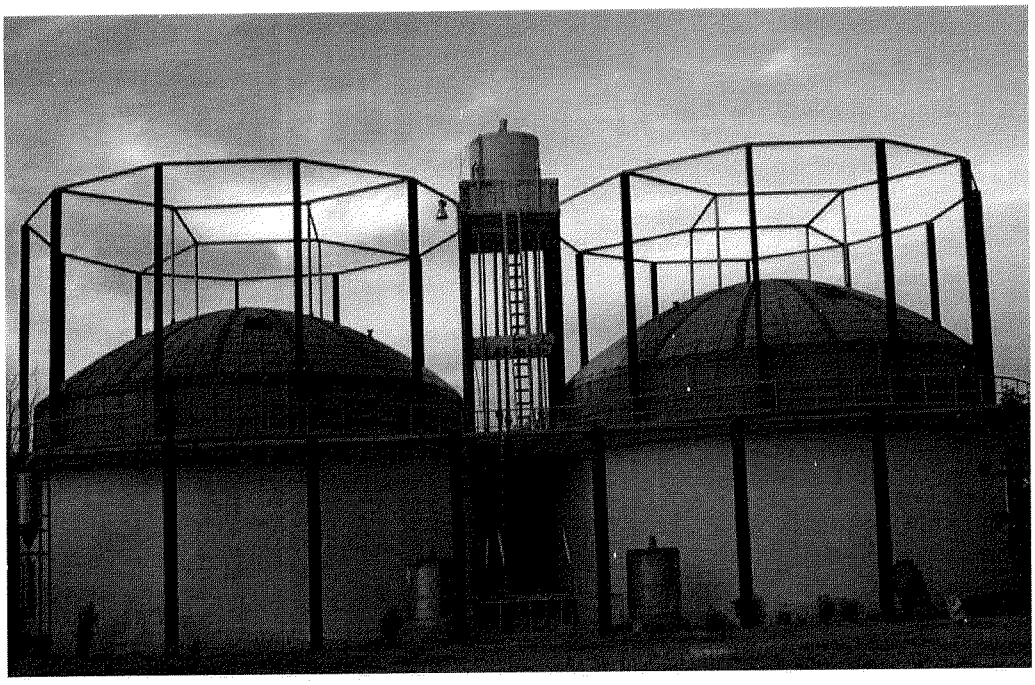

Figure 8 Anaerobic digester

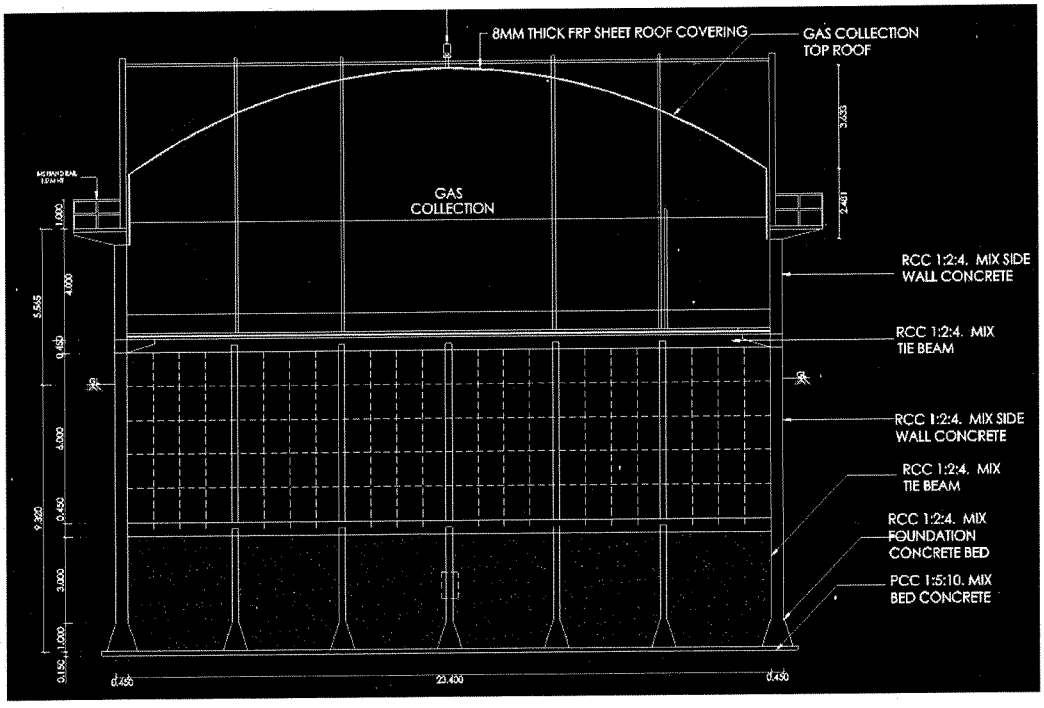

Figure 9 Anaerobic digester design

3.1.2 SECONDARY TREATMENT

Aeration and Clarification Process

After the primary treatment, the near wholly treated effluent is then subjected to Aerobic treatment in 4 nos. of Diffused aeration system and 4 nos. of surface aeration system each with a volumetric capacity of 400 m^3 and the sludge in the treated effluent is allowed to settle in Settling Tanks before it sent to the Clarifier. The alum is added in clarifier inlet to enhance the treatment performance. The aeration and settling tanks are represented in Figure 10.

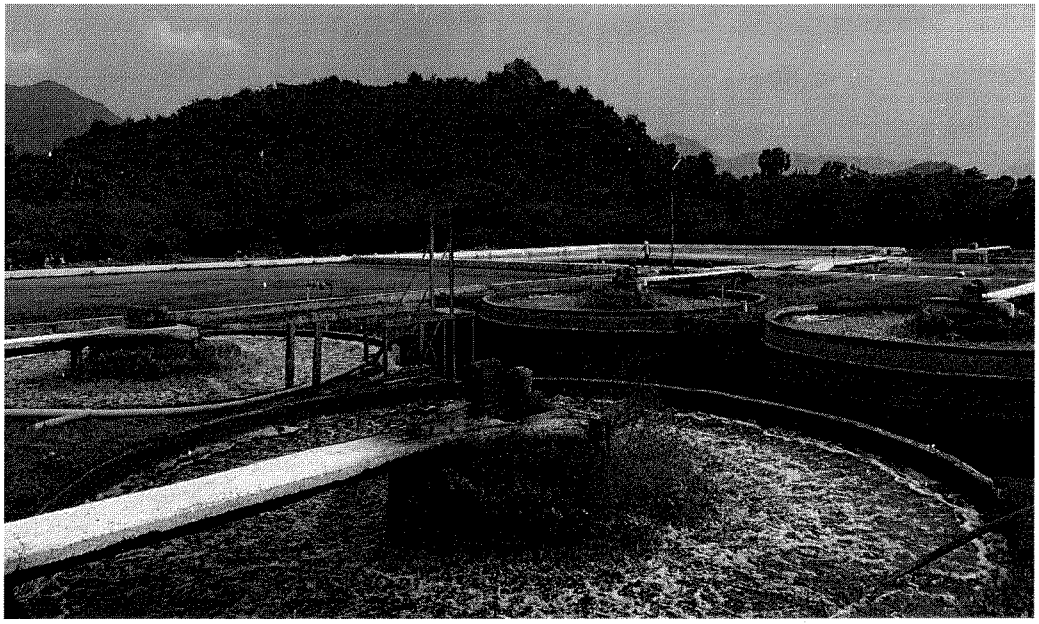

Figure 10 Aeration and Settling tanks

3.1.3 TERTIARY TREATMENT (PROPOSED)

Membrane Bioreactor Technology (MBR)

Membrane bioreactor (MBR) is a combination of membrane processes like microfiltration or ultrafiltration with a biological wastewater treatment process, the activated sludge process. In the submerged membrane bioreactor (SMBR), the membrane is located inside the biological reactor, submerged in the wastewater. MBR processes can produce effluent of high enough quality for discharge into the sea, oceans, or waterways for usage in urban irrigation. Two MBR configurations exist: internal/submerged, where the membranes are immersed in and integral to the biological

reactor; and external/side stream, where membranes are a separate unit process requiring an intermediate pumping step.

The submerged configuration adopted in the ETP. Here, the filtration element is installed in the main bioreactor vessel. The modules are positioned above the aeration system, fulfilling two functions, the supply of oxygen and the cleaning of the membranes. The membranes are tubular and incorporates an online backwash system which reduces membrane surface fouling by pumping membrane permeate back through the membrane. Immersed MBR has been the preferred configuration due to its low energy consumption level, high biodegradation efficiency, and low fouling rate compared to side stream membrane bioreactors. Due to the high number of microorganisms in MBRs, better degradation is achieved in comparison to the conventional process. The industry has expanded the ETP by installing the Membrane Bioreactor (MBR) technology to enhance the treatment efficiency and meet the standards for treated wastewater reuse. The proposed Membrane Bioreactor (MBR) module is presented in Figure 11.

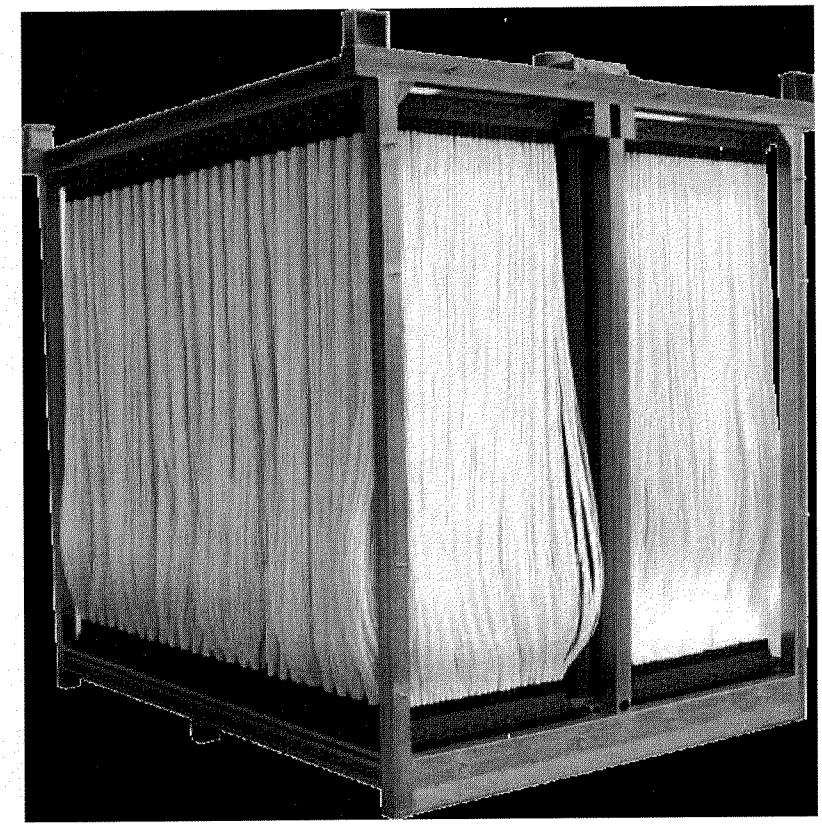

Figure 11 Membrane Bioreactor (MBR) Module

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Specifications of MBR

Membrane Specifications

Membrane Type	:	Gemini -U
Membrane Material	:	Reinforced PVDF (Poly vinylidine difluoride)
Membrane fiber ID/OD	:	ID:1.0mm /OD:2.0mm
Nominal Pore Size	:	0.02 µm
Membrane Type	:	Immersed
Membrane configuration	:	Hollow fiber outside -in
Max Extraction pressure	:	60 kPa
Max operation temperature	:	40°C
pH resistant range	:	1~13
Membrane area module	:	31m² each
Membrane module size (LxWxH)	:	2122x 721x 70 (mm) each

