Third Report of the Vishwamitri Committee

(Constituted by the Hon'ble Gujarat State Human Rights Commission)

In the Matter of

HRC/2024/PRESS/205/Vadodara City/legal-1

20 August 2025

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Report

After the Second Report, this Committee continued the monitoring of the ongoing works by the VMC and Irrigation Department and suggestions towards the same.

The table below shows the information requested and awaited from concerned authorities.

Table 1:Information Requested and Not Received from Concerned Authorities

Sr. No.	Information Requested	Information Received
1	Superimposed map of all existing structures (temporary and permanent) within the demarcated 5-year and 10-year floodplain maps.	Will be shared soon
2	Map of all land parcels with ownership (public and private) within the demarcated 5-year and 10-year floodplain maps.	Will be shared soon
3	Reports and Observations submitted by the appointed wildlife volunteers, experts, and NGOs.	Will be shared soon
4	VMC Completion Report.	Will be shared soon
5	Spatial intervention action plan for crocodiles and other wildlife: a. Locations of crocodile deaths that have occurred after January 2025. b. Post-mortem reports of crocodile deaths along with the inference drawn by the concerned authorities.	Awaiting

	c. Information on rescue, capture and/or translocation of crocodiles, if any. d. Cause of deaths of Fishes on and around 03.05.2025 in the river near Dena bridge (NH 48). We were informed about this by the wildlife volunteers during our visit on 03.05.2025. e. Cause of fire near Mangal Pandey bridge on 03.05.2025.	
6	Biodiversity expert's suggestions action plan.	Awaiting
7	Superimposition of highway project (NH48) activity / interventions (temporary / permanent) on the floodplain map.	Awaiting
8	Detail action plan for plantation from Parks & Gardens, VMC.	Will be shared soon
9	Reports by the wildlife volunteers and NGO's.	Will be shared soon
10	Related documents, location specific designs, execution, operation and maintenance plan for bank stabilization using gabion walls.	Will be shared soon
13	Drone surveys of works done in the tributaries – Bhukhi and its tributaries, Bahucharaji, Mashia kaans, Ruparel kaans, Undera – Gotri kaans, T.B. Hospital – Vasna kaans, Kalali kaans, Gotri-Bhayali kaans, Maneja Kaans, Airforce kaans, Vasna – Banco kaans, Jambuva and its tributaries, etc. (as per document received from VMC).	Will be shared soon
14	Contour (topography) data of the entire Watershed.	Will be shared soon

The table below shows the information requested and received from concerned authorities.

Table 2:Information Requested and Received from Concerned Authorities

Sr. No.	Information Requested	Information Received
1	Floodplain maps (5 and 10 year return period) created by SECON.	Received from VMC
2	Maps of ongoing "desilting" and "resectioning" works across the 4 sections in VMC jurisdiction and 6 packages in the downstream areas under the jurisdiction of the Irrigation Department - print and soft copy.	Received
3	Drone videos dated February 2025, March 2025, April 2025, May 2025 (2), of before, during and post "desilting" and "resectioning" works in respective jurisdictions.	Received
4	Drone survey of Vishwamitri River outfalls from GPCB, September 2024.	Received from GPCB
5	Relevant documents pertaining to the Vishwamitri River in connection with ongoing construction activities under NHSRCL Project (Bullet Train) in the floodplains.	Received from NHSRCL
6	Drone survey of Vishwamitri River outfalls from VMC, May 2025.	Received from VMC

7	Log book of rescue events and other observations related to wildlife activities from Zoo Authorities.	Received but Need detailed data
8	Post mortem reports of 3 species: flapshell turtle, checkered keelback, monitor lizard.	Awaiting reports of crocodile deaths.
9	Details of coir installations to address erosion – GPS locations, extent and quantifications, including photographs.	Drone videos received.
10	Drone survey of the desilting works from the reservoirs of Ajwa, Pratapura to Pingalwada, dated 10.06.2025, 11.06.2025, 22.06.2025, 29.06.2025, 30.06.2025, 11.07.2025, 14.08.2025, and 16.08.2025.	Received from VMC and Irrigation department.
11	Drone survey of 2024 floods.	Received from VMC.
12	Photographs of Action taken by NHSRCL towards removal of silt at Bullet Train Columns as per Reports of Vishwamitri Committee and discussions during meetings.	Received from NHSRCL.
13	Periodic drone surveys after rain events of the desilting works from VMC, at the reservoirs of Ajwa, Pratapura and new detention pond at Dena village, and within VMC boundaries.	Received from VMC.
14	Periodic drone surveys after rain events of the desilting works from Irrigation Department, downstream of Maretha.	Received from Irrigation Department.

15	NHAI action plan for pre monsoon and post completion of works.	Received Reports from NHAI.
16	Superimposition of bullet train project activity / interventions (temporary / permanent) on the floodplain map.	Received from NHSRCL.
17	Related documents, Tender, Specification, Fixing details, operation and maintenance plan for bank stabilization using gabion walls.	Received Locations, length of gabions, tender.
18	Related documents, Tender, Specification, Fixing details, operation and maintenance plan for bank stabilization using coir and coco logs addressing wildlife concerns.	Received from VMC.
19	Irrigation Department Completion Report.	Received.
20	Brief Action Taken Report on Issue of Obstruction to Dhadhar River Flow at Sadad Village, Padra Taluka, Vadodara District.	Report Received.
21	Data pertaining to aquifer (confined and unconfined) and subsurface flow regimes.	Received for Vadodara District.
22	Waterlogging locations of July 2024 within VMC areas.	Received from VMC.

The table below logs the course of events which have been elaborated upon later as Annexure I.

Table 3: Site Visits and Meetings

Sr. No.	Date	Events	Particulars
1	28.07.2025	Meeting with VMC Municipal Commissioner VMC Officials, NHSRCL Officials, and NHAI Officials.	VMC Conference Hall
2	30.07.2025	Site Visit with SWM team of VMC – Debris dumping locations.	Sama Bharwadvas, Sama Bridge, Ambedkar Bhavan, Akota Smashan, Munjhmahuda Bridge
3	08.08.2025	Meeting with VMC Officials from Parks and Gardens Department.	Parks and Gardens Office
4	14.08.2025	Meeting with GPCB RO.	GPCB office at GERI compound
5	18.08.2025	Meeting with Parks and Gardens Department, Futuristic Planning Cell, VMC Architect.	VMC
6	18.08.2025	Meeting with Solid Waste Management Department, VMC.	SWM Office, VMC

7	18.08.2025	Meeting with VMC Municipal Commissioner VMC Officials, NHSRCL Officials, and NHAI Officials.	VMC Conference Hall

Observations and Recommendations

The following are the observation and recommendations of this committee:

1. Locations and tender documents of proposed gabion walls at various locations along the river, including bridges have been shared. It has been informed by the VMC that the detailed design of the gabion walls will be worked out based on the soil testing data at individual locations. However, this committee needs further discussions on:

    a. Identification of exact locations and stretches, other than bridges.

    b. Actual location and extent of gabion walls.

    c. Design of the gabions should factor in modified flow regime after the completion of the said desilting works.

    d. Design and implementation plans of the identified gabions to avoid permanent and irreversible damage to the river ecosystem.

    e. Explore alternative bank stabilisation methods to gabion walls for locations other than bridges.

    f. Location specific designs for each gabion should be devised as the context would vary.

    g. The proposed locations of gabion walls should be superimposed with existing crocodile dens and basking sites. The sites within 50 m of gabion wall need to be flagged.

    h. Mitigation measures to be adopted at such sites.

    i. The access route for construction activity of gabion walls should cause no disturbance to crocodile dens and basking sites.

It is recommended that decisions relating to the installation of gabion walls be taken after due process of discussions, site visits, deliberations and alternatives with this committee.

2. In response to the query raised by the committee regarding the obstruction of surface flow from East to West of the Delhi – Mumbai Expressway at Sadad village, the NHAI officials reported that there have been box culverts installed at intervals of 500 mt. However, the committee opines that the level of the Mumbai-Delhi Expressway near Sadad village on the Dhadhar river has ignored the floodplains of Dhadhar River and created obstructions in the natural water flow of farmlands during the monsoon, causing waterlogging in surrounding villages. This is evident from the photographs of waterlogging dated 29.08.2024 (Report 2, Annexure VIII, page 88) at the junction of the Delhi – Mumbai Expressway at Sadad village and the Vishwamitri River are discrepant to the discussion and therefore needs further clarification and action plan.

3. The NHAI, NHSRCL, Irrigation Department, and VMC should periodically monitor the natural and constructed storm waterways and regularly maintain them so to prevent flooding and waterlogging events.

4. To effectively curb illegal debris and municipal solid waste (MSW) dumping, a system should be established through various monitoring committees and subcommittees. These, when coordinated by the elected representatives can indeed act as overseers to prevent illegal debris and municipal solid waste dumping. Their role can include monitoring waste management practices, and identify areas of non-compliance, leading to corrective actions and potentially deterring future violations.

a. Overseeing and Monitoring Committees and Subcommittees to be formed to monitor and prevent the illegal Debris and Municipal Solid Waste dumping.
b. Corporators and MLAs, the Elected Representatives can initiate and explore the possibilities to coordinate and form Ward-wise Committees with Subcommittee of the Citizens focused on specific areas like housing societies. Such a system working at the 'ground zero' level, can develop outreach programs for waste segregation at source, collection, and proper scientific disposal with the help of VMC officials. The localised strategies are crucial for effective waste management as they consider the specific needs and challenges of each area.
c. The builders and contractors undertaking renovation, demolition and redevelopment projects should submit detailed plans for the disposal of debris to concerned authorities. These plans are a mandatory requirement under the Construction and Demolition Waste Management Rules, 2016. The rules mandate proper segregation, storage, and disposal of debris to prevent environmental damage and ensure efficient waste management.

5. At few locations, bank erosions have been observed and discussed with the VMC officials. It is noted that these locations were vulnerable and should not have been disturbed, which was repeatedly communicated with the VMC before the desilting works at such locations.

   It has been assured by the VMC officials that the coir will be reinstalled at disturbed areas at no additional costs as per the tender documents.

6. The superimposition of property data in the 5-year and 10-year floodplains, mapping of solid waste and action plan for C&D waste,

design details of gabion walls at multiple locations, contour data of the entire watershed, and the report of the '100 day' proposition of desilting works will be shared with the Committee by the VMC as and when possible.

7. It has been observed that in response to the desilting and resectioning actions, the river system has responded by naturally altering her banks, reinstating her disturbed meanders and slopes. The continuous response by the river system needs to be documented, analysed and deliberated upon. It is therefore strongly recommended that we need to respectfully acknowledge the recuperation process of the river before planning further interventions.

This committee will submit subsequent reports with the progression of work.

Dr. Neha Sarwate,
Environmental and Urban Planner

Rohit Prajapati,
Environment Activist, Researcher, and Writer

Dr. Ranjitsinh Devkar, PhD,
Zoologist

Dr. Jitendra Gavali, PhD,
Botanist

Mitesh Panchal,
Architect and Urban Planner

Annexure I: Visits, Meetings, and Discussions

28.07.2025: Meeting with Municipal Commissioner, VMC Officials, NHSRCL Officials, and NHAI Officials

Location: Conference Room, VMC Building

Time: 4:00 PM

Attendee:

Rohit Prajapati
Mitesh Panchal
Neha Sarwate

Discussions:

1. The following was discussed and agreed upon:
    a. Drone mapping of tributaries, waterways (kaans), wetlands, and ponds.
    b. Contour and Aquifer data needs to be shared with this committee.
    c. Documents related to proposed gabion walls, and coir works need to be shared with this committee.
    d. Reports by wildlife volunteer groups, postmortem reports to be shared with this committee.
    e. Plantation details, with monitoring and maintenance plans and biodiversity expert suggestions to be shared with this committee.
    f. Mechanism to prevent continued dumping of C&D waste and MSW into the riverine areas.
    g. Removal of debris from the various identified locations.
    h. Irrigation Department was requested for a latest drone survey along with their report.
    i. Parcel / plot / property maps superimposed on floodplains to be shared with this committee.

j. Land use guidelines to be formulated for plots and properties within the floodplains. This committee will assist in the same.

k. A separate committee for the efficient functioning of STPs to be formed consisting of members from GPCB, VMC, and independent experts.

l. Recruitment of appropriate staff and personnel should be the foremost priority.

m. Documentation of before and after work done to be shared by VMC.

n. This committee will have meetings with SECON to discuss their "Hydraulic Modelling-Based Evaluation of Channel Capacity Improvement in Vishwamitri River Post-Dredging" report and also for the purpose of data sharing.

30.07.2025: Site Visit with Solid Waste Management (SWM) Department Officials of VMC

Location: Downstream of Maretha

Time: 9:30 am

Attendee:

Neha Sarwate
Mitesh Panchal

Discussions:

1. Visited 5 locations with SWM team from VMC. The following was discussed:
    a. Identify and map the extent of debris along river.
    b. Identify depth and quantity of debris to be removed.
    c. Refer to soil bore data for triangulation purposes.
    d. Action Plan to mitigate C&D waste.
    e. Follow up meeting with SWM team in VMC on 5th August, 2025.
2. Such investigations should be conducted in all identified / unidentified locations in the city.
3. To establish a system to address C&D waste and MSW dumping and removal.

Dt. 30-7-25 Near Narhari Bridge -Fatehgunj

Dt. 30-7-25 Near Sama Bharwadwas

Dt. 30-7-25 Near Akota Smashan

Dt. 30-7-25 Near Sama Bharwadwas

08.08.2025: Meeting with Officials from Parks and Gardens Department of VMC

Location: Parks and Gardens Office, Sayaji Baug

Time: 4:30 pm

Attendee:

Neha Sarwate
Mitesh Panchal
Jitendra Gavali

Discussions:

The following was discussed and agreed upon:

1. Need to document the plantations carried out in terms of plant species, number of plants / trees, and locations in a tabulated manner along with maps.
2. Identify and share possible locations of future recreational spaces along the river under the Parks and Gardens Department.
3. Map the extent of the proposed intervention by the Parks and Gardens Department (New Dena Detention Pond, Riverview part 1 and 2 along Mangal Pandey Bridge, Vemali, adjacent to Regional Science Museum, and Opp. Chaya farms, Vadsar Bridge).
4. A joint meeting with the Futuristic Planning Cell, Parks and Gardens, Chief Architect and members of this committee to discuss design guidelines for such opportunities.

14.08.2025: Meeting with Regional Officer (RO) of GPCB, Vadodara Region.

Location: GPCB Office, GERI Compound, Vadodara.

Time: 4:00 pm

Attendee:

Rohit Prajapati
Mitesh Panchal
Jitendra Gavali

Discussions:

The following was discussed and agreed upon:

1. Status of all Sewage Treatment Plants (STP) of VMC were discussed.
2. Joint investigation of existing STPs between the Vishwamitri Committee, GPCB, other subject experts, and VMC needs to be planned.
3. Drainage network maps (sewage and storm water), including STP locations, connections and capacity needs to be obtained from VMC.
4. The Committee requested the Regional Officer to join the meeting on 18.08.2025 at VMC office for a detailed discussion with VMC officials.

18.08.2025: Meeting with Parks and Gardens Department, Futuristic Planning Cell, VMC Architect

Location: ER&S Office, VMC Building.

Time: 11:00 am

Attendee:

Rohit Prajapati
Mitesh Panchal
Jitendra Gavali
Neha Sarwate

Discussions:

The following was discussed and agreed upon:

1. The Parks and Gardens Department will map the plantations carried out in terms of plant species, number of plants / trees, and locations as discussed.
2. Identify and share possible locations of future plantations and recreational spaces along the river under the Parks and Gardens Department.
3. Map the extent of the proposed intervention by the Parks and Gardens Department (New Dena Detention Pond, Riverview part 1 and 2 along Mangal Pandey Bridge, Vemali, adjacent to Regional Science Museum, and Opp. Chaya farms, Vadsar Bridge).
4. Design guidelines need to be formulated towards a comprehensive plan for the River and no piecemeal projects to be deliberated upon.
5. The map showing superimposition of property data in the 5-year and 10-year floodplains was explained to the concerned officer.

18.08.2025: Meeting with Solid Waste Management Department, VMC

Location: SWM Office.

Time: 12:00 noon

Attendee:

Rohit Prajapati
Mitesh Panchal
Jitendra Gavali
Neha Sarwate

Discussions:

The following was discussed and agreed upon:

1. It was informed that the firm Facile Maven Pvt. Ltd. of Surat is the consultant to map and quantify the debris at the various locations along the River, and the work is in progress.
2. The 5 locations visited on 30.07.2025 will be considered as pilot initiatives.

18.08.2025: Meeting with Municipal Commissioner, VMC Officials, GPCB Officials, NHSRCL Officials, and NHAI Officials

Location: Conference Room, VMC Building.

Time: 4:00 pm

Attendee:

Rohit Prajapati
Mitesh Panchal
Jitendra Gavali
Ranjitsinh Devkar
Neha Sarwate

Discussions:

The following was discussed and agreed upon:

1. Status of all Sewage Treatment Plants (STP) of VMC were discussed. Joint investigation of existing STPs between the Vishwamitri Committee, GPCB, other subject experts, and VMC needs to be planned in the first week of September.
2. Drainage network maps (sewage and storm water), including STP locations, connections and capacity will be shared with the Committee by the VMC at the earliest convenience.
3. The reports by the wildlife volunteers and NGO's will be obtained from the Range Forest Officer, Vadodara and shared with the Committee by the VMC at the earliest convenience.
4. Institutions like National Center for Biological Sciences (NCBS), Wildlife Institute of India (WII), and The Maharaja Sayajirao University of Baroda (MSU) should be engaged to create a biodiversity action plan.
5. A drone survey of the remaining tributaries and kaans will be shared with the Committee by the VMC at the earliest convenience.

6. The NHAI submitted their report and locations of the underpasses and culverts and the issue of natural flow of surface waters at Sadad village was discussed in detail.
7. The NHAI is requested to submit a map of all locations along NH48 where cleaning works have been carried out, along with an action plan for regular maintenance.
8. VMC will share map showing crocodile dens and proposed gabions works.
9. The superimposition of property data in the 5-year and 10-year floodplains, mapping of solid waste and action plan for C&D waste, design details of gabion walls at multiple locations, contour data of the entire watershed, and data pertaining to aquifers and subsurface flow regimes, and the report of the '100 day' proposition of desilting works will be shared with the Committee by the VMC as and when possible.
10. The SECON team will share contour data for the entire watershed with the Committee and VMC at the earliest convenience.

Annexure II: Gabion Wall Tender & Locations (Relevant pages)

VADODARA
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TENDER FOR

DESIGNING AND CONSTRUCTION OF GABION WALL ALONG WITH VARIOUS BRIDGE AT VADODARA

VOLUME – I TECHNICAL BID

EXECUTIVE ENGINEER
FUTURISTIC PLANNING CELL OFFICE
VADODARA MUNICIPAL CORPORATION

APRIL - 2025

1

NATIONAL COMPETITIVE BIDDING

1. The Vadodara Municipal Corporation invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the following works.

TABLE

Package No.	Name of work	Approximate value of works (Rs.)	Bid security (EMD) (Rs.)	Cost of document	Period of completion	Class of Registration / Category of contractor if required
1	**DESIGNING AND CONSTRUCTION OF GABION WALL ALONG WITH VARIOUS BRIDGE AT VADODARA**	Rs. 42,74,56,682/-	Rs.85,49,134/-	Rs. 30,000/-	9 Months	The Contractors must have registration in appropriate class either with VMC, Central/State/PWD/M.E.S./Semi Government or other such institutions for the works

Note: The bidder who fills the tender on N-procure must have valid appropriate class registration. He must apply for the registration in VMC after issue of work order.

(B) SCHEDULE OF TENDERING: -

Sr. No.	Schedule	Time	Date	Place
1.	Downloading of Tender Documents		05.04.2025	The tender document for these works available on website https://tender.nprocure.com.
2A	Submission of Tender documents on n-procure Website	Up to 6:00 pm.	16.04.2025	Volume-I – Volume V shall be submitted on n-Procure Website.
2B	Submission of Tender Document and Prequalification Bid in Hard Copy of Volume-I only, EMD and Tender Fees (in original) and attested copies of all P.Q. Documents.	Up to 6:00 pm.	17.04.2025	Technical and Prequalification Bid in hard copy (Including Tender Fees, EMD) in separate sealed Envelope –A through RPAD/SPEED Post. Hand delivery OR Courier will not be accepted. Addressed to Executive Engineer, Futuristic Planning Cell Office, Room No. 204, second floor,Vadodara Municipal, Corporation, Khanderao Market Building, Rajmahal Road, Vadodara - 390 001 **(Even if the hardcopy of the tender is reached late due to post department, the tender will not be accepted).**
~~2.~~	~~Pre- Bid Meeting~~	~~11:00 am~~	~~00/00/2025~~	~~Room No. 204, second floor,Vadodara Municipal Corporation, Khanderao Market Building, Rajmahal Road, Vadodara – 390 001.~~

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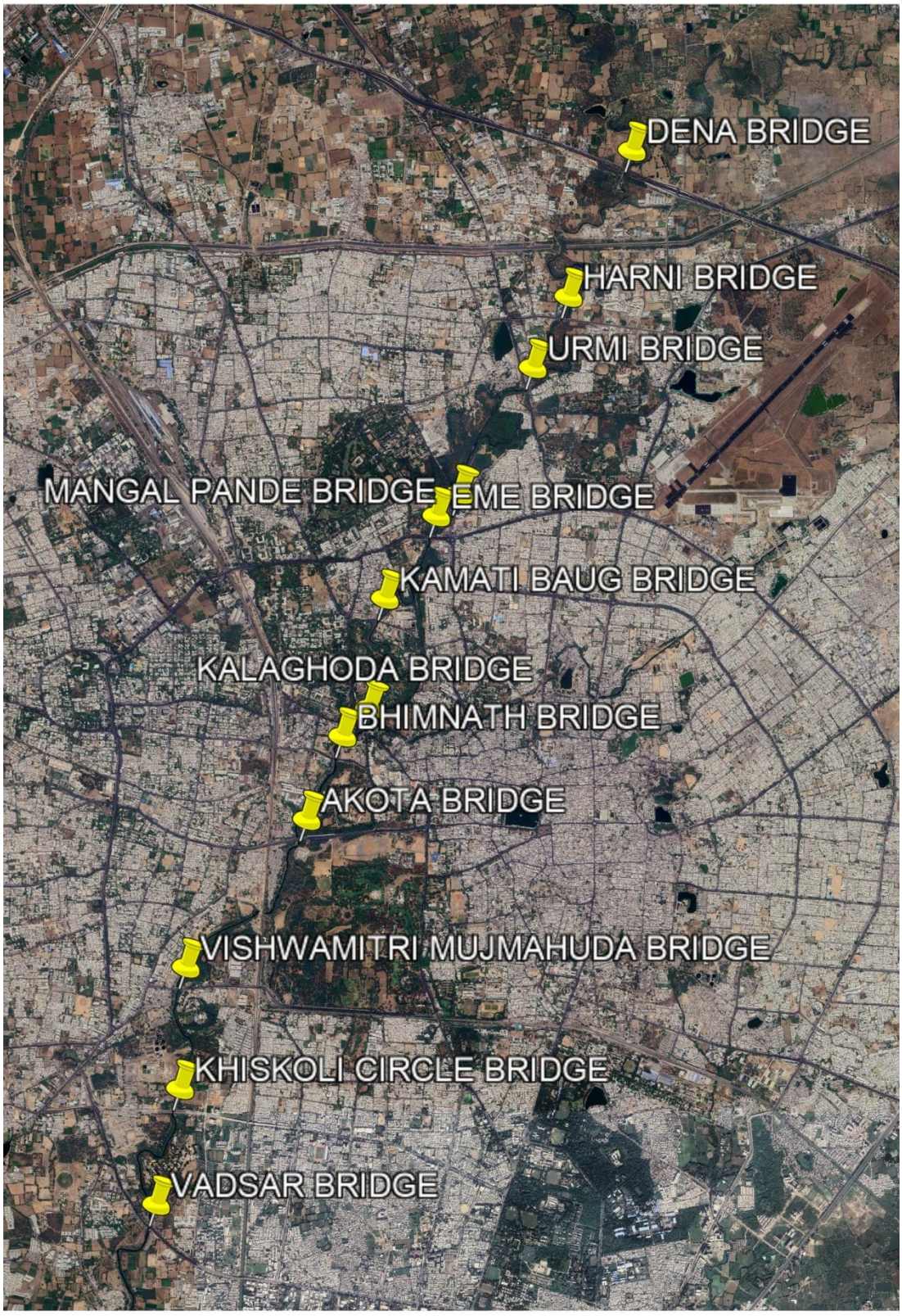
DENA BRIDGE
HARNI BRIDGE
URMI BRIDGE
MANGAL PANDE BRIDGE
EME BRIDGE
KAMATI BAUG BRIDGE
KALAGHODA BRIDGE
BHIMNATH BRIDGE
AKOTA BRIDGE
VISHWAMITRI MUJMAHUDA BRIDGE
KHISKOLI CIRCLE BRIDGE
VADSAR BRIDGE