Cassette Specifications

Cassette Model	:	Gemini –U26
Module per cassette	:	26 Pcs x 6 nos
Membrane Area per cassette	:	806 m² x 6 = 4836 m²

MBR Design criteria

S.No	Parameter	Inlet	Outlet
1	pH	7 .0- 8.0	> 8.0
2	TSS	100 – 1000 mg/L	< 1 mg/L
3	BOD	100 – 300 mg/L	< 100 mg/L
4	COD	200 – 1000 mg/L	< 200

3.1.4 SLUDGE MANAGEMENT

Filter Press and Drying Beds

The Sludge is removed from the Anaerobic Digesters, Anaerobic lagoon and Settling Tanks. The sludge is dewatered in Rotary Drum Vacuum Filters / Filter Presses and then the dewatered wet sludge is dried in Sludge Drying Beds. The dried sludge is given to farmers supplying Tapioca to the unit as manure. The sludge drying beds is shown in Figure 12.

Figure 12 Sludge drying beds

4.0 STATUS AND OBSERVATION OF VARALAKSHMI STARCH ETP

The monitoring data of the ETP for the quality of effluents from different units of treatment plant was carried out on 24th February 2022 by CES team. The onsite measurement data of ETP is presented in Table 3. The collected ETP samples are presented in Figure 13. The field visit photos of treatment units in ETP are shown in Figure 14 (a-h). The parameters of the collected effluent samples analyzed by CES are presented in Table 4. In ETP, the color of the raw effluent was recorded as 2.63 m^{-1}, 2.99 m^{-1}, 3.51 m^{-1} at 436 nm, 526 nm and 620 nm respectively and the colour of treated effluent from clarifier was observed to be 2.21 m^{-1}, 3.14 m^{-1}, 4.36 m^{-1} at 436 nm, 526 nm and 620 nm respectively. The pH of the effluent was varied from 5.2 to 8.6 at the clarifier outlet.

The TDS of the raw effluent was found to be 12150 mg/L. After Anaerobic treatment, TDS was reduced to 4650 mg/L and reduced to 4450 mg/L in aerobic treatment. The TDS was decreased to 1650 mg/L in clarifier outlet, which are within the permissible limit given by TNPCB (TDS – 2100 mg/L). Total suspended Solids (TSS) present in the raw effluent was found to be 7200 mg/L and the TSS was reduced to 1100 mg/L in anaerobic treatment. After Aerobic treatment, the TSS was reduced to 550 mg/L and almost complete TSS reduction was achieved in clarifier which is within the permissible limit given by TNPCB (TSS – 100 mg/L).

The organic removal in terms of COD & BOD was analyzed and the obtained data demonstrated that the COD of the raw effluent was found to be 3516 mg/L. During the anaerobic treatment process, COD was reduced to 330 mg/L and the COD was reduced to 95 mg/L at clarifier tank. The BOD concentrations at collection tank and clarifier outlet were observed to be 3800 mg/L and 30 mg/L. From the results, the organics are within the permissible limit given by TNPCB (COD – 250 mg/L, BOD – 30 mg/L). From this, the organic removal was found to be 97.3% of COD and 99% of BOD.

The total hardness, calcium hardness and magnesium hardness of raw effluent were observed to be 1200 mg/L, 200 mg/L and 1000 mg/L respectively. The total hardness, calcium hardness and magnesium hardness of treated effluent were observed to be 370 mg/L, 60 mg/L and 310 mg/L respectively. The concentration of chlorides present in the raw effluent was observed as 253 mg/L and it was reduced to 160 mg/L, which is less than permissible limit (1000 mg/L). The concentration of the sulphates in the raw effluent found to be 546 mg/L and it was decreased to 54 mg/L, which is less than permissible limit (1000 mg/L).

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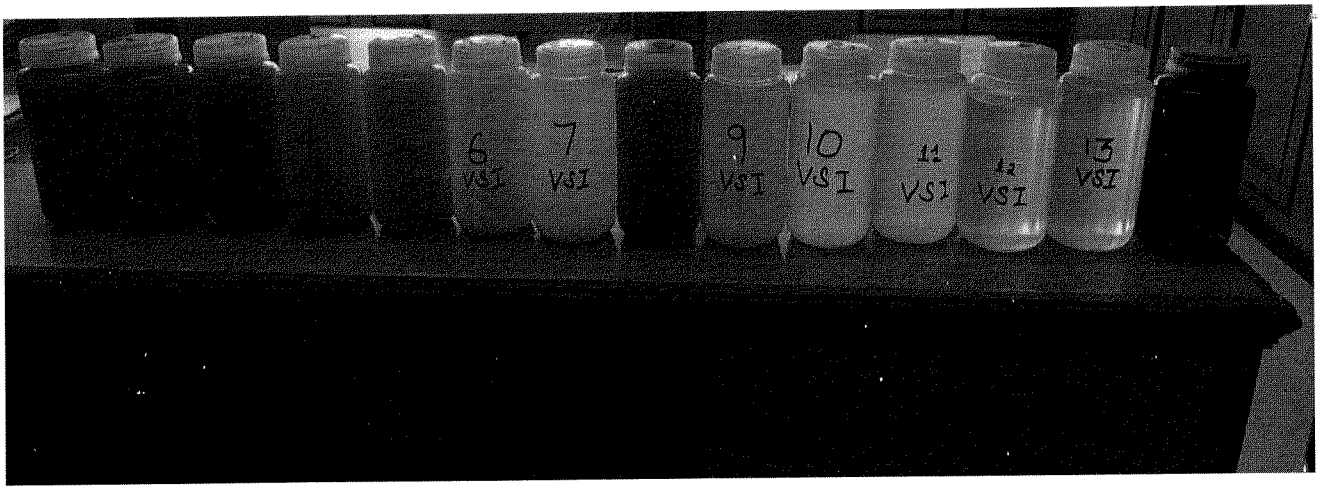
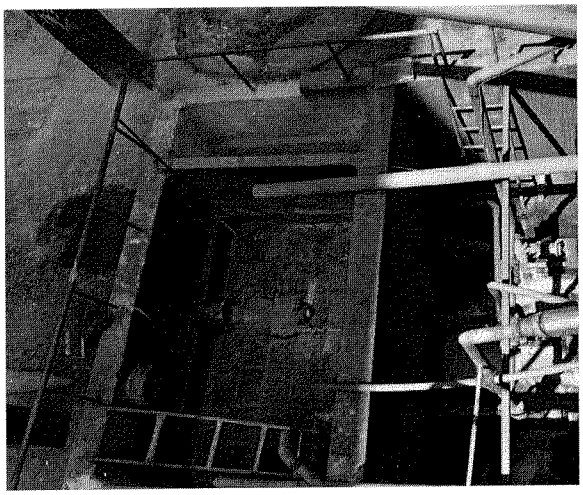
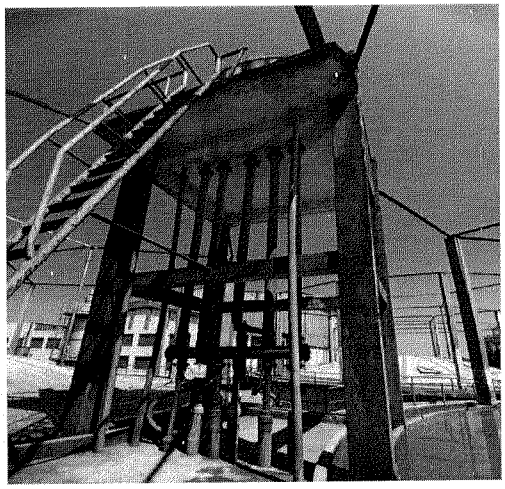