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TENDER FOR

DESIGNING AND CONSTRUCTION OF GABION WALL AT VARIOUS LOCATION

VOLUME – I TECHNICAL BID

EXECUTIVE ENGINEER
FUTURISTIC PLANNING CELL OFFICE
VADODARA MUNICIPAL CORPORATION

APRIL - 2025

1

NATIONAL COMPETITIVE BIDDING

1. The Vadodara Municipal Corporation invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the following works.

TABLE

Package No.	Name of work	Approximate value of works (Rs.)	Bid security (EMD) (Rs.)	Cost of document	Period of completion	Class of Registration / Category of contractor if required
1	**DESIGNING AND CONSTRUCTION OF GABION WALL AT VARIOUS LOCATION**	Rs. 40,47,34,137/-	Rs.80,94,683/-	Rs. 30,000/-	9 Months	The Contractors must have registration in appropriate class either with VMC, Central/State/PWD/M.E.S./Semi Government or other such institutions for the works

Note: The bidder who fills the tender on N-procure must have valid appropriate class registration. He must apply for the registration in VMC after issue of work order.

(B) SCHEDULE OF TENDERING: -

Sr. No.	Schedule	Time	Date	Place
1.	Downloading of Tender Documents		05.04.2025	The tender document for these works available on website https://tender.nprocure.com.
2A	Submission of Tender documents on n-procure Website	Up to 6:00 pm.	16.04.2025	Volume-I – Volume V shall be submitted on n-Procure Website.
2B	Submission of Tender Document and Prequalification Bid in Hard Copy of Volume-I only, EMD, and Tender Fees (in original) and attested copies of all P.Q. Documents.	Up to 6:00 pm.	17.04.2025	Technical and Prequalification Bid in hard copy (Including Tender Fees, EMD) in separate sealed Envelope –A through RPAD/SPEED Post. Hand delivery OR Courier will not be accepted. Addressed to Executive Engineer, Futuristic Planning Cell Office, Room No. 204, second floor,Vadodara Municipal, Corporation, Khanderao Market Building, Rajmahal Road, Vadodara - 390 001 **(Even if the hardcopy of the tender is reached late due to post department, the tender will not be accepted).**
~~2.~~	~~Pre -Bid Meeting~~	~~11:00 am~~	~~00/00/2025~~	~~Room No. 204, second floor,Vadodara Municipal Corporation, Khanderao Market Building, Rajmahal Road, Vadodara - 390 001.~~

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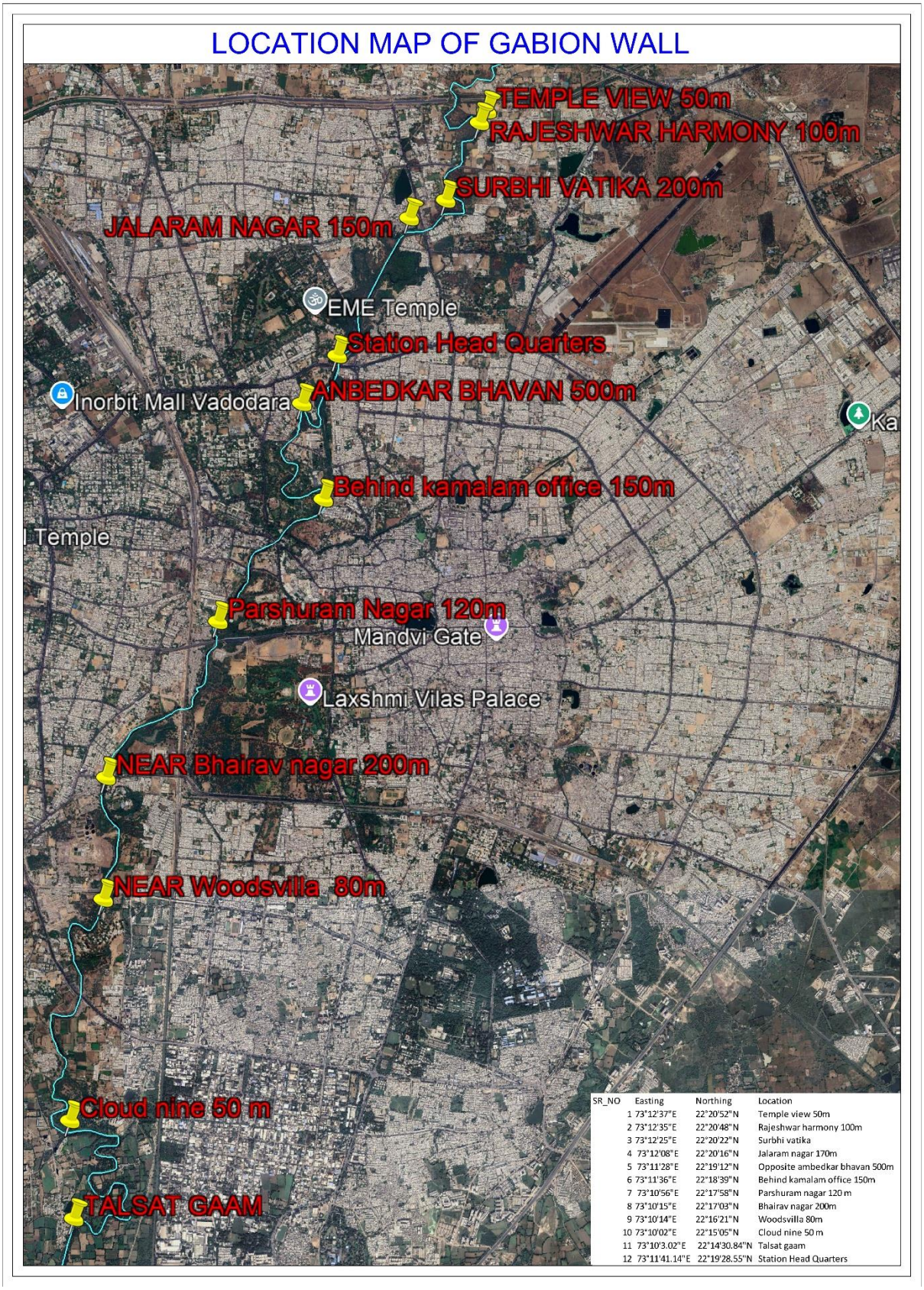


SR_NO	Easting	Northing	Location
1	73°12'37"E	22°20'52"N	Temple view 50m
2	73°12'35"E	22°20'48"N	Rajeshwar harmony 100m
3	73°12'25"E	22°20'22"N	Surbhi vatika
4	73°12'08"E	22°20'16"N	Jalaram nagar 170m
5	73°11'28"E	22°19'12"N	Opposite ambedkar bhavan 500m
6	73°11'36"E	22°18'39"N	Behind kamalam office 150m
7	73°10'56"E	22°17'58"N	Parshuram nagar 120 m
8	73°10'15"E	22°17'03"N	Bhairav nagar 200m
9	73°10'14"E	22°16'21"N	Woodsvilla 80m
10	73°10'02"E	22°15'05"N	Cloud nine 50 m
11	73°10'3.02"E	22°14'30.84"N	Talsat gaam
12	73°11'41.14"E	22°19'28.55"N	Station Head Quarters

Annexure III: Coir Work Documents (Relevant pages)

VADODARA MUNICIPAL CORPORATION

VADODARA MUNICIPAL CORPORATION

TENDER FOR

PROVIDING FIXING LOWERING AND LAYING GEOTEXTILE COIR WOVEN ON BANK OF VISHVAMITRI RIVER AT VADODARA

VOLUME – I TECHNICAL BID

EXECUTIVE ENGINEER
FUTURISTIC PLANNING CELL OFFICE
VADODARA MUNICIPAL CORPORATION

APRIL - 2025

NATIONAL COMPETITIVE BIDDING

1. The Vadodara Municipal Corporation invites bids for the construction of works detailed in the table. The bidders may submit bids for any or all of the following works.

TABLE

Package No.	Name of work	Approximate value of works (Rs.)	Bid security (EMD) (Rs.)	Cost of document	Period of completion	Class of Registration / Category of contractor if required
1	**PROVIDING FIXING LOWERING AND LAYING GEOTEXTILE COIR WOVEN ON BANK OF VISHVAMITRI RIVER AT VADODARA**	Rs. 5,62,35,600/-	Rs.11,24,712/-	Rs. 20,000/-	4 Months	The Contractors must have registration in appropriate class either with VMC, Central/State/PWD/M.E.S./Semi Government or other such institutions for the works

Note: The bidder who fills the tender on N-procure must have valid appropriate class registration. He must apply for the registration in VMC after issue of work order.

VADODARA MUNICIPAL CORPOATION

EXECUTIVE ENGINEER FUTURISTIC PLANNIG CELL OFFICE

WORK :- PROVIDING,FIXING LOWERING AND LAYING GEO TEXTILE COIR WOVEN (700GSM) ON BANK OF VISHWAMITRI RIVER AT.VADODARA

CONTRACTOR :- DINESHCHANDRA R AGRAWAL INFRACON PVT.LTD VADODARA

WORK ORDER DATE :- 13.05.2025

START OF WORK :- 28.05.2025

PRESENT STATUS :- IN PROGRESS

COMPLITED AREA :- 5000(FIVE THOUSAND SQM)

PREPARED AREA :- 2000 (TWO THOUSAND SQM)

LOCATED AREA FOR WORK :- (1)RYTHEM HOSPITAL TO CHETAK BRIGE (RHS/LHS)
(2) MANGAL PANDEY BRIGE TO EME (RHS/LHS)
(3) NARHARI BRIGE TO KALAGHODA (RHS/LHS)

METHODOLOGY
OF COIR WOVEN GEOTEXTILE
NAME OF PROJECT: - Providing, Fixing, Lowering & Laying Geotextile Coir Woven on Bank of Vishwamitri River at Vadodara.
CONTRACTOR:- DINESH CHANDRA R AGRAWAL INFRACON PVT LTD
407 Atlantis Height Near Genda Circle
Vadodara, Gujarat 390007.
Ref.:- Futuristic Planning Cell W.O.No.: 04/25-26
1) Manual slope dressing as per required and specific length and width mark location. Preparation smooth and as per instructed by client.
2) Spread of Geo Fiber marked area.(Per SQM 1 to 1.2 kg)
3) Laying of Coir Wooven Geotextile(700 GSM)
Coir Wooven Goe textile over laping Vertical 200 mm & Horizontal 150 mm
4) Fixing and tie of Geo textile as per required spacing in Staggered.(U clamp And J hook) per Sqm 3 to 4 Nos Spacing 600 to 700 mm
5) Plantation of vetiver grass on top of Coir Woven Geotextile penetrate of bed as per verified spacing and instruction of Engineer In Charge. Regular watering on Top of Coir Woven Geo-Textile. For quick service of vetiver plant. (Per SQMT 12 to 15 Nos) Spacing 300 to 400 mm
6) Preparation of Coir Geo Textile at adjoining of Kans & Nallah Location as per norms & instruction.
7) Preparation of longitudinal and Horizontal End of Coir Geo textile Point as per site condition.
8) Regular watering of Coir Geotextile surface and vetiver plant location.
9) Regular monitoring of working complete location and maintenance as per required activity.

Process Of Work

Vishwamitri River Bank Protection Work

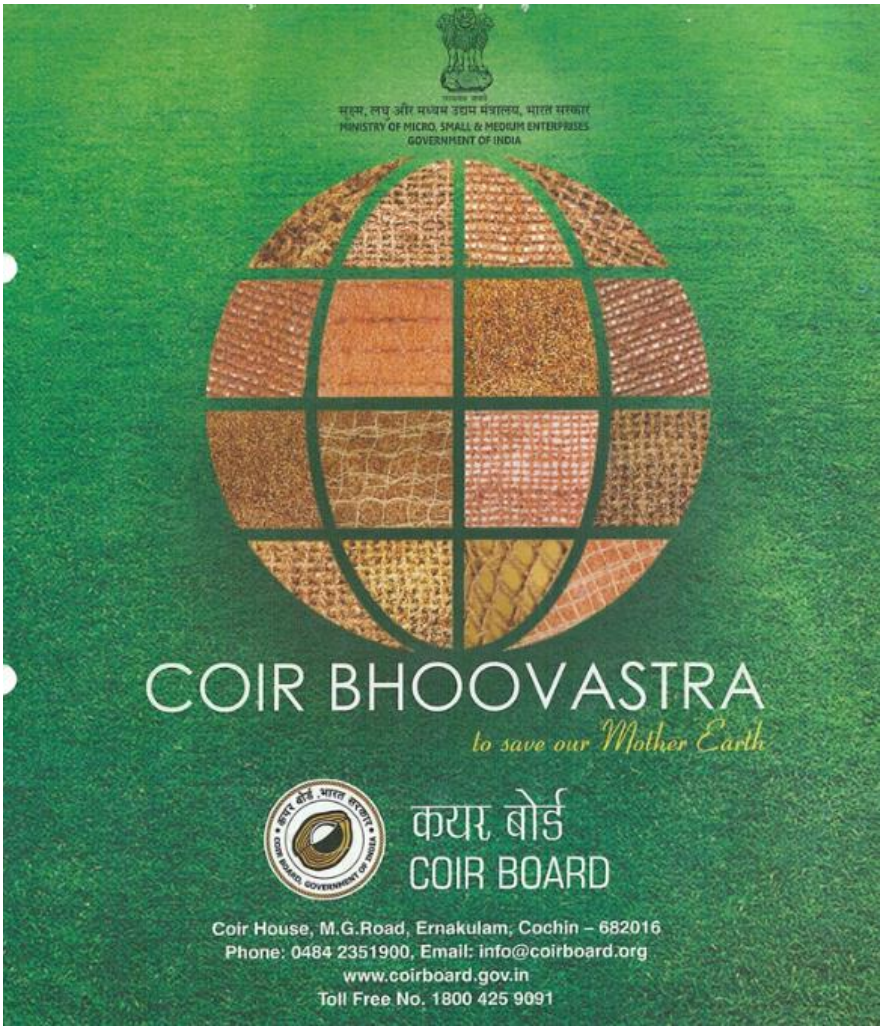
Step 1. Preparation Of Soil Bank Bed And Trenching On Top , Bottom And Both End Of Protection Edge.

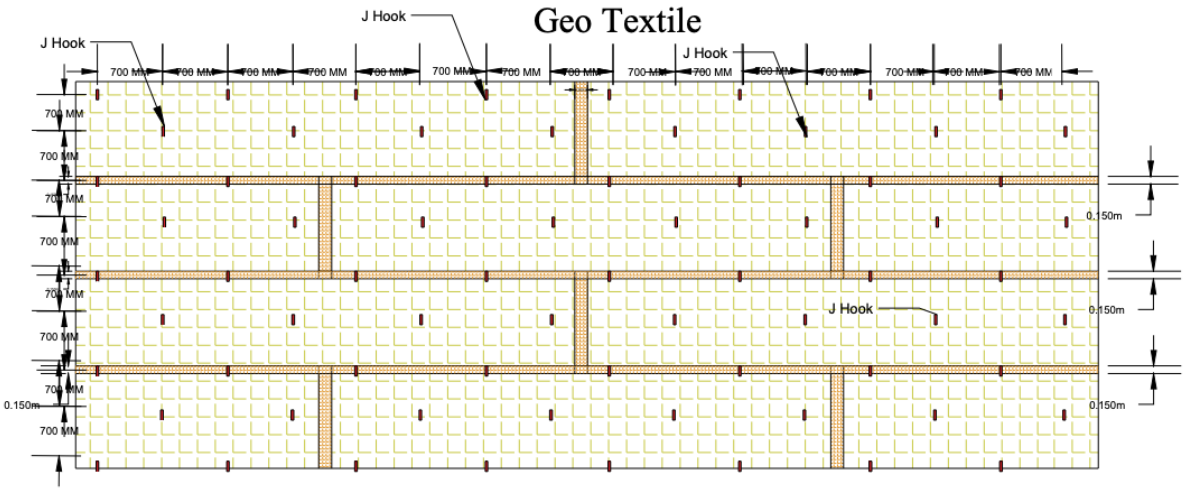
Step 2. Laying Of Loose Coir Fiber As Per Located Area Of Coir Woven Geo Textile (700gsm) 1 To 1.25 Kg Per Sqm.

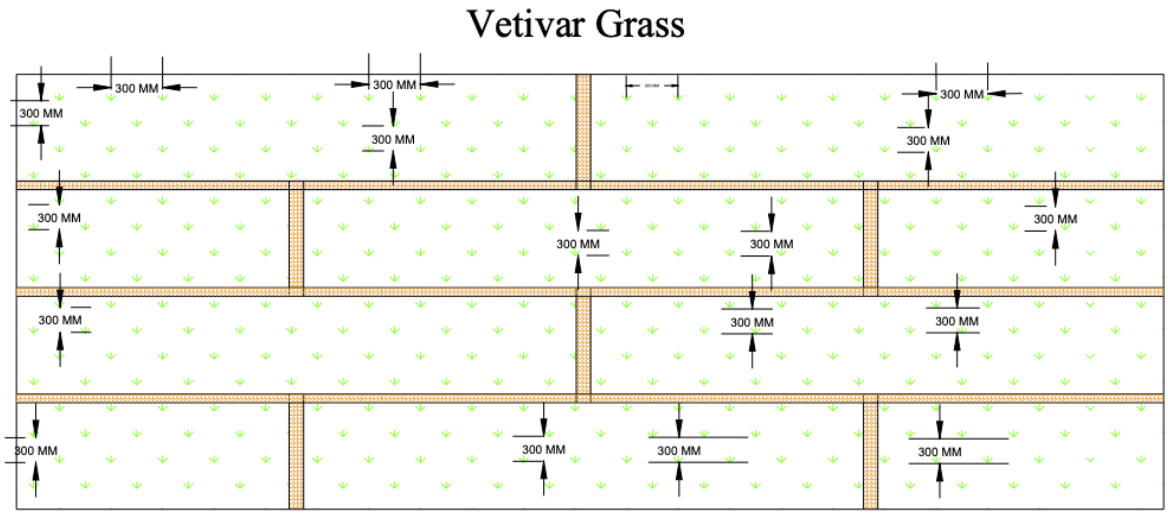
Step 3. Laying Of Coir Woven Geotextile (700gsm) As Per Fixing Stitching Arrange With 'J' Hook And 'U' Hook 700mm C/C Staggered.

Step 4. Plantation Of Vetiver Grass Plant As Per Required Spacing 300mm C/C Staggered.

Step 5. Regular Monitoring Of All Work Maintain i.e Watering Vetiver Plant, Geo-Textile, Rain Cut, Etc.




Geo Textile
J Hook
J Hook
J Hook
J Hook
700 MM
0.150m
0.150m
0.150m
0.150m


Vetivar Grass
300 MM

Annexure IV: Plantation Data from Parks & Gardens Department, VMC

Jo 2389/e-Appal/08/2025

વડોદરા મહાનગરપાલિકા
પાર્કસ એન્ડ ગાર્ડન શાખા,
સયાજીબાગ, વડોદરા.

ફોન- ૦૨૬૫-૨૭૯૪૧૭૦
Email:directorparks@vmc.gov.in

વી.એમ.સી./ડી.પી.છ./જા.નં./૧૩૫૨/૨૦૨૫-૨૬
તા.૦૬/૦૭/૨૦૨૫

પ્રતિ,
કાર્યપાલક ઇજનેરશ્રી,
વિશ્વામીત્રી પ્રોજેક્ટ,
ખંડેરાવ માર્કેટ,
વડોદરા મહાનગરપાલિકા

વિષય :- માનવ અધિકાર આયોગ દ્વારા નિમવામાં આવેલ સમિતિને માહિતી આપવા બાબત.

સંદર્ભ:- ડ્રેનેજ વરસાદી ગટર પ્રોજેક્ટ શાખા જાવક નંબર -૧૩૯૮/૨૦૨૫ તા.૨૪/૦૩/૨૦૨૫

ઉપરોકત વિષય અનુસંધાન લખી જણાવવાનું કે આપના દ્વારા આવેલ પત્ર સંદર્ભે વિશ્વામિત્રી ઉપર કરવામાં આવેલ પ્લાન્ટેશન તેમજ આયોજન હાથ ધરેલ છે જેનું લિસ્ટ નીચે મુજબ છે. જે જાણમાં લેવા સારું.

વિશ્વામિત્રી પર કરવામાં આવેલ પ્લાન્ટેશનની વિગત

૧) વિશ્વામિત્રી પર બન્ને સાઈડ ટ્રી ગાર્ડ સાથે પ્લાન્ટેશન કરવાનું કામ ૪૦૦૦-નંગ પ્લાન્ટેશન કરેલ છે જેની ૩ વર્ષ માટે ઝાડ તેમજ ટ્રી ગાર્ડ સાથે નિભાવણી તેમજ ૧૦૦ % મોર્ટાલીટી રીપ્લેસમેન્ટ પણ કરવામાં આવશે અને આ ઉપરાંત સપ્ટેમ્બર પછી પણ પ્લાન્ટેશન કરવાનું આયોજન કરેલ છે.

૨) મંગલ પાંડે બ્રિજ પાસે - (Riverview part-1 & 2)

૩) મંગલ પાંડે બ્રિજ થી ઇ.એમ.ઇ. બ્રીજ સુધી નદી કિનારાના છોડ પ્લાન્ટેશન - ડેવલપમેન્ટ કરવાનું કામ.

૪) વેમાલી પાસે આવેલ પ્લોટનું આયોજન - ડેવલપ કરવાનું.

૫) દેના તળાવ પાસે આવેલ પ્લોટનું આયોજન - બોર્ડર પ્લાન્ટેશન કરવાનું આયોજન.

૬) વડસર લેન્ડફિલ ની સામે આવેલ પ્લોટનું આયોજન.

૭) વિશ્વામિત્રી નદીની બન્ને સાઇડના ભાગમાં Branching Palm (રાવણ તાડ) હાલમાં ૪૦૦ નંગ જેવા બીજનું પ્લાન્ટેશન કરવામાં આવેલ છે તેમજ borassus flabellifer (Palmyra Palm) અને Bamboo પ્લાન્ટેશન કરવાનું આયોજન હાથ ધરેલ છે.

ડાયરેકટર
પાર્કસ એન્ડ ગાર્ડન

ડ્રેનેજ વ. ગટર પ્રોજેક્ટ
આ.નં. 3940
તા. 07/08/25
વડોદરા મહાનગરપાલિકા, વડોદરા

Vishwamitri River Conservation Plantation Report

Vadodara Municipal Corporation – Parks & Garden Department

1. Introduction: Ecological Restoration Initiative

The Vishwamitri River, a lifeline for Vadodara's natural ecosystem, plays a crucial role in supporting biodiversity, groundwater recharge, and ecological balance. Recognizing the urgent need to protect and rejuvenate this natural asset, the Vadodara Municipal Corporation (VMC) has launched a conservation-driven plantation initiative. This project is designed to restore native vegetation, stabilize riverbanks, and foster long-term environmental sustainability along the Vishwamitri corridor.

2. Conservation-Based Plantation Strategy

2.1 Ecological Zone Coverage

- Plantation is being undertaken along both riverbanks of the Vishwamitri River, utilizing available upper bank lands and marginal spaces.
- Priority areas include degraded riverbanks, erosion-prone zones, and stretches with potential for ecological enrichment.
- Trees are being planted in single or double linear formations, maintaining a minimum 3-meter spacing to ensure optimal growth and canopy development.