Figure 13 Samples collected from ETP on 24.02.2023

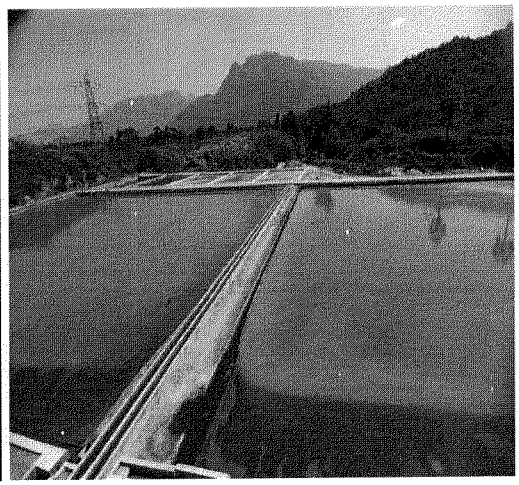


(a) Collection Tank

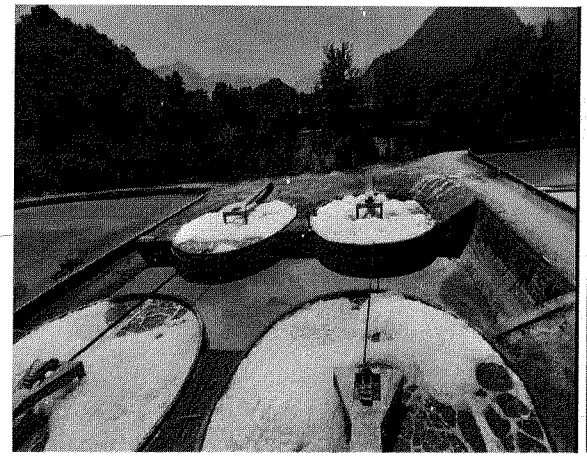


(b) Overhead Equalization Tank

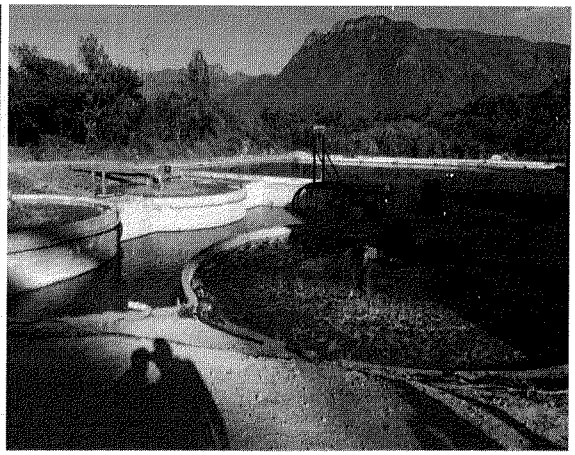
(c) Anaerobic Digester



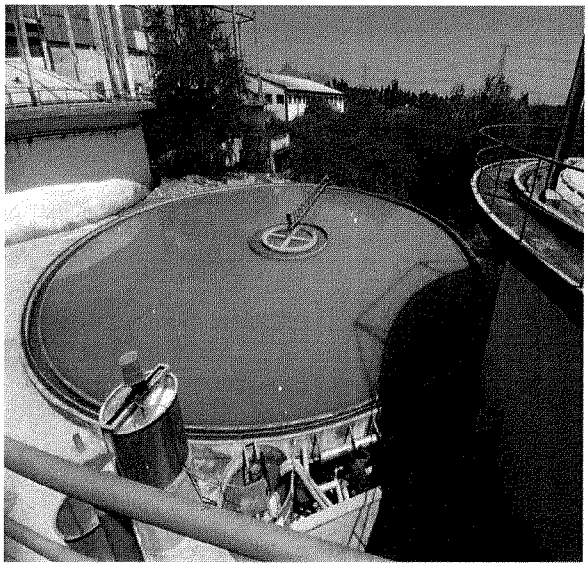
(d) Anaerobic lagoons



(e) Diffused Aeration tank

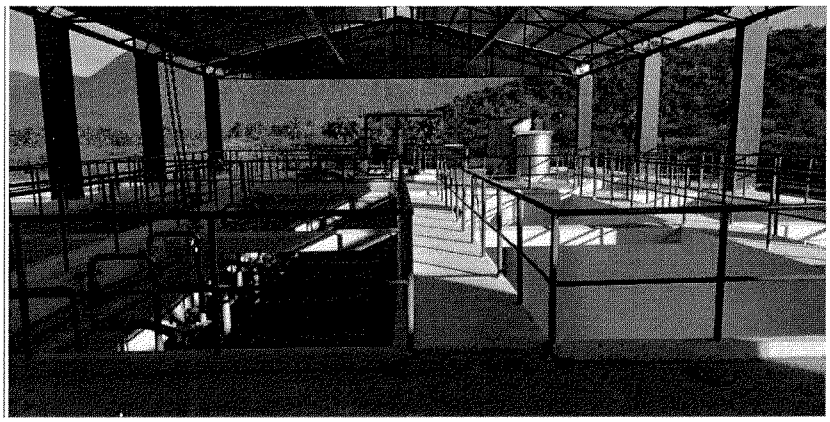


(f) Surface Aeration Tank



(g) Clarifier

(h) Treated effluent discharge area



(h) Proposed MBR System

Figure 14 (a-h) Treatment units of ETP on 24.02.2023

Table 3 Onsite Measurement Data for ETP Samples on 24.02.2023

Parameter	Hourly Measurement	1 Collection Tank	2 Equalization Tank	3 Anaerobic digester Outlet	4 Anaerobic lagoons 1 Outlet	5 Anaerobic lagoons 2 Outlet	6 Diffused Aeration Tank 1 Outlet	7 Diffused Aeration Tank 2 Outlet
pH	1	5.64		7.56	7.81	7.73	7.79	8.29
	2	6.37	6.37	7.63	7.82	7.81	7.94	8.47
	3	6.53		7.75	7.94	8.03	8.12	8.53
	COMPOSITE	6.50		7.40	8.29	8.33	8.48	8.76
EC (µS/cm)	1	3035		1200	1410	8015	4376	5376
	2	4437	4437	6609	6852	6430	5593	5593
	3	4307		5990	6430	6430	5553	5553
	COMPOSITE	4220		5887	6202	6202	5420	5420
TDS (mg/L)	1	1517		600	705	407	2188	2688
	2	2219	2219	3305	3426	3215	2797	2797
	3	2154		2995	3215	3215	2710	2777
	COMPOSITE	2110		2944	3101	2710	2710	2710

Table 3 Continued

Parameter	Hourly Measurement	8 Surface Aeration Tank Outlet	9 Primary settling Tank Outlet	10 Clarifier Outlet	11 Treated Water for Irrigation	12 Pond Water	13 Ground water	14 Sludge dewatering outlet
pH	1	8.27	8.15	8.49	8.56	8.72	8.31	8.39
	2	8.42	8.13	8.61				
	3	8.55	8.28	8.66				
	COMPOSITE	8.78	8.62	8.95				
EC (µS/cm)	1	5050	5376	2912	2753	899	375	5464
	2	5936	2218	3065				
	3	5050	1992	2455				
	COMPOSITE	5050	3210	2664				
TDS (mg/L)	1	2525	2688	1456	1377	450	188	2732
	2	2968	1109	1533				
	3	2525	996	1228				
	COMPOSITE	2525	1605	1332				

Table 4 Characteristics of ETP Samples on 24.02.2023

S.No	Parameters	Unit	1 Collection Tank	2 Equalization Tank	3 Anaerobic digester Outlet	4 Anaerobic lagoons 1 Outlet	5 Anaerobic lagoons 2 Outlet	6 Diffused Aeration Tank 1 Outlet	7 Diffused Aeration Tank 2 Outlet
1	pH		5.2	5.3	7.7	8.1	8	8.2	8.4
2	EC	µS/cm	2230	2150	2980	3060	3120	2690	2660
3	TS	mg/L	20000	18700	5800	5050	5750	6250	4600
4	TDS	mg/L	12150	11050	4650	4650	4000	4600	4450
5	TSS	mg/L	7200	7250	3650	1300	1100	600	550
6	BOD	mg/L	3800	3400	370	260	330	290	190
7	COD	mg/L	3516	2698	1697	1063	1022	1124	654
8	Color (436 nm)	m^{-1}	2.63	2.59	2.51	2.42	2.52	2.32	2.28
9	Color (526 nm)	m^{-1}	2.99	3.06	3.02	3.04	2.99	3.11	3.11
10	Color (620 nm)	m^{-1}	3.51	3.49	3.70	3.88	3.72	4.05	4.15
11	Total Hardness	mg/L	1200	1040	680	600	560	660	660
12	Calcium Hardness	mg/L	200	560	500	320	480	140	330
13	Magnesium Hardness	mg/L	1000	480	180	280	80	520	330
14	Chlorides	mg/L	253	337	295	270	312	278	262
15	Sulphates	mg/L	546	616	76	63	58	99	0
16	Silica	mg/L	1456	1676	1097	1206	897	1002	534
17	MLSS	mg/L	ND	ND	ND	ND	ND	800	ND
18	SVI	mL/g	ND	ND	ND	ND	ND	62.5	ND

Table 4 Continued

S.No	Parameters	Unit	8 Surface Aeration Tank Outlet	9 Primary settling Tank Outlet	10 Clarifier Outlet	11 Treated Water for Irrigation	12 Pond Water	13 Ground water	14 Sludge dewatering outlet
1	pH		8.5	8	8.6	8.4	8.6	7.6	8.2
2	EC	µS/cm	2620	1630	1050	988	427	190	2700
3	TS	mg/L	4750	3200	1850	1650	600	150	4750
4	TDS	mg/L	4400	2750	1650	1300	750	200	5450
5	TSS	mg/L	1600	250	0	100	0	0	1150
6	BOD	mg/L	240	160	30	54	48	9	180
7	COD	mg/L	818	593	95	172	0	4	981
8	Color (436 nm)	m^{-1}	2.41	2.31	2.21	2.89	0	2.33	2.33
9	Color (526 nm)	m^{-1}	3.06	3.08	3.14	3.08	0	3.18	3.11
10	Color (620 nm)	m^{-1}	3.87	4.12	4.36	4.19	0	3.89	4.02
11	Total Hardness	mg/L	540	370	320	320	230	20	540
12	Calcium Hardness	mg/L	520	60	110	80	90	10	500
13	Magnesium Hardness	mg/L	20	310	210	240	140	10	40
14	Chlorides	mg/L	287	186	160	152	110	46	270
15	Sulphates	mg/L	49	5	54	28	21	3	53
16	Silica	mg/L	800	563	636	522	317	146	1935
17	MLSS	mg/L	1400	ND	ND	ND	ND	ND	ND
18	SVI	mL/g	35.7	ND	ND	ND	ND	ND	ND

The primary and secondary sludge characteristics are presented in Table 5. The pH and EC of sludge were observed to be 7.9 and 23800 µS/cm respectively. The TSS and TDS of sludge were observed to be 280 mg/g and mg/g respectively. The moisture content of sludge was observed to be 91.65%. The Chlorides, sulphates and soluble silica of sludge were observed to be 253 mg/g, 80 mg/g and 146 mg/g respectively.

Table 5 Characteristics of Sludge on 24.03.2023

S.No	Parameters	Units	Value
1	pH		7.9
2	EC	µS/cm	23800
3	TSS	mg/g	280
4	TDS	mg/g	4833
5	Moisture content	%	91.65
6	Chlorides	mg/g	253
7	Sulphates	mg/g	80
8	Soluble silica	mg/g	146

Table 6 Characteristics of ETP Samples during February 2021- September 2022

Parameters	February 2021		March 2021		November 2021	December 2021			February 2022	March 2022		
	Inlet	Outlet	Inlet	Outlet	Outlet	Inlet	Anaerobic reactor	Outlet	Outlet	Inlet	Anaerobic reactor	Outlet
pH	3.83	7.85	4.03	7.38	7.18	4.19	6.33	7.36	6.65	2.46	6.11	6.24
TSS (mg/L)	2000	260	392	220	156	2612	1340	884	124	1212	564	264
TDS (mg/L)	4868	1952	4128	2944	1072	7080	1032	2332	916	4156	4256	916
Chloride (mg/L)	325	160	250	130	120	400	230	220	75	500	550	105
Sulphate (mg/L)	209	24	211	31	28	17	105	15	5	34	62	7
BOD (mg/L)	2400	315	2500	75	66	2400	660	180	115	4000	525	144
COD (mg/L)	11040	960	19840	592	368	14560	4000	752	504	25200	3520	600

Parameters	May 2022			July 2022			August 2022				September 2022		
	Inlet	Anaerobic reactor	Outlet	Inlet	Anaerobic reactor	Outlet	Inlet	Anaerobic reactor	Aeration Outlet	Outlet	Inlet	Anaerobic reactor	Outlet
pH	3.76	6.14	6.48	4.88	7.45	7.24	4.60	7.52	7.82	7.80	4.53	7.55	7.64
TSS (mg/L)	2860	860	196	2652	1184	124	1200	140	800	32	2600	460	24
TDS (mg/L)	18576	3344	1192	1704	2372	824	1620	2448	2024	1672	628	2988	664
Chloride (mg/L)	7498	450	165	445	490	173	325	450	450	290	260	725	150
Sulphate (mg/L)	162	111	22	74	70	23	157	24	46	32	5	39	5
BOD (mg/L)	9300	225	70	5250	1800	115	3900	145	108	30	168	168	8.7
COD (mg/L)	36400	1520	256	19200	14800	496	12600	1504	912	224	1440	1440	72

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5.0 ELECTROMAGNETIC FLOW METER READINGS

The electromagnetic flow meter is used to measure the inlet and outlet flow of effluent in ETP. The electromagnetic flow meter for ETP inlet is shown in Figure 15. The flow meter reading was observed to be 195 m^3 in 24.02.2023.