2.2 Ongoing Conservation Efforts

- Over 4,000 native and riparian trees have already been planted, secured with tree guards and a 3-year post-plantation maintenance plan.
- Plantation stretches include:
  - Mangal Pandey Bridge to Dena Highway
  - Mangal Pandey to Mujmahuda Bridge
  - Vadsar Landfill Site to Talsat Village

3. Species Diversity and Habitat Restoration

3.1 Native and Riparian Tree Species

Selected tree species support riparian biodiversity, offer natural habitat, and stabilize soil structure along riverbanks. Examples include:

- Neem, Indrajiv, Pipal, Umaro,Khaya, Arjun, Sisham
- Rare and riverine species like Karvi, Lal Dhau (Tamarix dioica), Elephant Grass, and

Red/Yellow Silk Cotton Trees
- Ethnobotanical and wildlife-supporting species such as Agastya, Paras Ravan, Jungali Badam, Kadam.

3.2 Special Biodiversity Enrichment Species

- Ravan Tad Palm (Hyphaene dichotoma) and Palmyra Palm (Borassus flabellifer) are being introduced to enhance native palm diversity and habitat complexity.
- 400 Ravan Tad seeds have already been planted; future targets include 5,000–7,000 seeds/plants.
- Bamboo plantations are also planned in suitable moist zones to support bank stabilization and faunal shelter.

4. Eco-Beautification Zones

Eco-beautification integrates aesthetics with ecology, ensuring that human interaction zones also support native flora and fauna.

Key locations:
- Dena Lake
- Vemali (adjacent to Regional Science Museum)
- Ratri Bazaar River View Park 1 & 2 (Mangal Pandey)
- Opposite Chhaya Farm, Vadsar Bridge

These locations incorporate riparian sapling zones, view corridors, and native canopy development to blend conservation with public access.

5. Conclusion: Towards a Resilient River Ecosystem

The Vishwamitri Plantation Conservation Initiative stands as a model for urban ecological restoration. Its objectives are:
- Restoring native green cover
- Preventing riverbank erosion
- Enhancing urban biodiversity
- Improving microclimate and water retention
- Fostering community stewardship of natural assets

Through scientific planning and sustained efforts, VMC envisions a revitalized Vishwamitri River that thrives as both an ecological haven and a public green space.

Sr. no.	Species name	Qty.	Section						
			Mangal pandey to Dena chokadi	Dena chokadi to Mangal pandey	EME bridge to Sayaji hotel	Sayaji hotel to Mangal pandey bridge	Sayaji hotel to Mujmahuda bridge	Mujmahuda bridge to Sayaji hotel	Vadsar bridge to Kalali smashan
1	Garmalo	343	80	76	57	62	28	28	12
2	Sisam	331	80	76	57	62	28	28	0
3	Umaro	331	80	76	57	62	28	28	0
4	Pipal	343	80	76	57	62	28	28	12
5	Ravana	331	80	76	57	62	28	28	0
6	Karanj	343	80	76	57	62	28	28	12
7	Limda	224	80	76	0	0	28	28	12
8	Khaya	343	80	76	57	62	28	28	12
9	Kadam	346	80	76	57	62	28	28	15
10	Arjun	343	80	76	57	62	28	28	12
11	Ambali	343	80	76	57	62	28	28	12
12	Jambu	225	80	76	57	0	0	0	12
13	Jungali Badam	189	89	88	0	0	0	0	12
14	Shimalo Red	175	0	0	57	62	28	28	0
15	Shimalo Yellow	187	0	0	61	66	30	30	0
	Total	**4397**	**1049**	**1000**	**745**	**748**	**366**	**366**	**123**

Annexure V: Report by NHSRCL (Bullet Train) (Relevant pages)

STATUS AS ON 05.07.25

Sr. no.	MAHSR Pier ID @ Vishwamitri River	Type of Crossing	Status of removal of obstructions as on 28.06.25	Remarks
1	376P21-P22	River Crossing	Completed	Completed
2	380P08-P09	River Crossing	~~15-06-2025~~ ~~05-07-2025~~ 15-07-2025	No Obstruction of water & water already overflowing. RCC Pipe removal will be done once the water level subsides and removal of machineries.
3	380P15-P16	River Crossing	Completed	Completed
4	386P01-P02	River Crossing	~~15-06-2025~~ ~~05-07-2025~~ 15-07-2025	No Obstruction of water & water already overflowing. RCC Pipe removal will be done once the water level subsides and completion of Piercap 386P02.
5	387P08-P09	River Crossing	Completed	Completed
6	388P01-P02	River Crossing	Completed	Completed
7	388P05-P06	River Crossing	Completed	Completed
8	388P10-P11	River Crossing	Completed	Completed


380P08
380P09


380P14
380P15
380P16
380P99


386P02
386P01


387P07
387P08
387P09

LARSEN & TOUBRO

Larsen & Toubro Limited
Construction
Heavy Civil Infrastructure
MAHSR – C4, Swastik Universal,
Unit No. 201, 2nd Floor Building No. B,
Rundh Village, Piplod – Dumas Road,
Surat, Gujarat – 395007, India

Ref. No: LTC/MAHSR/Pkg-C4/CAM/2025/14627 **17th June 2025**

To,
The Engineer,
TCEL-CEGL-AARVEE ASSOCIATES-PADECO JV,
B-1007 to 1012, 10th Floor, Tower B, Swastik Universal,
Opp. Central Mall, Dumas Road, New Magdalla,
Surat, Gujrat – 395007, India
Email id: s.sreedharan@tcappmc.in

Kind Attn.: Mr. S Sreedharan, Engineer's Representative

SUB: **C4 Package** - Design and Construction of 237 km long Viaduct (Ch. 156.6 - 393.7) including 4 stations (Vapi, Bilimora, Surat, Bharuch) & Surat Depot for MAHSR Project.

Reg: Grievance of Executive Engineer, Vishwamitri Project, Vadodara Municipal Corporation towards removal of Encroachment on Vishwamitri

Ref:

i) LOA No. NHSRCL-CO/MA/CA/01/PACKAGE-C4/6/.2/OHQ975; Dated: 28.10.2020
ii) NHSRCL/ST/MA/04/C4 Package: SVGC/85/.1/OST-6997; Dated: 13.06.2025
iii) LTC/MAHSR/Pkg-C4/CAM/2025/14616; Dated: 16.06.2025
iv) TCAP/MAHSR/PMC/C4/2025/SHE/8200; Dated: 16.06.2025

Dear Sir,

This letter addresses the concerns raised by the stakeholders (Executive Engineer, Vishwamitri Project – VMC), as communicated through the Employer/Engineer's letters under reference (ii) and (iv). The updated status of the obstruction mentioned in EE letter is as below:

Sl no	Locations	Contractor response
1	Encroachment (22.2261286,73.1663251)	The location is meandering with no obstruction to the river flow
2	Encroachment (22.2308678, 73.1694797)	Obstruction removed
3	Encroachment (22.2319190, 73.1700638)	Obstruction removed
4	Encroachment (22.2321893, 73.1701764)	Obstruction removed
5	Encroachment (22.2334921, 73.1709771)	Obstruction removed
6	Encroachment (22.2334149, 73.1709600)	Obstruction removed
7	Encroachment (22.2338304, 73.1710622)	Obstruction removed
8	Akota Bridge Encroachment (22.2923162, 73.1792266)	Not in C4 scope

Further, the Contractor has submitted a detailed status report on the Vishwamitri river crossing, which falls under MAHR C4 jurisdiction, via our letter under reference (iii). We would like to further inform you that the desilting and bank stabilization works have only been affected for approximately **1.2 kilometers**, encompassing **8 river crossings** and **5 meandering locations**.

Please be advised that the restoration of the banks to their original condition can be effectively completed following the conclusion of the MAHSR pier construction.

L&T CONSTRUCTION MAHSR C4 Package Surat

Tel: +91 44 3319 2000, 3319 3000 Fax: +91 44 3319 2950 / 8811 www.lntecc.com
Registered Office: L&T House, N. M. Marg, Ballard Estate, Mumbai – 400 001 – INDIA
L&T Construction – Heavy Civil Infrastructure is a brand of Larsen & Toubro Limited
CIN : L99999MH1946PLC004768

LARSEN & TOUBRO

Larsen & Toubro Limited
Construction
Heavy Civil Infrastructure
MAHSR – C4, Swastik Universal,
Unit No. 201, 2nd Floor Building No. B,
Rundh Village, Piplod – Dumas Road,
Surat, Gujarat – 395007, India

Ref. No: LTC/MAHSR/Pkg-C4/CAM/2025/14627 **17th June 2025**

This letter is issued without prejudice to the Contractor's rights under the subject Contract Agreement and Governing Laws.

Thanking you and assuring our best services at all the times.

Yours faithfully,

For **Larsen & Toubro Limited**

L&T CONSTRUCTION MAHSR C4 Package Surat

(G. Vinod)
Task Force Leader

Copy:

1. The Employer (Mr. Benny P.T., Principal Chief Project Manager / Surat, NHSRCL)

Sec 5/ALP/SKG

LARSEN & TOUBRO

Larsen & Toubro Limited
Construction
Heavy Civil Infrastructure
MAHSR – C4, Swastik Universal,
Unit No. 201, 2nd Floor Building No. B,
Rundh Village, Piplod – Dumas Road,
Surat, Gujarat – 395007, India

Ref. No: LTC/MAHSR/Pkg-C4/GEN/2025/14658 **23rd June 2025**

To,
The Engineer,
TCEL-CEGL-AARVEE ASSOCIATES-PADECO JV,
B-1007 to 1012, 10th Floor, Tower B,
Swastik Universal, Opp. Central Mall,
Dumas Road, New Magdalla, Piplod,
Surat, Gujarat – 395007, India -Email id: s.sreedharan@tcappmc.in

Kind Attn.: Mr. S Sreedharan, Engineer's Representative

SUB: C4 Package - Design and Construction of 237 km long Viaduct (Ch. 156.6 - 393.7) including 4 stations (Vapi, Bilimora, Surat, Bharuch) & Surat Depot for MAHSR Project

Reg.: Removal of Encroachments in Vishwamitri River

Ref:

1. LOA No.: NHSRCL-CO/MA/CA/01/PACKAGE-C4/6/.2/OHQ975 dt. 28-10-2020.
2. Commencement dt. 10-12-2020
3. NHSRCL/Vadodara/URN:03-15733; dt. 01-04-2025
4. LNT/HCIC/MAHSR/C4/FA&A/Sec5-46; dt. 04-04-2025
5. TCAP/MAHSR/PMC/C4/2025/SHE/7798; dt 09-04-2025
6. NHSRCL/Vadodara/URN:03-15832; dt. 23-04-2025
7. LTC/MAHSR/Pkg-C4/CAM/2025/14339; dt. 10-052025
8. Letter from Collector and District Magistrate's Office (Gujarat State Disaster Management Department), Vadodara; dt.12-05-2025
9. TCAP/MAHSR/PMC/C4/2025/CON/8060; dt. 24-05-2025
10. LTC/MAHSR/Pkg-C4/CAM/2025/14472; dt. 28-05-2025
11. VMC City Engineer meeting dt. 03-06-2025
12. Email from VIC dt. 04-06-2025
13. TCAP/MAHSR/PMC/C4/2025/SHE/8155 Dt. 10-06-2025
14. LTC/MAHSR/Pkg-C4/GEN/2025/14630; Dated: 17.06.2025
15. O.N./VID/PB-1/Vishwamitri/1599/2025; Dated: 18.06.2025
16. TCAP/MAHSR/PMC/C4/2025/CON/8224; Dated: 19.06.2025

Dear Sir,

With reference to the subject matter, the Engineer's letter under ref. (16) and in continuation to the Contractor's letter under ref. (14), the Contractor provides the following update:

1. The Contractor would like to inform that out of the seven river locations mentioned in the Vadodara Irrigation Division letter under ref. (15), **three locations have been cleared, two locations are having meandering nature** and do not obstruct the current water flow.
2. Furthermore, the Contractor has already started removing temporary crossing/structures for the balance two location.

The Contractor hereby provides the location wise status as below.

L&T CONSTRUCTION MAHSR C4 Package Surat

Tel: +91 44 3319 2000, 3319 3000 Fax: +91 44 3319 2950 / 8811 www.lntecc.com
Registered Office: L&T House, N. M. Marg, Ballard Estate, Mumbai – 400 001 – INDIA
L&T Construction – Heavy Civil Infrastructure is a brand of Larsen & Toubro Limited
CIN : L99999MH1946PLC004768

LARSEN & TOUBRO

Larsen & Toubro Limited
Construction
Heavy Civil Infrastructure
MAHSR – C4, Swastik Universal,
Unit No. 201, 2nd Floor Building No. B,
Rundh Village, Piplod – Dumas Road,
Surat, Gujarat – 395007, India

Ref. No: LTC/MAHSR/Pkg-C4/GEN/2025/14658

23rd June 2025

Bullet Train crossing on Vishwamitri River (as per VMC letter)					Remarks by L&T	
Sr no	**Department**	**Co-ordinate**	**Village**	**Status**	**Chainage**	**Remarks**
1	Irrigation	22.224866,73.165559	Maretha	Removed	387P08-387P09	Removed.
2	Irrigation	22.125500,73.093100	Chansad	Pending	386P01-386P02	Removal in progress. But water already overflowing without obstruction.
3	Irrigation	22.215433,73.158696	Chansad	Pending	385P23-385P24	Meandering portion, no obstruction of flow.
4	Irrigation	21.199394,73.160235	Shihor	Pending	380P15-380P16	Only sheet piles not removed. Water already flowing without obstruction.
5	Irrigation	22.173945,73.129702	Shihor	Pending	380P08-380P09	Removal in Progress.
6	Irrigation	22.172019,73.128896	Thikariya Mubarak	Pending	379P04-379P09	Meandering portion, no obstruction of flow.
7	Irrigation	22.145468,73.110404	Thikariya Mubarak	Removed	376P21-376P22	Removed.

The letter is issued without prejudice to the Contractor's rights under the subject Contract Agreement and Governing Law.

Thanking you and assuring our best services at all the times.

Yours faithfully,
For **Larsen & Toubro Limited**

L&T CONSTRUCTION MAHSR C4 Package Surat

(G. Vinod)
Task Force Leader

Copy: The Employer (Mr. Benny P T, Principal Chief Project Manager/ Surat, NHSRCL)
CSK/ALP

Page **2** of **2**

TCAP
MAHSR PMC Civil

TCAP/MAHSR/PMC/C4/2025/SHE/8273 01-07-2025

National High Speed Rail Corporation Limited,
1001-1006, 10th Floor, Swastik Universal,
Opposite Central Shopping Mall, Piplod, Rundh,
Surat Magdalla Road, Surat 395007, India
Email: cpm.surat@nhsrcl.in

Kind Attention: Mr. Benny P.T., PCPM/Surat/NHSRCL

Project **C4 Package** - Design and Construction of 237 kms long viaduct (Ch.156.600 to 393.700) including 04 Stations (Vapi, Bilimora, Surat, Bharuch) & Surat Depot for MAHSR Project

Subject Grievance of Executive Engineer, Vishwamitri Project, Vadodara Municipal Corporation towards removal of Encroachment on Vishwamitri river

Reference:

01. LOA No.: NHSRCL-CO/MA/CA/01/PACKAGE-C4/6/.2/OHQ975 dt. 28-10-2020
02. Commencement dt. 10-12-2020
03. VMC letter no. 778/3/6/25 dated 03.06.2025
04. NHSRCL/BRC/MA/03/MAHSR-C5correspondence/413/.1/OBRC8305 dated.10.06. 2025
05. NHSRCL(ST)/MA/04/C4 Package: SVGC/85/.1/OST-6997 dated. 13.06.2025
06. LTC/MAHSR/Pkg-C4/CAM/2025/14616, dated. 16.06.2025
07. TCAP/MAHSR/PMC/C4/2025/SHE/8200 dated. 16.06.2025
08. LTC/MAHSR/Pkg-C4/CAM/2025/14627 dated. 17.06.2025

Dear Sir,

The contractor has submitted the compliance report, referenced as 08 (enclosed), in response to the grievance raised by the Executive Engineer, Vishwamitri Project, Vadodara Municipal Corporation (VMC) duly forwarded by the Employer vide letter referenced in 05.

The submission of the contractor has been verified by the Engineer at the site and confirmed that the encroachments have been successfully removed from the river area except damaged hume pipes on the bank of river at Ch.388 (P21-22). A copy of the site verification and compliance documentation is attached herewith as Annexure 1 along with contractor's compliance for your reference and records.

TCAP
MAHSR PMC Civil

TCAP/MAHSR/PMC/C4/2025/SHE/8273 01-07-2025

Thanking you and assuring you the best of services always,

Very truly yours,
for & on behalf of TCAP Consortium

Bhudev Sharma
Deputy Project Director
TCAP, MAHSR PMC - Civil

Chandra Narayan Tiwari
Chief Resident Engineer - Surat
TCAP, MAHSR PMC - Civil

VLS / / RIS

Encl.: Annexure 1
CC: Project Director, TCAP, Surat

Annexure VI: Hydraulic Modelling-Based Evaluation by SECON (Relevant pages)

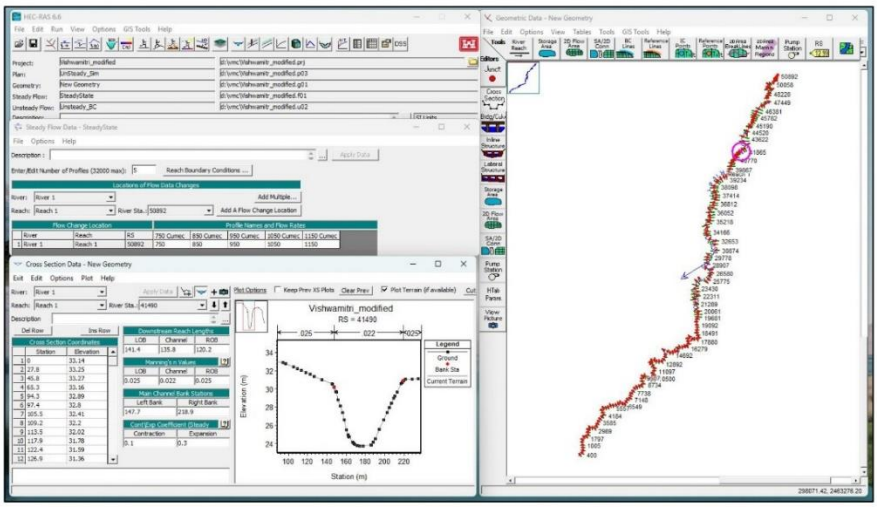
Hydraulic Modeling-Based Evaluation of Channel Capacity Improvement in Vishwamitri River Post-Dredging

(HEC-RAS 1D Hydraulic Model for Vishwamitri River (VMC Reach)

Introduction

A 1D hydraulic model was developed in HEC-RAS for the Vishwamitri River, covering the reach from the VMC entry point to Pingalwada Junction. The primary objective of this modeling effort was to assess the carrying capacity of the river through VMC limits, specifically from the NH-08 Bridge up to Kalali Mandir, following on-ground channel modification works.

The model setup, including geometric inputs and boundary conditions, is illustrated in Figure 1.



Simulation Details

Five discharge scenarios were simulated to analyze the river's hydraulic response:

i. 750 cumecs
ii. 850 cumecs
iii. 950 cumecs
iv. 1050 cumecs
v. 1150 cumecs

For each scenario, the maximum water surface elevations were computed along the reach. The results provide a clear understanding of the river's capacity under increasing flow conditions.

Results and Observations

The hydraulic modeling results clearly demonstrate that dredging of Vishwamitri has led to a notable improvement in the carrying capacity of the Vishwamitri River within the VMC stretch maximum upto 1150 cumecs.

1

Annexure VII: Brief Action Taken Report on NH-48 Drain Cleaning Work in Vadodara (Relevant pages)

NATIONAL HIGHWAYS AUTHORITY OF INDIA
Project Implementation Unit (PIU)-Godhra

Brief Action Taken Report on issue of Obstruction to Dhadhar River Flow at Sadar Village, Padra Taluka, Vadodara District

1. The Dhadhar River intersects National Expressway-4 (Vadodara-Mumbai Expressway) at Ch. 336+800 near Sadar village, Padra Taluka, Vadodara, where a Major Bridge has been provided by NHAI for uninterrupted crossing of the natural river flow.

2. Upon receiving a letter from the Vadodara Irrigation Division regarding removal of obstruction within the Dhadhar River bed as part of disaster management mitigation works, NHAI and its Contractor initiated action.

3. It is pertinent to mention that the NHAI's Expressway design incorporates adequate cross-drainage structures (Major Bridges, Minor Bridges, Box Culverts) at approx. 500 m intervals, thereby ensuring natural drainage continuity and avoiding obstruction of water flow.

4. However, during review of the issue, it has come to notice of NHAI that Several attempts were made in the past on multiple occasions to remove this temporary obstruction. However, the local villagers and Gram Panchayat resisted removal.

5. **Action Taken by NHAI:**
   - A **site visit and meeting** was conducted with the **Sarpanch of Sadar Gram Panchayat** at the said location regarding removal and cleaning of debris.
   - It was conveyed by the villagers, and also communicated vide their letter dated 07.06.2025 (letter attached), that stones, soil, and other materials had been placed by them along the bund/periphery to prevent erosion during monsoon flows and to protect the village approaches.
   - The villagers further conveyed that:
     - The bund/periphery erodes every year due to direct river flow.
     - Agricultural land lies across the river, for which a temporary pathway of stones and pipes was created to facilitate daily crossing.
     - A representation has already been submitted to the State Government for a permanent concrete bridge as a long-term solution.

6. Multiple correspondences between NHAI, Irrigation Dept., Contractor, and Independent Engineer emphasized the urgency of removing the obstruction before monsoon to avoid disaster management risks.

7. Therefore, **on 17.06.2025**, obstruction has been removed in the presence of officers of the irrigation department as per their directions and to their satisfaction.

8. The Layout representation of obstruction is attached below. Before & After Photographs of the successful obstruction removal work are attached below.

"વિના સહકાર નહિ ઉદ્ધાર"

સાદડ ગ્રામ પંચાયત

સરપંચશ્રી: કંચનભાઈ જશભાઈ ગોહીલ મો:૭૯૮૪૨૪૭૬૦૩

મુ.પો. સાદડ, તા. પાદરા, જી. વડોદરા.

જાવક નં. ૩૧૩ તા. ૦૭/૦૬/૨૦૨૫

પ્રોજેક્ટ ડિરેક્ટર
એન.એચ.એ.આઇ. ગોધરા

વિષય :- ગામ- સાદડ ની સીમમાં વિશ્વામૈત્રી નદી ને કારણે ગામની જમીન નું ધોવાણ થતું અટકાવવા માટે અમારા દ્વારા

એકઠું કરવામાં આવેલ મટિરિયલ ન હટાવવા બાબત.

શ્રીમાન,

જય ભારત સહ આપ સાહેબશ્રી ને જણાવવાનું કે મળેલ માહિતી અનુસાર આપના આદેશ અનુસાર તા.૦૬.૦૬.૨૦૨૫ ના નેશનલ એક્સપ્રેસ હાઇવે નિર્માણકર્તા કંપની દ્વારા ઉપરોક્ત વિષયાનુસંધાન વિશ્વામૈત્રી નદીના કિનારે પડેલ પત્થર તેમજ અન્ય મટિરિયલ હટાવવા હેતુ મશીનરી તેમજ કંપની ના અધિકારી સાઈડ ઉપર આવેલ જેમના દ્વારા પત્થર તેમજ અન્ય મટિરિયલ હટાવવા કામગીરી કરવાનું જણાવેલ.