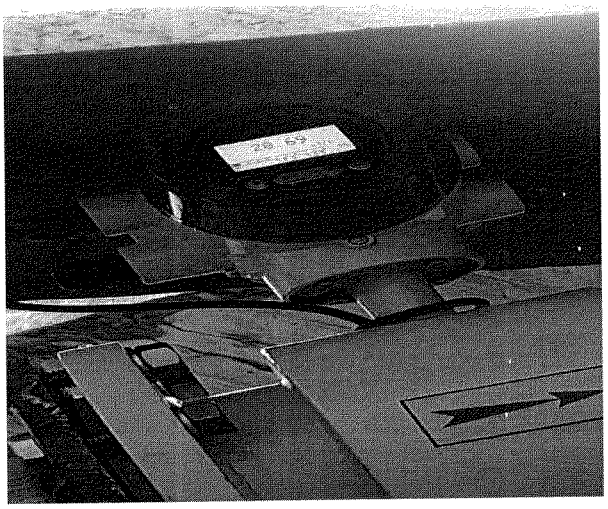

Figure 15 Electromagnetic flow meter in ETP inlet

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The flow meter readings data for January 2022 is presented in Table 7. From the table, the minimum and maximum flow was observed to be 80 m^3 and 480 m^3 respectively. Total flow was observed to be 12115 m^3 in ETP.

Table 7 Flow Meter Readings for January 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	5853	6328	475
2	6328	6808	480
3	6808	7283	475
4	7283	7723	440
5	7723	8168	445
6	8168	8630	462
7	8630	9095	465
8	9095	9563	468
9	9563	10028	465
10	10028	10498	470
11	10498	10968	470
12	10968	11436	468
13	11436	11901	465
14	11901	12366	465
15	12366	12366	0
16	12366	12366	0
17	12366	12446	80
18	12446	12446	0
19	12446	12546	100
20	12546	12834	288
21	12834	13304	470
22	13304	13769	465
23	13769	14237	468
24	14237	14702	465
25	14702	15167	465
26	15167	15637	470
27	15637	16107	470
28	16107	16572	465
29	16572	17034	462
30	17034	17502	468
31	17502	17968	466
		Total	**12115**

The flow meter readings data for February 2022 is presented in Table 8. From the table, the minimum and maximum flow were observed to be 380 m^3 and 474 m^3 respectively. Total flow was observed to be 12807 m^3 in ETP.

Table 8 Flow Meter Readings for February 2022

Days	Initial Reading in m^3	Final Reading in m^3	Inlet Flow in m^3
1	17968	18435	467
2	18435	18900	465
3	18900	19368	468
4	19368	19832	464
5	19832	20297	465
6	20297	20763	466
7	20763	21230	467
8	21230	21695	465
9	21695	22155	460
10	22155	22617	462
11	22617	23080	463
12	23080	23524	444
13	23524	23960	436
14	23960	24342	382
15	24342	24814	472
16	24814	25287	473
17	25287	25759	472
18	25759	26237	478
19	26237	26713	476
20	26713	27190	477
21	27190	27656	466
22	27656	28096	440
23	28096	28566	470
24	28566	29038	472
25	29038	29448	410
26	29448	29922	474
27	29922	30395	473
28	30395	30775	380
		Total	**12807**

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The flow meter readings data for March 2022 is presented in Table 9. From the table, the minimum and maximum flow were observed to be 110 m^3 and 477 m^3 respectively. Total flow was observed to be 9354 m^3 in ETP.

Table 9 Flow Meter Readings for March 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	30775	31135	360
2	31135	31517	383
3	31517	31748	231
4	31748	32015	267
5	32015	32485	470
6	32485	32885	400
7	32885	33175	290
8	33175	33652	477
9	33652	33959	307
10	33959	34279	320
11	34279	34549	270
12	34549	34795	246
13	34795	35104	309
14	35104	35304	200
15	35304	35544	240
16	35544	35979	435
17	35979	36309	330
18	36309	36639	330
19	36639	36804	165
20	36804	37046	242
21	37046	37386	340
22	37386	37706	320
23	37706	38176	470
24	38176	38641	465
25	38641	39101	460
26	39101	39431	330
27	39431	39621	190
28	39621	39756	135
29	39756	39866	110
30	39866	39997	131
31	39997	40128	131
		Total	**9354**

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The flow meter readings data for April 2022 is presented in Table 10. From the table, the minimum and maximum flow were observed to be 140 m^3 and 210 m^3 respectively. Total flow was observed to be 5218 m^3 in ETP.

Table 10 Flow Meter Readings for April 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	40128	40320	200
2	40320	40478	150
3	40478	40688	210
4	40688	40888	200
5	40888	41088	200
6	41088	41238	150
7	41238	41398	160
8	41398	41558	160
9	41558	41708	150
10	41708	41848	140
11	41848	42008	160
12	42008	42183	175
13	42183	42361	178
14	42361	42541	180
15	42541	42691	150
16	42691	42831	140
17	42831	42981	150
18	42981	43141	160
19	43141	43311	170
20	43311	43471	160
21	43471	43641	170
22	43641	43821	180
23	43821	43981	160
24	43981	44146	165
25	44146	44316	170
26	44316	44516	200
27	44516	44716	210
28	44716	44926	210
29	44926	45126	200
30	45126	45336	210
		Total	**5218**

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The flow meter readings data for May 2022 is presented in Table 11. From the table, the minimum and maximum flow were observed to be 35 m^3 and 285 m^3 respectively. Total flow was observed to be 3210 m^3 in ETP.

Table 11 Flow Meter Readings for May 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	45336	45336	0
2	45336	45536	200
3	45536	45737	201
4	45737	45772	35
5	45772	45964	192
6	45964	46149	285
7	46149	46184	35
8	46184	46351	167
9	46351	46386	35
10	46386	46561	175
11	46561	46671	110
12	46671	46808	137
13	46808	46943	135
14	46943	47108	165
15	47108	47143	35
16	47143	47178	35
17	47178	47208	30
18	47208	47248	40
19	47248	47288	40
20	47288	47324	36
21	47324	47364	40
22	47364	47400	36
23	47400	47435	35
24	47435	47475	40
25	47475	47671	196
26	47671	47720	49
27	47720	47773	53
28	47773	47978	205
29	47978	48034	56
30	48034	48247	207
31	48247	48556	205
		Total	**3210**

The flow meter readings data for June 2022 is presented in Table 12. From the table, the minimum and maximum flow were observed to be 45 m^3 and 215 m^3 respectively. Total flow was observed to be 3826 m^3 in ETP.

Table 12 Flow Meter Readings for June 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	48446	48616	170
2	48616	48768	152
3	48768	48918	150
4	48918	49129	211
5	49129	49274	145
6	49274	49444	170
7	49444	49489	45
8	49489	49649	160
9	49649	49824	175
10	49824	49870	46
11	49870	50072	202
12	50072	50247	175
13	50247	50412	165
14	50412	50557	145
15	50557	50692	135
16	50692	50872	180
17	50872	51077	215
18	51077	51232	145
19	51232	51387	155
20	51387	51552	165
21	51552	51704	152
22	51704	51876	172
23	51876	51976	100
24	51976	51976	0
25	51976	52081	105
26	52081	52081	0
27	52081	52081	0
28	52081	52187	106
29	52187	52187	0
30	52187	52272	85
		Total	**3826**

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The flow meter readings data for July 2022 is presented in Table 13. From the table, the minimum and maximum flow were observed to be 25 m^3 and 125 m^3 respectively. Total flow was observed to be 1018 m^3 in ETP.

Table 13 Flow Meter Readings for July 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	52272	52302	30
2	52302	52336	34
3	52336	52366	30
4	52366	52400	34
5	52400	52434	34
6	52434	52463	29
7	52463	52488	25
8	52488	52521	33
9	52521	52551	30
10	52551	52581	30
11	52581	52611	30
12	52611	52736	125
13	52736	52762	26
14	52762	52788	26
15	52788	52815	27
16	52815	52915	100
17	52915	52940	25
18	52940	53020	80
19	53020	53100	80
20	53100	53190	90
21	53190	53190	0
22	53190	53260	70
23	53260	53260	0
24	53260	53260	0
25	53260	53260	0
26	53260	53260	0
27	53260	53260	0
28	53260	53260	0
29	53260	53260	0
30	53260	53260	0
31	53260	53290	30
		Total	**1018**

The flow meter readings data for August 2022 is presented in Table 14. From the table, the minimum and maximum flow were observed to be 13 m^3 and 192 m^3 respectively. Total flow was observed to be 1315 m^3 in ETP.

Table 14 Flow Meter Readings for August 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	53290	53290	0
2	53290	53310	20
3	53310	53310	0
4	53310	53380	70
5	53380	53393	13
6	53393	53403	10
7	53403	53473	70
8	53473	53528	55
9	53528	53583	55
10	53583	53638	55
11	53638	53683	45
12	53683	53733	50
13	53733	53773	40
14	53773	53808	35
15	53808	53843	35
16	53843	53883	40
17	53883	53933	50
18	53933	53983	55
19	53983	54041	58
20	54041	54101	60
21	54101	54141	40
22	54141	54183	42
23	54183	54201	18
24	54201	54237	36
25	54237	54274	37
26	54274	54300	26
27	54300	54356	56
28	54356	54356	0
29	54356	54408	52
30	54408	54600	192
31	54600	54600	0
		Total	**1315**

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The flow meter readings data for September 2022 is presented in Table 15. From the table, the minimum and maximum flow were observed to be 3 m^3 and 192 m^3 respectively. Total flow was observed to be 2224 m^3 in ETP.

Table 15 Flow Meter Readings for September 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	54600	54740	140
2	54740	54897	157
3	54897	55072	175
4	55072	55264	192
5	55264	55412	148
6	55412	55604	192
7	55604	55761	157
8	55761	55936	175
9	55936	56119	183
10	56119	56285	166
11	56285	56442	157
12	56442	56547	105
13	56547	56552	0
14	56552	56555	5
15	56555	56555	3
16	56555	56555	0
17	56555	56555	0
18	56555	56555	0
19	56555	56555	0
20	56555	56571	16
21	56571	56606	35
22	56606	56636	30
23	56636	56651	15
24	56651	56683	32
25	56683	56683	0
26	56683	56718	35
27	56718	56745	27
28	56745	56775	30
29	56775	56788	13
30	56788	56824	36
		Total	**2224**

The flow meter readings data for October 2022 is presented in Table 16. From the table, the minimum and maximum flow were observed to be 16 m^3 and 192 m^3 respectively. Total flow was observed to be 732 m^3 in ETP.