હું કંચનભાઈ જશભાઈ ગોહિલ સરપંચ સાદડ ગામ ના પ્રતિનિધિ તરીકે અમારો પક્ષ આપની સમક્ષ મૂકી રહ્યો છું. અમારા ગામના લોકોનો મુખત્વે ધંધો ખેતીવાડી હેવાથી તેમનું ગુજરાન ખેતી ઉપર આધારિત છે તેમજ વિશ્વામૈત્રી નદી અમારા ગામની સીમ માંથી પ્રસાર થતી હોવાથી દર વર્ષે ચોમાસામાં આમરા ગામની ખાતેદારી ની જમીન તેમજ આવવા જવા માટે ના રસ્તાનું નું ધોવાણ થતું રહે છે દિવસે ને દિવસે અમારી જમીન કપાત થતી રહે છે. નેશનલ એક્સપ્રેસ હાઇવે નજીક તેમજ વિશ્વામૈત્રી નદીના બંને બાજુએ અમારા ગ્રામવાસીઓ ની ખેતીની જમીન આવેલ છે તે મને ખેતી માટે અવાર-નવાર નદીને પ્રસાર કરી બીજા છેડે ખેતી માટે જવાનું હોવાથી ગ્રામવાસીઓ ના ખર્ચે અમારા દ્વારા પ્રાથમિક નિવારણ હેતુ પત્થર તેમજ અન્ય મટિરિયલ લાવી ને ત્યાં નદીના કિનારે રાખવામાં આવેલ છે જેના કારણે અમારા ગામનો આવવા જવાના રસ્તાનું ધોવાણ અટકાવી શકાય. તેમજ વિશ્વામૈત્રી નદીની ઉપર અમારા દ્વારા પત્થર તેમજ પાઇપ (નાળા) નાખી પ્રાથમિક રસ્તો બાનાવેલ જેના થકી ગ્રામજનો ખેતી માટે નદીના આ છેડે થી બીજા છેડે જઈ શકે.

(૨)

"વિના સહકાર નહિ ઉદ્ધાર"

સાદડ ગ્રામ પંચાયત

સરપંચશ્રીઃ કંચનભાઈ જશભાઈ ગોહીલ મો:૭૯...

મુ.પો. સાદડ, તા. પાદરા, જી. વડોદરા.

જાવક નં. તા.

પ્રતિ શ્રી,

ગત વર્ષ વડોદરા જિલ્લા માં પૂરની પરિસ્થિતી ને કારણે અતિશય પાણીની આવક વિશ્વામૈત્રી નદીમાં થવાના કારણે અમારા દ્વારા બનાવેલ પ્રાથમિક માર્ગ ને નુકસાન થયેલ જેના કારણે અમારા ગ્રામજનો ખેતી પણ

કરી શક્ય ન હોતા જેથી આર્થિક નુકસાની ભોગવવી પડેલ. ઉપરોક્ત પ્રાથમિક માર્ગ ને ગુજરાત સરકાર દ્વારા કાયમી ધોરણે નિરાકરણ લાવવા હેતુ ત્યાં પાકા પુલ ની માંગ અમારા દ્વારા એમ.એલ.એ સાહેબશ્રી, સાંસદ સભ્ય સાહેબશ્રી ને કરેલ છે તથા તેમજા મધ્યમ થકી મુખ્યમંત્રીશ્રી ગુજરાત રાજ્ય સુધી રજૂઆત કરવામાં આવેલ છે જેનું નિરાકરણ હજૂસુધી થયેલ નથી જેથી કરીને

હું સપંચ સાદડ ગ્રામજનો ના પ્રતિનિધિ તરીકે આપ સાહેબશ્રી ને વિશ્વામૈત્રી નદીના કિનારે પડેલ પત્થર તેમજ અન્ય મટિરિયલ ન હટાવવા આપશ્રી ને નિવેદન કરૂં છું.

આપ સાહેબશ્રી મધ્યમથી પણ ગુજરાત રાજ્ય સરકાર ને કાયમી ધોરણે નિરાકરણ લાવવા હેતુ ત્યાં પાકા પુલ ની અમારી માંગ ની રજૂઆત કરવામાં આવે તે માટે આપશ્રી ને વિનંતી.

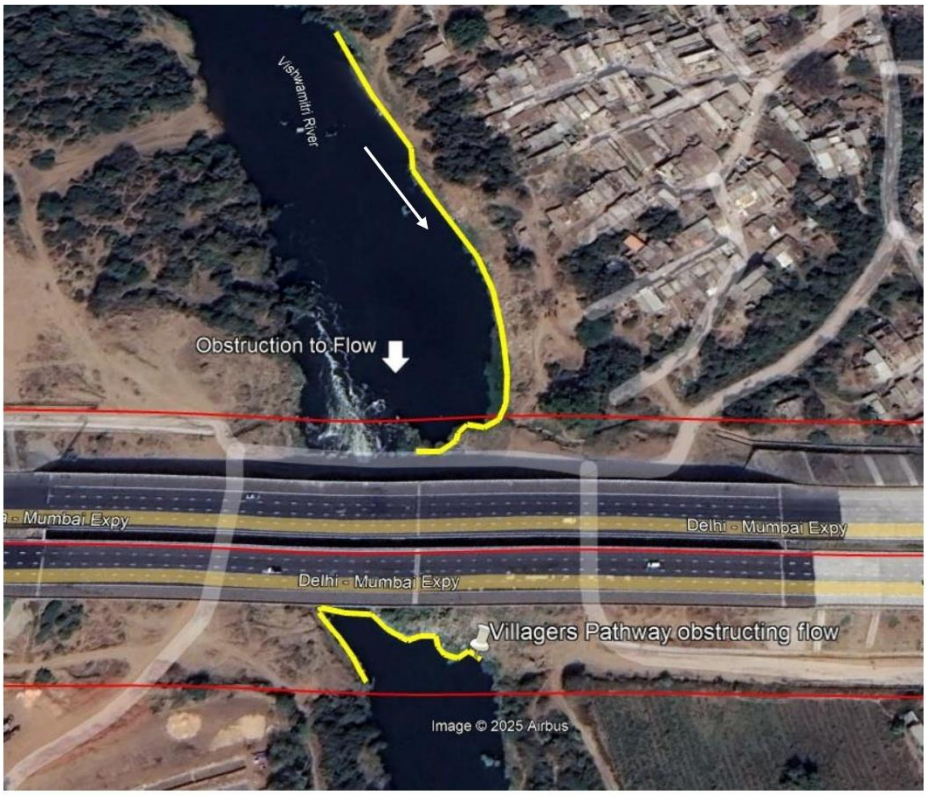
ગોહિલ કંચનભાઈ જશાભાઈ

સરપંચ
સાદડ ગ્રામ પંચાયત
તા.પાદરા, જિ. વડોદરા

[illegible]

NATIONAL HIGHWAYS AUTHORITY OF INDIA
Project Implementation Unit (PIU)-Godhra

Obstruction to River Flow Representation



NATIONAL HIGHWAYS AUTHORITY OF INDIA
Project Implementation Unit (PIU)-Godhra

Dhadhar River Flow Cleared (During & After Cleaning Photographs)


17 June 2025 at 10:53 AM
N 22° 7' 3", E 73° 3' 47"
Gujarat,Vadodara,Padra
336.700 Visheamaitri


17 June 2025 at 11:21 AM
N 22° 7' 1", E 73° 3' 45"
Gujarat,Vadodara,Padra
336.700 Visheamaitri


17 June 2025 at 12:03 PM
N 22° 7' 1", E 73° 3' 46"
Gujarat,Vadodara,Padra
336.700 Visheamaitri


17 June 2025 at 12:03 PM
N 22° 7' 1", E 73° 3' 46"
Gujarat,Vadodara,Padra
336.700 Visheamaitri

Annexure VIII: Soil Erosion at Akota Bridge

Annexure IX: Report by Irrigation Department (Relevant pages)

અનુક્રમણીકા

૧.૦પરિચય:

- વડોદરા શહેરની મધ્યમાંથી પસાર થતી વિશ્વામિત્રી નદી પંચમહાલ જીલ્લાના હાલોલ તાલુકાના પાવાગઢ પર્વતમાંથી ઉદ્ભવી ૭૦.૬૦ કીમી જેટલી લંબાઈમાં વહી કરજણ તાલુકાનાં પીંગલવાડા ગામે ઢાઢર નદીને મળે છે.
- વિશ્વામિત્રી નદી સાંકળ ૩૪.૦૦ કીમી થી મોજે દેણા ગામ પાસેથી વડોદરા શહેરમાં પ્રવેશે છે જ્યાંથી આશરે ૨૬ કીમીની લંબાઈમાં વેમાલી, હરણી, સમા, ફતેગંજ, કાલાઘોડા, અકોટા, કલાલી, વડસર તથા જાંબુવા થઈને વડોદરા શહેરની બહાર નીકળે છે.
- ઓગસ્ટ ૨૦૨૪મા વડોદરા શહેર અને તેની આસપાસના વિસ્તારમાં પડેલા ભારે વરસાદના કારણે પુરના પાણી શહેરી વિસ્તારમા ભરાવાની સમસ્યા ઉદભવેલ .
- ભવિષ્યમા આવી સમાસ્યા ન ઉદભવે તથા જાનમાલને નુક્સાન ના થાય તે માટે વડોદરા શહેરને વિશ્વામીત્રી નદી ના કેચમેંટ વિસ્તારમાંથી આવતા વરસાદી પાણીનુ યોગ્ય વ્યવસ્થાપન થાય તે આવશ્યક જણાય છે .
- વડોદરા શહેર અને તેની આસપાસના વિસ્તારમા પાણીના નૈસર્ગીક સ્ત્રોત અને પાણી નિકાલની કુદરતી વ્યવસ્થાને અસરકરતા પરીબળો સમીકક્ષા કરવી,મહાનગરપાલીકા વિસ્તાર અને આસપાસમા આવેલા તળાવો અને અન્ય જળ સ્ત્રોતની સમીક્ષા કરી વધારાના પાણી નિકાલની યોગ્ય વ્યવસ્થા કરવી ખુબ જરુરી જણાય છે.
- આથી સરકારશ્રી દ્વારા પુર નિવારણ પગલા લેવા તા.૧૩.૦૯.૨૪ થી નીચે મુજબ ઉચ્ચ કક્ષાની સમિતિની રચના કરવામા આવેલ.

૧	શ્રી બી.એન.નવલાવાલા , પુર્વ સચિવશ્રી ભારત સરકાર	અધ્યક્ષશ્રી
૨	શ્રી એસ.એસ.રાઠોર ,માન.મુખ્યમંત્રીશ્રીના સલાહકાર	સહ અધ્યક્ષશ્રી
૩	શ્રી એન. એન. રાય, ચીફ એન્જિનિયર શ્રી, સેન્ટ્રલ વોટર કમિશન	સભ્ય શ્રી
૪	પ્રો. ગોપાલ ભાટી, સિવિલ એન્જિનિયરિંગ, એમ.એસ.યુનિવર્સિટી	સભ્ય શ્રી
૫	શ્રી દિલીપ રાણા, મ્યુનિસિપલ કમિશનરશ્રી, વડોદરા મહાનગરપાલિકા	સભ્ય સચિવશ્રી

- રાજ્ય સરકારશ્રી દ્વારા ગત વર્ષ ૨૦૨૪માં વિશ્વામિત્રી નદીમાં આવેલ ભારે પૂરને કારણે થયેલ તારાજીનું પુનઃસર્જન ના થાય તે હેતુસરથી તા.૧૩/૦૯/૨૦૨૪ના રોજ ઉચ્ચ-સ્તરીય કમીટીનું ગઠન કરવામાં આવેલ છે.
- ઉચ્ચ-સ્તરીય કમીટી દ્વારા આપવામાં આવેલ લાંબા ગાળા અને ટૂંકા ગાળાના કામો સૂચવેલ,તે મુજબ સિંચાઇ વિભાગ હસ્તક આવતા કામોનું નીચે મુજબ આયોજન કરેલ છે.