Table 16 Flow Meter Readings for October 2022

Days	Initial Reading in m^3	Final Reading in m^3	Flow in m^3
1	56824	56854	30
2	56854	56854	0
3	56854	56870	16
4	56870	56902	32
5	56902	56902	0
6	56902	56932	20
7	56932	56957	25
8	56957	56957	0
9	56957	57149	192
10	57149	57306	157
11	57306	57481	175
12	57481	57566	85
13	57566	57566	0
14	57566	57566	0
15	57566	57566	0
16	57566	57566	0
17	57566	57566	0
18	57566	57566	0
19	57566	57566	0
20	57566	57566	0
21	57566	57566	0
22	57566	57566	0
23	57566	57566	0
24	57566	57566	0
25	57566	57566	0
26	57566	57566	0
27	57566	57566	0
28	57566	57566	0
29	57566	57566	0
30	57566	57566	0
31	57566	57566	0
		Total	**732**

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The power consumption data for ETP during January 2022 to October 2022 is presented in Table 17. From the table, the maximum power consumption was observed in February 2022 and the minimum power consumption was observed in June 2022.

Table 17 Monthly Power consumption data during January 2022 – October 2022

Days	January	February	March	April	May	June	July	August	September	October
	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW	Power consumed, kW
1	1617	1615	1575	795	0	170	751	0	772	731
2	1620	1614	1582	776	795	152	752	747	778	0
3	1617	1615	1526	800	795	150	751	0	785	726
4	1605	1614	1540	795	733	211	752	746	792	732
5	1606	1615	1618	795	792	145	752	724	775	0
6	1613	1614	1590	776	789	170	750	723	792	731
7	1615	1615	1548	779	733	45	749	746	778	729
8	1613	1614	1618	779	782	160	752	741	785	0
9	1615	1612	1555	776	733	175	751	741	788	792
10	1615	1612	1558	770	785	46	751	741	782	778
11	1616	1613	1540	779	761	202	751	736	778	785
12	1613	1603	1532	783	771	175	786	738	759	751
13	1620	1603	1557	785	770	165	749	735	0	0
14	1618	1583	1528	788	780	145	749	733	721	0
15	0	1617	1530	776	733	135	749	733	721	0
16	0	1616	1603	770	733	180	777	735	0	0
17	1470	1615	1560	776	731	215	749	739	0	0
18	0	1619	1560	779	735	145	770	740	0	0
19	1477	1618	1501	780	735	155	770	741	0	0
20	1548	1618	1530	779	733	165	773	742	726	0
21	1615	1614	1567	780	735	152	0	735	733	0
22	1613	1605	1560	788	733	172	766	736	731	0
23	1615	1618	1618	779	733	100	0	727	725	0
24	1614	1618	1614	772	735	0	0	734	732	0
25	1614	1593	1610	780	790	105	0	734	0	0
26	1618	1617	1560	795	738	0	0	730	733	0
27	1618	1618	1511	796	739	0	0	741	730	0
28	1614	1582	770	797	796	106	0	0	731	0
29	1614	1615	761	795	739	0	0	739	724	0
30	1615	1615	769	796	796	85	0	792	733	0
31	1615	1615	770	0	796	0	751	0	0	0
Total	**44863**	**49955**	**45261**	**23514**	**22749**	**3826**	**16651**	**19949**	**18104**	**6755**

6.0 GREEN BELT AREA

The total green belt area is 15.41 Hectares. The treated wastewater of 477 KLD is discharged in this green belt area. The soil types in the irrigated lands are Clay Soil and Gravel Soil and available plants are Seemai Karuvelam, Creepers and Grass. The layout of green belt is shown in Figure 16. The total green belt area utilized for treated effluent discharge is presented in Table 18. The green belt photos of Varalakshmi starch is presented in Figure 17.

Table 18 Utilization of land for Treated effluent discharge

Land for Greenbelt for disposing treated wastewater			
Village Name	**Patta No.**	**Survey No.**	**Extent in Hectares**
Pappiredipatty	206	75/2	0.95.00
Alamelupuram	18	125/1D	0.49.50
	18	125/2B	0.33.50
	18	125/3B	0.03.50
	18	128/2C	0.30.50
	18	128/5	0.14.50
	25	121/2A	1.26.50
	25	121/2B	0.76.00
	25	125/1A	2.44.00
	25	125/1C1	0.55.00
	25	125/1C2	0.07.00
	25	125/2A	0.16.50
	25	125/3A1	0.19.00
	25	125/3A2	0.04.00
	25	128/2A	0.84.00
	25	128/2B	0.36.00
	25	128/3A	0.13.50
	25	128/3B	0.14.00
	25	130/7	0.16.00
	37	128/1	0.50.00
	37	129/1	1.47.50
	37	129/2	0.68.50
	37	129/3	1.15.50
	37	130/1	0.32.00
	37	130/5	1.51.00
	37	130/6	0.11.50
		Total	**15.410**

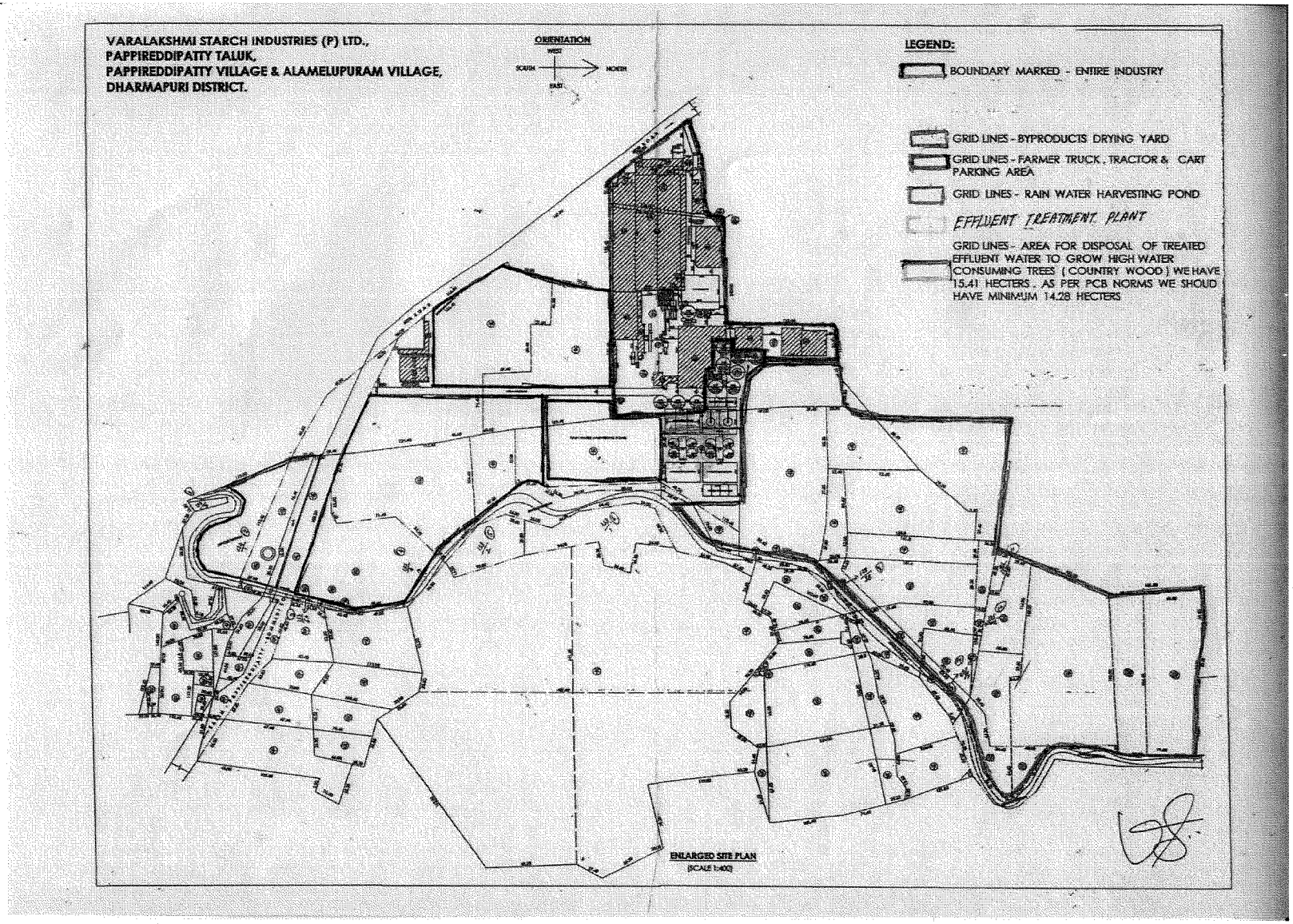

Figure 16 Green belt Area Layout

Figure 17 Green belt photos

7.0 SAFETY MEASURES

- PPE's such as Safety Boots, Safety Goggles, Rubber Gloves, Clothing, Safety Belts, First Aid Box, Fire extinguishers and Protective masks are provided to Personnel working in the ETP.
- The wastewater generated is 100% organic and biodegradable and non-hazardous.
- Therefore the needs for special safety measures are not required.

8.0 SUMMARY

M/s Varalakshmi Starch Industries Pvt Ltd. has requested the Centre for Environmental studies, Anna University, Chennai to carry out a design adequacy report for existing Effluent Treatment Plant on 19th September 2022. Varalakshmi Starch Effluent treatment plant has the capacity of 500 KLD for treating effluent from the manufacturing process of Tapioca starch, sago and maize starch. The water sources for starch production process are rainwater harvesting pond, wells and borewells. Varalakshmi Starch ETP proposed a MBR system for efficient solids and organic removal. By adopting this technique, the quality of treated effluent is expected to be meeting the reuse purposes. The overall performance analysis of ETP effluent shows that there is 100% colour removal. TDS concentration of effluent was reduced from 12150 mg/L to 1650 mg/L. TSS was found to be 7200 mg/L in the raw effluent and the almost complete TSS reduction achieved in clarifier. During the treatment process, COD of the raw effluent was reduced from 3516 mg/L to 95 mg/L at clarifier outlet and BOD concentration of raw effluent was reduced from 3800 mg/L to 30 mg/L at treated effluent. From the analysis results, the BOD and COD removal efficiencies were found to be 99% and 97.3% in the Effluent treatment plant.

Varalakshmi Starch industry used the Bio-methanation plants to treat the industrial effluent as well as to generate Biogas which is utilised for Power generation as well as for industrial heating replacing Furnace Oil and Coal. Biogas generation and Fresh water consumption records are not maintained by the industry. The industrial effluent is treated with anaerobic digestors to generate Biogas and the treated wastewater of 477 KLD is discharged in their own irrigated greenbelt lands of 15.41 Hectares. The land application of treated effluent is 30.7 m^3/d/ha, which is within the limit of standards. Biogas is used for Thermal application in the Boiler and Thermic Fluid Heaters as a substitute for Coal as well used for Power generation by using Biogas fuelled Gensets. The generated sludge is disposed as manure to the Tapioca supplying farmers. The generation of byproduct (thippi) from tapioca starch manufacturing is dried in the sunlight and stored in bags. And the stored thippi is supplied for cattle feed manufacturing. Based on process design furnished and analysis results, the effluent treatment plant with 500 KLD capacity proposed with MBR technology is expected to meet the discharge and reuse standards.

8.1 CONCLUSION

The performance study of the existing ETP in Varalakshmi Starch was evaluated by the CES Team based on field visit on 24th February 2023, and also CES team monitored and reviewed records maintained by the industry. The industry itself is regularly monitoring the performance of all the treatment units. The discharge of treated effluent into the land is found to be within the discharge limits. It may be concluded that all the treatment units as envisaged in the process flow diagram was implemented in the ETP except MBR system. The following observations were made during the period of field visit.

- The MBR system is not commissioned in the Varalakshmi starch ETP.
- After secondary treatment, the treated wastewater is directly discharged into the irrigation land.
- The chemical and biological sludge are not properly separated and treated.
- The quantity of sludge generation records is not maintained by the industry.
- The biogas generation, consumption and power generation data are not maintained by the industry.
- The flow meter is only installed in the inlet of Effluent treatment plant.
- The piezometric wells are not provided by the industry for ground water monitoring.
- The proper infrastructure facilities are not available in the industry for storage of byproducts.
- The hydraulic flow diagram is not available for the treatment systems.

Hence, it is concluded that Varalakshmi starch ETP industry is needed to commission the MBR treatment system for reusing of treated water to avoid contamination of surrounding environment. The industry is needed to provide proper infrastructure facilities for the storage and handling of by products. The industry is required to ensure appropriate safety systems and measures as proposed to avoid accidents and emergencies.

8.2 RECOMMENDATIONS

By observation of the Effluent Treatment Plant at Varalakshmi Starch, the CES is recommending the following inputs to be adopted by the industry.

- The industry is recommended to carry out the analysis of samples from all treatment units at regular intervals in order to study the performance of each operation and process.
- The presence of sulphur dioxide concentration in starch product shall monitor regularly before packing and ensure that it is within the limits of FSSAI standards.
- The industry is suggested to monitor the treated effluent parameters regularly and ensure that the all parameters are within the limit of discharge standards before which is discharged into the irrigation land.
- Hydraulic flow diagram for Effluent Treatment Plant should be prepared.
- The industry is recommended to adopt treated water reuse against discharging of treated water into the land.
- The industry shall conduct water and wastewater audit and groundwater quality study and also check the stability of the ETP.
- The industry shall provide piezometric wells in green belt area to monitor the ground water quality regularly.
- The industry shall develop the greenbelt area of 33% with local species plants as per CPCB guidelines.
- The industry is suggested to complete the MBR technology installation works for achieving effluent quality reuse standards.
- The proper infrastructure facilities shall provide for storage and handling of Thippi.
- The ETP is suggested to install the electromagnetic flow meters in inlet and outlet and check the water balance regularly.
- Biogas generation, power generation and sludge generation records should be maintained.
- Fresh water consumption and Biogas consumption records should be maintained.
- The sludge withdrawal rate of biological treatment system should be regulated so as to retain mean cell residence time in the range of 25-50 days.
- The chemical and biological sludge handling and treatment should be properly managed.

- The ETP should be operated by quality personnel and records should be maintained to establish sustained performance.
- Proper protective equipment should be given to the personnel involved in the cleaning of treatment units.
- The industry needs to implement measures to improve the Health, Safety and Environmental aspects in their unit, to the satisfactory level and practice all the mandatory safety systems, so as to protect the safety of workers and the environment.
- It is also recommended that the TNPCB shall periodically monitor the performance of the key treatment processes of the ETP and verify the monitoring and measurement being carried out by the ETP.

Dr. S. KANMANI, B.E.,M.E.,Ph.D.,
Professor & Director
Centre for Environmental Studies
Anna University, Chennai-600 025.

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ANNEXURE I

DESIGN REPORT

DESIGN FOR 500 KLD ETP

	BASIS OF DESIGN		
	DESIGN PARAMETER	**DESIGN VALUE**	**UNIT**
	Total Capacity of Plant	500	m^3/day
	Operating Hours Per Day (Working Hours)	24	Hrs
	Total Average Flow rate	20.8	m^3/hr
	Peak Factor Considered	1.5	
	Peak flow rate	31	m^3/day
	CHARACTERISTICS OF TRADE EFFLUENT		
	Biological Oxygen Demand, BOD	5000	mg/L
	Total Dissolved Solids, TDS	5000	mg/L
	Total Suspended Solids, TSS	7500	mg/L
	pH	3.8 - 4.5	
1	**COLLECTION TANK**		
	Design Flow rate	20.8	m^3/hr
	Volume of Tank	**6.5**	**m^3**
	Side Water Depth (SWD)	1.6	m
	Free Board (FB)	0.4	m
	Area of Tank	4.06	m^2
	Total Height of Tank	**2**	**m**
	Detention time	**0.31**	**hr**
	Number of tanks	**1**	**No**
	Provided size of tank	**3.4 x 1.2 x 2.0**	**m**
2	**OVERHEAD EQUALIZATION TANK**		
	Design Flow rate	20.8	m^3/hr
	Volume of Tank	**8**	**m^3**
	Side Water Depth (SWD)	1	m
	Free Board (FB)	0.5	m
	Area of Tank	7.80	m^2
	Total Height of Tank	**1.50**	**m**
	Detention time	**0.37**	**hr**
	Number of tanks	**1**	**No**
	Provided size of tank	**3.0 x 2.6 x 1.5**	**m**

3	**ANAEROBIC HUSMAR DIGESTERS**		
	Design Flow rate	500	m^3/day
	Operating Hours	24	Hrs
	Average Flow rate	20.8	m^3/hr
	Yield Coefficient	0.58	kg VSS/kg BOD
	Decay Coefficient	0.05	per Day
	Inlet BOD	5000	mg/L
	Outlet BOD	1200	mg/L
	Removal Efficiency of BOD	76	%
	BOD Load	2500	kg/d
	BOD removal Load	1900	kg/d
	Hydraulic Retention Time Considered	15	Days
	Volume of Tank Based on HRT	**7500**	**m^3**
	Volume of Tank provided	**9600**	**m^3**
	Number of Tanks/Unit	6	Nos
	Volume of Each Tank	1600	m^3
	Side Water Depth (SWD)	13	m
	Free Board (FB)	0	m
	Area of Tank	755	m^2
	Total Height of Tank	**13**	**m**
	Number of Tanks	**6**	**Nos**
	Provided size of anaerobic round tank	**12.5 x 13**	**m**
4	**ANAEROBIC LAGOON - 1**		
	Design Flow rate	250	m^3/day
	Operating Hours	24	Hrs
	Average Flow rate	10.4	m^3/hr
	Yield Coefficient	0.58	kg VSS/kg BOD
	Decay Coefficient	0.05	per Day
	Inlet BOD	1200	mg/L
	Outlet BOD	450	mg/L
	Removal Efficiency of BOD	62.5	%
	BOD Load	300	kg/d
	BOD removal Load	187.5	kg/d
	Hydraulic Retention Time Considered	13	Days
	Volume of Tank Based on HRT	**3250**	**m^3**
	Volume of Tank provided	**4300**	**m^3**
	Side Water Depth (SWD)	3	m
	Free Board (FB)	0.3	m
	Area of Tank	1433.33	m^2

	Total Height of Tank	**3.3**	**m**
	Number of Tanks	**1**	**No**
	Provided size of tank	**32 x 45 x 3.3**	**m**
5	**ANAEROBIC LAGOON - 2**		
	Design Flow rate	250	m^3/day
	Operating Hours	24	Hrs
	Average Flow rate	10.4	m^3/hr
	Yield Coefficient	0.58	kg VSS/kg BOD
	Decay Coefficient	0.05	per Day
	Inlet BOD	1200	mg/L
	Outlet BOD	450	mg/L
	Removal Efficiency of BOD	62.5	%
	BOD Load	300	kg/d
	BOD removal Load	187.5	kg/d
	Hydraulic Retention Time Considered	13	Days
	Volume of Tank Based on HRT	**3250**	**m^3**
	Volume of Tank provided	**3650**	**m^3**
	Side Water Depth (SWD)	3	m
	Free Board (FB)	0.3	m
	Area of Tank	1216.67	m^2
	Total Height of Tank	**3.3**	**m**
	Number of Tanks	**1**	**No**
	Provided size of tank	**32 x 38 x 3.3**	**m**
6	**AERATION TANKS**		
	Design Flow rate	500	m^3/day
	Operating Hours	24	Hrs
	Average Flow rate	20.8	m^3/hr
	Sludge Age (15 - 25 Days)	25	Days
	Yield Coefficient	0.58	kg VSS/kg BOD
	Decay Coefficient	0.05	per Day
	Inlet BOD	450	mg/L
	Outlet BOD	70	mg/L
	Removal Efficiency of BOD	84.4%	
	BOD Load	225	kg/d
	BOD removal Load	190	kg/d
	Food/Micro Organsims, F/M ratio	0.12	
	Mixed Liquid Suspended Solids, MLSS	3500	mg/L
		3.5	g/L

	Percentage of MLVSS/MLSS	60%	
	Hydraulic Retention Time Considered	4	Days
	Volume of Tank Based on HRT	**2000**	**m^3**
	Volume of Tank Based on F/M & MLSS	**536**	**m^3**
	Volume of Tank provided	2880	m^3
	Volume Considered (Max Volume)	**2880**	**m^3**
	Number of Tanks/Unit	8	Nos
	Volume of Each Tank	360	m^3
	Side Water Depth (SWD)	3.2	m
	Free Board (FB)	0.2	m
	Area of Tank	346	m2
	Total Height of Tank	**3.4**	**m**
	Number of Tanks	**8**	**Nos**
	Provided size of each aeration tank	**12 x 3.4**	**m**
	OPTION - I		
	AIR REQUIREMENT FOR AERATION		
	Average Flow rate	20.8	m^3/hr
	Max Inlet BOD	450	mg/L
	Outlet BOD	70	mg/L
	Oxygen required to remove BOD load	190	kg/day
		7.9	kg/hr
	Oxygen Requirement	2	kg/kg of BOD
	Total Oxygen required	15.83	kgs/hr
	Density of Air	1.2	kg/m^3
	% of Oxygen in air (23%)	0.23	
	Alpha Factor	0.65	
	Beta Factor	0.95	
	Tolerance of Air Blower (95%)	0.95	
	Oxygen Transfer Efficiency	0.2	
	Air requirement for Aeration	**489**	**m^3/hr**
	Number of Tanks	8	Nos
	OPTION - II		
	AIR REQUIREMENT FOR AERATION		
	Average Flow rate	20.8	m^3/hr
	Max Inlet BOD	450	mg/L
	Outlet BOD	70	mg/L
	Oxygen required to remove BOD load	190	kg/day
		7.9	kg/hr

	Density of Air	1.201	kg/m^3
	Oxygen Fraction in air (% by weight)	13	kg/m^3
	Design Temperature	28	Deg C
	Alpha Factor	0.65	
	Beta Factor	0.95	
	SOTE value for Diffusers	32	
	Saturation value of DO at MSl at 27 Deg C	7.95	mg/L
	Saturation value of DO at Field Conditions	7.31	mg/L
	DO Saturation Concentration for Tap Water	9.08	mg/L
	DO Saturation Concentration for Field Condition	10.13	mg/L
	Standard DO for Sewage water at Field Conditions	8.16	mg/L
	Minimum DO to be maintain in the Tank	2.00	mg/L
	Value of Factor	1.015	
	Field Oxygen Transfer Efficiency	18	%
	Actual Oxygen required	44	kg/hr
	Total Quantity of air required	340	kg/hr
	Density of Air	1.201	kg/m^3
	Total Quantity of air required	283	m3/hr
	Tolerance of Air Blower (85%)	0.85	
	Air requirement for Aeration	**333**	**m^3/hr**
	Air requirement for Aeration (Max)	**489**	**m^3/hr**
	AERATION SYSTEM (DIFFUSERS)		
	Total Air requirement for tanks	489	m^3/hr
	Fine Bubble Diffusers volume	1.70	m^3/hr
	Total Diffusers provided	1184	Nos
	Number of Tanks	**8**	**Nos**
	Air blowers capacity provided for AT and EQT	**2000**	**m^3/hr**
7	**PRIMARY SETTLING TANKS**		
	Design Flow rate	500	m^3/day
	Design Flow rate	20.8	m^3/hr
	Volume of each Tank	**1150**	**m^3**
	Side Water Depth (SWD)	3	m
	Free Board (FB)	0.4	m
	Area of Tank	383.33	m^2
	Total Height of Tank	**3.40**	**m**
	Number of Tanks	**2**	**No**
	Provided size of each tank	**32 x 12 x 3.4**	**m**

	RETURN SLUDGE TRANSFER PUMP		
	RAS Recycle ration	0.5	
	Return Sludge Transfer Pump Flow rate	10.4	m^3/hr
	No of Pumps	2	Nos
8	**CLARIFIER**		
	Design Flow rate	500	m^3/day
	Surface overflow rate	35	$m^3/ m^2/day$
	Area of tank required	**14.3**	**m^2**
	Diameter of Tank	**4.3**	**m**
	Side Water Depth (SWD)	3	m
	Free Board (FB)	0.4	m
	Total Height of Tank	**3.4**	**m**
	Number of Tanks	**1**	**No**
	Area of Tank provided	**69.9**	**m^2**
	Volume of Tank	**209.7**	**m^3**
	Detention time	**10.08**	**Hrs**
	Provided size of tank	**23.3 x 3**	**m**
9	**MEMBRANE BIOREACTOR (MBR) EXTENSION**		
9A	**DIFFUSED AERATION TANK**		
	Design Flow rate	500	m^3/day
	Operating Hours	24	Hrs
	Average Flow rate	20.8	m^3/hr
	Sludge Age (15 - 25 Days)	25	Days
	Yield Coefficient	0.58	kg VSS/kg BOD
	Decay Coefficient	0.05	per Day
	Inlet BOD	70	mg/L
	Outlet BOD	20	mg/L
	Removal Efficiency of BOD	71.4	%
	BOD Load	35	kg/d
	BOD removal Load	25	kg/d
	Food/Micro Organisms, F/M ratio	0.12	
	Mixed Liquid Suspended Solids, MLSS	3500	mg/L
		3.5	g/L
	Percentage of MLVSS/MLSS	60%	
	Hydraulic Retention Time Considered	0.5	Days
	Volume of Tank Based on HRT	250	m^3
	Volume of Tank Based on F/M & MLSS	83	m^3

	Volume of Tank provided	350	m^3
	Volume Considered (Max Volume)	**350**	**m^3**
	Number of Tanks/Unit	1	Nos
	Volume of Each Tank	350	m^3
	Side Water Depth (SWD)	4.4	m
	Free Board (FB)	0.2	m
	Area of Tank	346	m^2
	Total Height of Tank	**4.6**	**m**
	Number of Tanks	**1**	**Nos**
	Provided size of each aeration tank	**14.25 X 5.7 X 4.6**	**m**
	OPTION - I		
	AIR REQUIREMENT FOR AERATION		
	Average Flow rate	20.8	m^3/hr
	Max Inlet BOD	70	mg/L
	Outlet BOD	20	mg/L
	Oxygen required to remove BOD load	25	kg/day
		1.0	kg/hr
	Oxygen Requirement	2	kg/kg of BOD
	Total Oxygen required	2.083	kgs/hr
	Density of Air	1.2	Kg/m^3
	% of Oxygen in air (23%)	0.23	
	Alpha Factor	0.65	
	Beta Factor	0.95	
	Tolerance of Air Blower (95%)	0.95	
	Oxygen Transfer Efficiency	0.2	
	Air requirement for Aeration	**64**	**m^3/hr**
	Number of Tanks	1	No
	OPTION - II		
	AIR REQUIREMENT FOR AERATION		
	Average Flow rate	20.8	m^3/hr
	Max Inlet BOD	70	mg/L
	Outlet BOD	20	mg/L
	Oxygen required to remove BOD load	25	kg/day
		1.5	kg/hr
	Density of Air	1.201	kg/m^3
	Oxygen Fraction in air (% by weight)	13	kg/m^3
	Design Temperature	28	Deg C
	Alpha Factor	0.65	

	Beta Factor	0.95	
	SOTE value for Diffusers	32	
	Saturation value of DO at MSl at 27 Deg C	7.95	mg/L
	Saturation value of DO at Field Conditions	7.31	mg/L
	DO Saturation Concentration for Tap Water	9.08	mg/L
	DO Saturation Concentration for Field Condition	10.13	mg/L
	Standard DO for Sewage water at Field Conditions	8.16	mg/L
	Minimum DO to be maintain in the Tank	2.00	mg/L
	Value of Factor	1.015	
	Field Oxygen Transfer Efficiency	18	%
	Actual Oxygen required	6	kg/hr
	Total Quantity of air required	45	kg/hr
	Density of Air	1.201	kg/m^3
	Total Quantity of air required	37	m^3/hr
	Tolerance of Air Blower (85%)	0.85	
	Air requirement for Aeration	**44**	**m^3/hr**
	Air requirement for Aeration (Max)	**64**	**m^3/hr**
	AERATION SYSTEM (DIFFUSERS)		
	Total Air requirement for tanks	64	m^3/hr
	Fine Bubble Diffusers volume	1.70	m^3/hr
	Total Diffusers provided	125	Nos
	Number of Tanks	**1**	**Nos**
	Air blowers capacity provided for AT and EQT	**500**	**m^3/hr**
9B	**SETTLING TANK**		
	Design Flow rate	500	m^3/day
	Design Flow rate	20.8	m^3/hr
	Volume of Tank	**280**	**m^3**
	Side Water Depth (SWD)	4.4	m
	Free Board (FB)	0.2	m
	Area of Tank	63.64	m^2
	Total Height of Tank	**4.60**	**m**
	Number of Tanks	**1**	**No**
	Provided size of each tank	**14.25 X 4.5 X 4.6**	**m**
9C	**MBR SUBMERSIBLE TANK**		
	Design Flow rate	500	m^3/day
	Average Flow rate	20.8	m^3/hr
	Volume of Tank	**130**	**m^3**

	Side Water Depth (SWD)	4.4	m
	Free Board (FB)	0.2	m
	Area of Tank	29.55	m^2
	Total Height of Tank	**4.60**	**m**
	Number of Tanks	**1**	**No**
	Provided size of each tank	**9.3 X 3.2 X 4.6**	**m**
	Membrane Module Type		
	Number of Membrane Cassette	6	No
	Number of Membrane Modules per Cassette	26	Nos
	Membrane area per module	**31**	**m^2**
	Total Membrane Area per cassette	**806**	**m^2**
	Membrane Material		
	Membrane fiber ID	1.0	mm
	Membrane fiber OD	**2.0**	**mm**
	Nominal Pore Size	0.02	µm
	Membrane Type		
	Membrane configuration		
	Max Extraction pressure	**60**	**kPa**
	Max operation temperature	**40**	**Deg c**
	Membrane module size	2.1 x 0.7 x 0.07	m
	Each Cassette Dimension	2.1 x 0.8 x 2.5	m
9D	**SETTLING TANK**		
	Design Flow rate	500	m^3/day
	Design Flow rate	20.8	m^3/hr
	Volume of Tank	**120**	**m^3**
	Side Water Depth (SWD)	4.4	m
	Free Board (FB)	0.2	m
	Area of Tank	27.27	m^2
	Total Height of Tank	**4.60**	**m**
	Number of Tanks	**2**	**No**
	Provided size of each tank	**4.5 x 3.2 x 4.6**	**m**
9E	**PERMEATE TANK**		
	Design Flow rate	500	m^3/day
	Average Flow rate	20.8	m^3/hr
	Volume of Tank	**120**	**m^3**
	Side Water Depth (SWD)	4.4	m
	Free Board (FB)	0.2	m
	Area of Tank	27.27	m^2

	Total Height of Tank	**4.60**	**m**
	Detention Time	**5.8**	**Hrs**
	Number of Tanks	**2**	**Nos**
	Provided size of each tank	**4.5 x 3.2 x 4.6**	**m**
10	**Sludge Drying Beds**		
	BOD Load	2500	kg/d
	Sludge produced (30% of BOD load)	750	kg/day
	Sludge consistency	1.0	%
	Sludge generated	75	m^3/day
	Sludge height	**0.8**	**m**
	Area required	**93.75**	**m^2**
	Area provided	**154.7**	**m^2**
	Number of beds	**5**	**Nos**
	Provided Size of beds	**10.18 ×15.24 ×1.10**	**m**

ANNEXURE II

STANNDARD OPERATING PROCEDURES

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STANDARD OPERATING PROCEDURE

EFFLUENT TREATMENT PLANT

OBJECTIVE / SCOPE

To ensure that the trade effluent from the Production unit is being treated, managed, and maintained in the ETP.

RESPONSIBILITY

Operation / Maintenance Personnel

SAFETY INFORMATION

All necessary protective clothing must be worn as required during operation and maintenance.

- Safety Footwear
- Gloves
- Headgear (when required)
- Safety Goggles (when required)
- Uniforms are to be always worn on company property.

PROCEDURE

EFFLUENT TREATMENT PLANT (ETP) MANAGEMENT

1. Collect the trade effluent in collection tank and pump to the Overhead equalization tank. Ensure the operating pump is in operation and the standby spare pumps are ready for operation.
2. The effluent from the Overhead equalization tank is to be equally distributed to all the six Anaerobic Digesters for Anaerobic biological bacterial treatment which degrades organic matter present in the effluent and reduced COD and BOD from the effluent in turn generating renewable Biogas fuel.
3. Ensure that the Methane containing Biogas generated in each Anaerobic Digester are conveyed by Blowers either for Thermal use or Power Generation.
4. Ensure that the partly treated effluent from the Anaerobic Digesters are fed evenly to the two Anaerobic Lagoons for further biological bacterial treatment for reduction of further COD and BOD.
5. From the Anaerobic Lagoons, ensure the partly treated effluent is fed equally to the downstream eight Aeration Tanks for Aerobic bacterial treatment where biological culture

is developed which degrades organic matter present in the effluent and reduced COD and BOD from the effluent.

6. Carry out aeration by positive displacement air blowers by means of diffused aeration. Monitor the Dissolved Oxygen level using ORP sensor, MLSS and Sludge Volume. Required quantity of RAS is to be circulated back to the Aeration Tanks for maintenance of bacterial load.
7. The partly treated effluent from the Aeration tanks are to be allowed in the subsequent Primary settling tanks from where sludge is to be allowed to settle by gravity and then drained from the bottom of the settling tank to the sludge beds.
8. Allow the partly treated effluent to be clarified in the secondary clarifier and sediment from clarifier to be sent to sludge bed.
9. Before clarification, dosage of Alum / Ferrous sulphate is to be added in a flocculation tank. Make up flocculant mix in dosing tank and feed to the flocculation tank.
10. The treated wastewater from the clarifier is then disposed to the greenbelt maintained within the unit.
11. Monitor the quality and flow through the ETP and effluent discharge and adjust the plant equipment accordingly.
12. Keep the Effluent plant area in a tidy condition.
13. Report any faults to the Plant Manager.
14. Effluent sample to be collect once per day once plant has been running. Sample is to be taken in a bottle which can be obtained from the lab. Sample then to go to the laboratory for testing.

PRE-OPERATIONAL CHECKING

1. Check the requisite materials in the First Aid Box and ensure the expiry period.
2. Check the refilling time or expiry of fire extinguishers.
3. Check for any broken parts or damage in equipments and if found then inform to the supervisor immediately.
4. Check the moving parts with covers or guards in position.
5. Be careful while stepping to see the effluent level in the treatment tanks.
6. Carefully walk over the platforms of the Digesters, Aeration tanks and Clarifier.
7. If see any leakage from any ETP treatment systems or pipeline, then make immediate

arrangement for stopping and reporting the same.

8. Ensure that areas, such as chemical mixing room, pump room and electrical control room and ETP surroundings are properly lighted and safe to work.

HOUSEKEEPING / CLEANING

1. ETP plant area to be cleanly maintained.
2. ETP plant area to be cleaned weekly.
3. Supplies and materials those used at the ETP plant should be stored in a neat and orderly manner.
4. Extraneous materials not in use shall be cleared from operational areas.
5. Avoid the floors to be slippery due to water or aqueous solutions.
6. Other areas around the effluent treatment plant to be kept tidy by removing any rubbish and removal of weeds.

ENVIRONMENTAL ASPECTS

1. The company accepts an obligation to comply with all relevant environmental legislation, and statutory requirements.
2. The company regards the protection of the environment, and the prevention of pollution, as a mutual objective between management, employees, and all other interested parties.

Annexure No.6 175

VARALAKSHMI STARCH INDUSTRIES (P) LTD.

MRFS. & EXPORTERS : SUPER HIGH GRADE TAPIOCA SAGO, TAPIOCA STARCH, MAIZE STARCH, MODIFIED STARCHES & SAGO PAPADS

VSIPL/TNPCB/Chair Person/2025-26/218

Date: 08.08.2025

To:

The Chairperson,

Tamil Nadu Pollution Control Board,

76, Mount Salai, Guindy,

Chennai- 600032

Sub: Request to withdraw the direction of providing Bank Guarantee of Rs. 50 lakhs as per TNPCB Proceeding No.TNPCB/T2/F.025102/Directions/Water/2023 Dt. 16.02.2023 and Renewal of our original Consent order.

Respected Sir/Madam,

Our industry, M/s. Varalakshmi Starch Industries Private Limited, is an Agrobased rural medium scale and export-oriented Industry. Our Industry has been operating for the past 24 years with valid consent orders from TNPCB continuously without any violations in regard to compliance to PCB Norms.

Currently our industry is operating without a valid consent order from the TNPCB and operating only on the basis of theOrder of Stay on TNPCB's closure order provided by the Hon'ble NGT (Appeal No. 77 of 2022) with huge loss of Exports and loss of money.

In this regard,as per the TNPCB proceeding dated 16.02.2023,we have complied all the 11 directions as mentioned in the Proceedings Dt. 16.02.2023. Also Mrs. S Malarvizhi JCEE, TNPCB, Chennai in her report Dt.24.04.2025 filed under Appeal No.77/2022 on behalf of first Respondent TNPCB with the Hon'ble NGT also confirmed that we have complied with the directions issued in the Proceedings Dt. 16.02.2023other then Ground Water Quality Study which is under progress we will submit within the next hearing(Enclosure No. 1). For the Last 2 years (Jan 2023 to March 2025), samples of treated waste water were collected by the TNPCB Officials at the outlet of our ETP and tested in their Advanced Environmental laboratory, Salem. All the Report of Analysis of the treated waste waterwere within the standards proving that our ETP is operating efficiently for treating our waste water and achieves the treated effluent standards prescribed by the Board (Enclosure 2).

Received

Regd. Office : " Varalakshmi Tower ", II Floor, No. 127/1, Gandhi Road, Salem - 636 007. T.N. India.
Email : office@varalakshmistarch.com | Mobile : 94426 13174, 94421 33794
Factory : No. 7/114-126, Bommidi Main Road, Pappireddipatti (Po), Dharmapuri Dt. - 636 905.
GSTIN : 33AABCV0094P1Z2 | CIN No. U01532TZ1995PTC006136
www.varalakshmistarch.com

IS : 899 CM/L-6100012769 TAPIOCA SAGO

IS : 1319 CM/L-6299891 TAPIOCA STARCH

The final 12th direction cited in the TNPCB Proceedings dated 16.02.2023 states: "In order to ensure compliance with all the above directions 1 to 11, the unit shall furnish a Bank Guarantee of Rs. 50 lakhs valid for one year to the TNPCB within a month's time."

Since we have duly complied with all the other directions 1 to 11 mentioned in the proceedingsdt.16.02.2023,with all the revamping works in our ETP completed, we humbly request you to withdraw the direction of providing a bank guaranteeof Rs.50 lakhs as given in the Proceedings Dt. 16.02.2023 and provide us the renewal of our consent order.

Thanking you.

For Varalakshmi Starch Industries Private Limited,

V.Anbalagan

(Managing Director)

Enclosures:

1. Report Dt. 24.04.2025 of Mrs. S Malarvizhi JCEE, TNPCBunder O.A. 47/2023 on behalf of the first Respondent TNPCB.
2. ROA from Advanced Environmental Laboratory, Salem of our treated waste water collected by the TNPCB Officials from Jan 2023 to March 2025.

Copy to: The Member Scretary,TNPCB, Chennai.

Annexure No. 7

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தமிழ்நாடு எரிசக்தி வளர்ச்சி நிறுவனம்
Tamilnadu Energy Development Agency
5th Floor EVK Sampath Maaligai, College Road, Chennai 600 006
☎ 8224830, 8236592, Fax No : 8222971

Lr.No. 4703/BE/97 dated 1.6.2000

To
Shri V.K Jain
Principal Scientific Officer
National Bio Energy Board
Ministry of Non conventional Energy Sources
Block No.14, CGO Complex,
Lodhi Road,New Delhi 110 003

Sir,

Sub: Setting up of High rate Biomethanation based demonstration plant at M/s. Varalakshmi Starch Industries, Salem

****

As decided during the discussion on 25th May 2000 at MNES office, please find enclosed the xerox copy of the advertisement for reinvitation of bids on the above subject.

The consent of number of digesters as accepted by the Technical Consultant Dr. Sudhi Mukherjee, Research Professor, New Jersey Institute of Technology (NJIT), Newark, U.S.A. may be indicated immediately in order to finalise the specification.

May I look forward for your immediate response in this regard?

Yours faithfully
for Tamilnadu Energy Dev. Agency

for Chairman & Managing Director

Copy to:
Thiru. V. Anbalagan
Managing Director
Varalakshmi Starch Industries Limited
150 D, Manimekalai Street,Fairlands, Salem 636 016

C:\Bio Energy\bio\4703.doc

NJIT
New Jersey Institute of Technology

A Public
Research University

NEWARK COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL AND
ENVIRONMENTAL ENGINEERING

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October 23, 2000

Mr. R. Sathpathy, IAS
Chairman and Managing Director
Tamilnadu Energy Development Agency
EVK Sampath Maaligai, V Floor
College Road, Chennai 600 006
India

Subject: Biomethanation Sub - Project at Varalakshmi Starch Industries Ltd., Salem, Tamilnadu, India

Dear Mr. Sathpathy:

Please find enclosed 3 (three) copies of the MOU titled "International Consultant Contract Proposal - High Rate Biomethanation Project for Sago/Starch Wastewaters". Dr. Sudhi Mukherjee and myself have signed these proposals on behalf of the Technology Assistance Provider. We would greatly appreciate it if you could send back one copy to my attention after obtaining the required signature(s) from your organization.

We look forward to working with you and the other project participants on this project. Please feel free to contact Sudhi or me if you should have any questions.

Sincerely,

Dorairaja Raghu

Dorairaja, Raghu, Ph.D., PE

cc. Sudhi Mukherjee, Ph.D.

Enc.

UNIVERSITY HEIGHTS
NEWARK, NJ 07102-1982
973.596.2444/2442

BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE AT CHENNAI

Appeal No. 77 of 2022

M/s. Varalakshmi Starch Industries (P) Ltd.,

Rep. by its Managing Director V.Anbalagan
Having its office at:
"Varalakshmi Tower"
No.127/1, 2nd floor,
Gandhi Road,
Salem- 636 007. ...Appellant

AND

Tamil Nadu Pollution Control Board
Rep. by its Chairperson
76, Anna Salai, Guindy Industrial Estate,
Guindy,
Chennai – 600032 & Ors., ...Respondents,

ADDITIONAL AFFIDAVIT ALONG WITH ANNEXURES

DATE:21.02.2026