ટૂંકાગાળાની કામગીરી	લાંબાગાળાની કામગીરી
• વિશ્વામિત્રી ક્લીયરીંગ અને રીસેક્શનીંગની કામગીરી	• નવા ચેકડેમ બનાવવાની કામગીરી
• કાંસ સાફ-સફાઈને લગત કામગીરી	• હયાત આજવા સરોવર ખાતે બેરેજ બનાવવાની કામગીરી
• ચેકડેમ રીપેરીંગની કામગીરી	• આજવા સરોવરની દક્ષિણેથી જાંબુવા નદીમાં ડાયવર્ઝન ચેનલ બનાવવી
• વડદલા, હરીપુરા અને ધનોરા તળાવોનું ડ્રેજીંગ કરી તેની સંગ્રહ સમતા વધારવાનું કામ (પંચાયત સિંચાઇ વિભાગ)	• પ્રતાપુરા ડેમના વેસ્ટવિયર ઉપર ગેટ મૂકી સ્ટોરેજ કેપેસિટી વધારવાનુંકામ
	• ઢાઢર નદી ઉપર બરાજ બનાવવાનું કામ

૨.૦ ટૂંકાગાળાની કામગીરી

૨.૧ વિશ્વામિત્રી નદીની રી-સેક્શનની કામગીરી

- જેમાં તાત્કાલીક કામગીરી અંતર્ગતવડોદરા શહેર બહારની વિશ્વામિત્રી નદીની મારેઠા થી પિંગલવાડા (૨૫ કિ.મી.) સુધી કલીયરીંગની કામગીરી ઝડપી પૂર્ણ કરવા અર્થે જુદા-જુદા ૬(છ) પેકેજમાં સિંચાઇ વિભાગ દ્વારાતા.૨૪/૧૨/૨૦૨૪નાં રોજ રૂ.૫૦.૯૮ કરોડનાં અંદાજપત્રકો બનાવી સરકારશ્રી કક્ષાએ વહીવટી મંજુરી માટે સાદર કરવામાં આવેલ હતા.
- જે વહીવટી મંજુરીની અપેક્ષાએ તા.૧૭/૦૧/૨૦૨૫નાં રોજ અંદાજપત્રકો તાંત્રીક મંજુરી માટે તેમજ તા.૧૮/૦૧/૨૦૨૫નાં રોજ ડી.ટી.પી મંજુરી માટે સરકારશ્રી કક્ષાએસાદર કરવામાં આવેલ હતા.
- તા.૨૦/૦૧/૨૦૨૫નાં રોજ સરકારશ્રી કક્ષાએથીસદર કામની ૬(છ) પેકેજમાં તાંત્રીક મંજુરી અને ડી.ટી.પી મંજુરી મળેલ હતી.
- તા.૦૫/૦૨/૨૦૨૫નાં રોજ સરકારશ્રી કક્ષાએથી સદર કામની ૬(છ) પેકેજ માટેની વહીવટી મંજુરી મળેલ હતી
- તા.૧૪/૦૨/૨૦૨૫નાં રોજ પેકેજ વાઇસ ટેન્ડર ની ટેકનીકલ ઈવોલ્યુશન કરી પ્રાઇસ બીડ ઓપન કરેલ હતીજે પેકેજ વાઈઝ ટેન્ડર મંજૂરી માટે સરકારશ્રીમાં સાદર કરવામાં આવેલ હતી
- જેને તા.૧૭/૦૩/૨૦૨૫ના રોજ સદર કામોને ટેન્ડર મંજૂરી મળેલ હતી.પરંતુ તા.૧૮/૦૩/૨૦૨૫ના રોજ કામની અગત્યતા ને ધ્યાને લઈને એલ.ઓ.એ.ના આધારે એજન્સી પાસે જંગલ કટીંગ ની કામગીરી શરૂ કરાવવામાં આવેલ હતી.
- એજન્સી દ્વારા સિક્યુરિટી ડિપોઝિટ ભરતા તા.૨૮/૦૩/૨૦૨૫ અને તા.૨૯/૦૩/૨૦૨૫ના રોજ તેઓને વર્ક ઓર્ડર આપવામાં આવેલ.
- વર્ક ઓર્ડર મળ્યા પછી સરકારશ્રી કક્ષાએથી થયેલ આદેશ મુજબ પેકેજ વાઇસ ગુણવત્તા નિયમન ગાંધીનગર વડોદરા, સુરત અને અમદાવાદ તેમજઅન્ય પેટા વિભાગીય કચેરીના અધિકારીઓનેઈનિશિયલ લેવલ ચેક કરાવવાની કામગીરીની પધ્ધતીથીમાહીતગાર કરેલ.

- ઈનિશિયલ લેવલની કામગીરી પૂર્ણ થતા એજન્સીઓ દ્વારા નદી રિશેક્શનિંગ માટે ખોદાણ કામગીરી શરૂ કરેલ હતી જેના માટે એજન્સીઓ દ્વારા ૬ પેકેજમા કુલ ૨૫ કીમી.માં નીચે મુજબ મશીનરી ઉતારેલ હતી.

Hitachi	JCB	Loader /Dozer	Dumper
૩૩	૦૯	૦૨	૧૨૪

- કામગીરી દરમિયાન વારંવાર ખેડૂતો દ્વારા વિરોધને કારણે ડી.આઇ.એલ.આરનાં સર્વેયર ટીમને જરૂર જણાય ત્યારે સાથે રાખીને માપણી કરાવી તેમજ જરૂર જણાય ત્યાં પોલીસ પ્રોટેક્શન લઈને કામગીરી આગળ વધારેલ હતી.

૨.૧.૨વિશ્વામિત્રી નદીનાં કાંઠેમગરના દરો

- સદર કામગીરીમાં ફોરેસ્ટ વિભાગને અગાઉથી જાણ કરવામાં આવેલ હતી તેમજ તેઓ દ્વારા વોલન્ટેયર દ્વારા જ્યાં જરૂર જણાય ત્યાં જળચર પ્રાણીને સુરક્ષિત જગ્યા પર ખસેડીને કામગીરી હાથ ધરેલ.
- તેમજ જ્યા જ્યા મગરના દર હોય તે જગ્યા છોડીને કામગીરી હાથ ધરેલ હતી.

૨.૧.૩.વિવિધ પદાધિકારીઓની સ્થળ મુલાકાત

- માનનીય કલેકટરશ્રી વડોદરા અને પર્યાવરણવીદ દ્વારા તા.૨૫/૦૪/૨૦૨૫ના રોજ વિઝીટ થઈ અને તેઓ દ્વારા આપવામાં આવેલ સૂચના ને ધ્યાને લઈ કાળજીપૂર્વક કામગીરી હાથ ધરવામાં આવેલ.

૨.૧.૫.કામગીરીમાં અવરોધ

- તા. ૨૮/૦૪/૨૦૨૫ના રોજ પર્યાવરણવીદ અને પેટાવિભાગીય કચેરીના અધિકારી સાથે રાખીને વોક થ્રુ સર્વે કરેલ જેમાં બુલેટ ટ્રેનની કામગીરીના કારણે નદીમાં થયેલ દબાણ અને નાળા દુર કરવા અંગેની કાર્યવાહી કરવા સુચનો કરેલ.જેને અનુસંધાને અત્રેની કચેરી દ્વારા ફરીથી બુલેટ ટ્રેન પ્રોજેક્ટને લગત કચેરીને પત્ર પાઠવેલ છે.તેમજ ૧૨/૦૫/૨૦૨૫ માનનીય કલેક્ટરશ્રી વડોદરા દ્વારા બુલેટ ટ્રેન પ્રોજેક્ટના અધિકારીનો સાથે મિટિંગ કરી દબાણો દુર કરવા સુચના આપેલ છે. અને તારીખ ૦૩/૦૬/૨૦૨૫ના રોજ માનનીય કમિશનરશ્રી વડોદરા મ્યુનિસિપલ કોર્પોરેશનની અધ્યક્ષતામાં પણ બુલેટ ટ્રેન પ્રોજેક્ટના અધિકારીનો સાથે મિટિંગ કરી સદર દબાણો ચોમાસા પહેલા દુર કરવા સુચના આપેલ છે.

૨.૧.૬.અંતિમ લેવલની કામગીરી:

- સરકારશ્રી કક્ષાએથી થયેલ આદેશ મુજબ પેકેજ વાઇસ ગુણવત્તા નિયમન ગાંધીનગર વડોદરા, સુરત અને અમદાવાદ દ્વારા ૧૦% તેમજ અન્ય પેટા વિભાગીય કચેરીના અધિકારીઓને ૧૦૦% ફાઇનલ લેવલ ચેક કરાવવાની કામગીરી હાથ ધરેલછે.

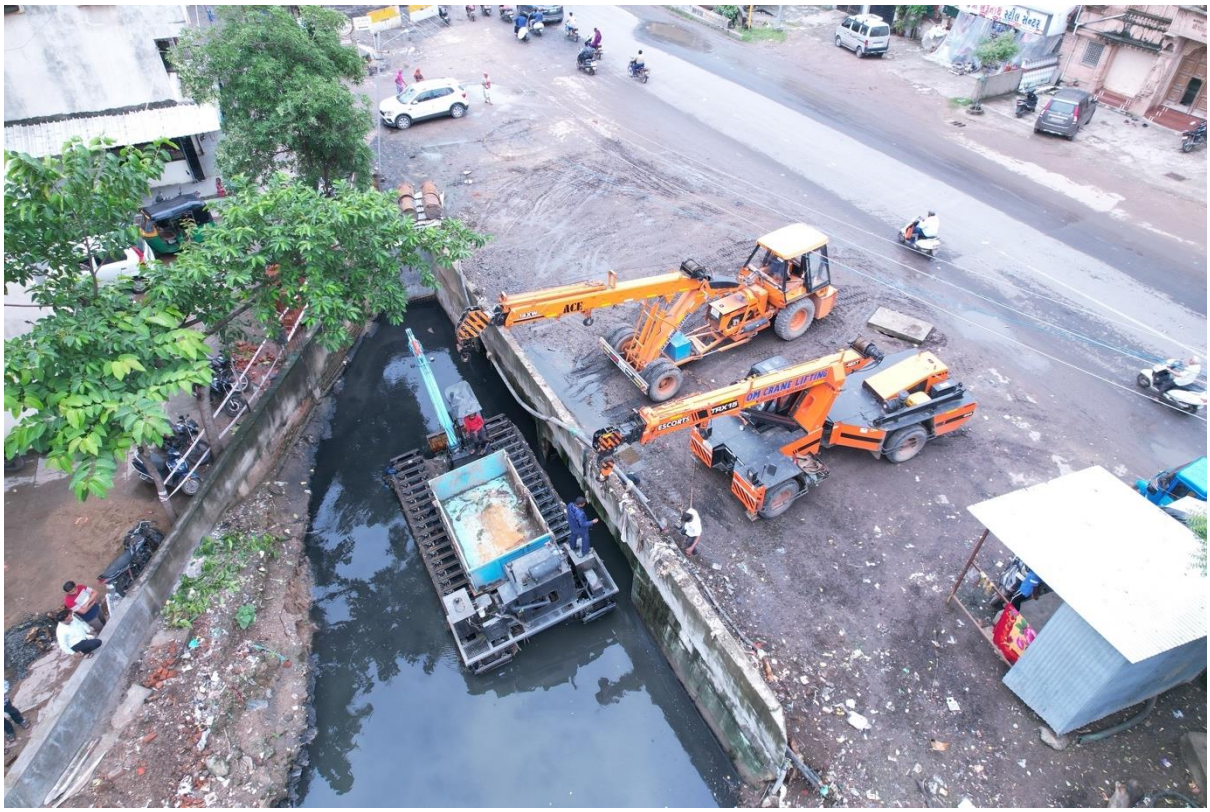
૨.૨ ચેક ડેમ રીપેરીંગની કામગીરી

- વિશ્વામિત્રી નદી તેમજ તેમાં જોડાતા કોતરો ઉપર આવેલ હયાત ચેકડેમોનો સર્વે કરી રીપેર કરવા યોગ્ય ચેકડેમોને રીપેર કરવા સુચનો મળેલ છે. જે અનુસાર સિંચાઈ વિભાગ દ્વારા કુલ ૬ ચેકડેમની રીપેરીંગની કામગીરીઅંદાજીત રૂ. ૮૪ લાખના ખર્ચેહાથ ધરવામાં આવેલ. જે પૈકી ૫ ચેકડેમની રિપેરિંગની કામગીરી પૂર્ણ કરવામાં આવેલ છે. ૧ ચેકડેમની રીપેરીંગની કામગીરી હાલ પ્રગતિ હેઠળ છે. જે તા.૧૦/૦૬/૨૦૨૫ સુધીમાં પુર્ણ કરવાનું આયોજન છે.

Annexure X: Drone Survey of ‘Kaans’ by VMC (Relevant pages) dated 29.07.2025

Undera to Gotri

Ruparel Kaans


ACE
OM CRANE LIFTING


MANJAL TRANSPORT
R.S.LOGISTICS

Priya Tlkies to Bhayli Kaans

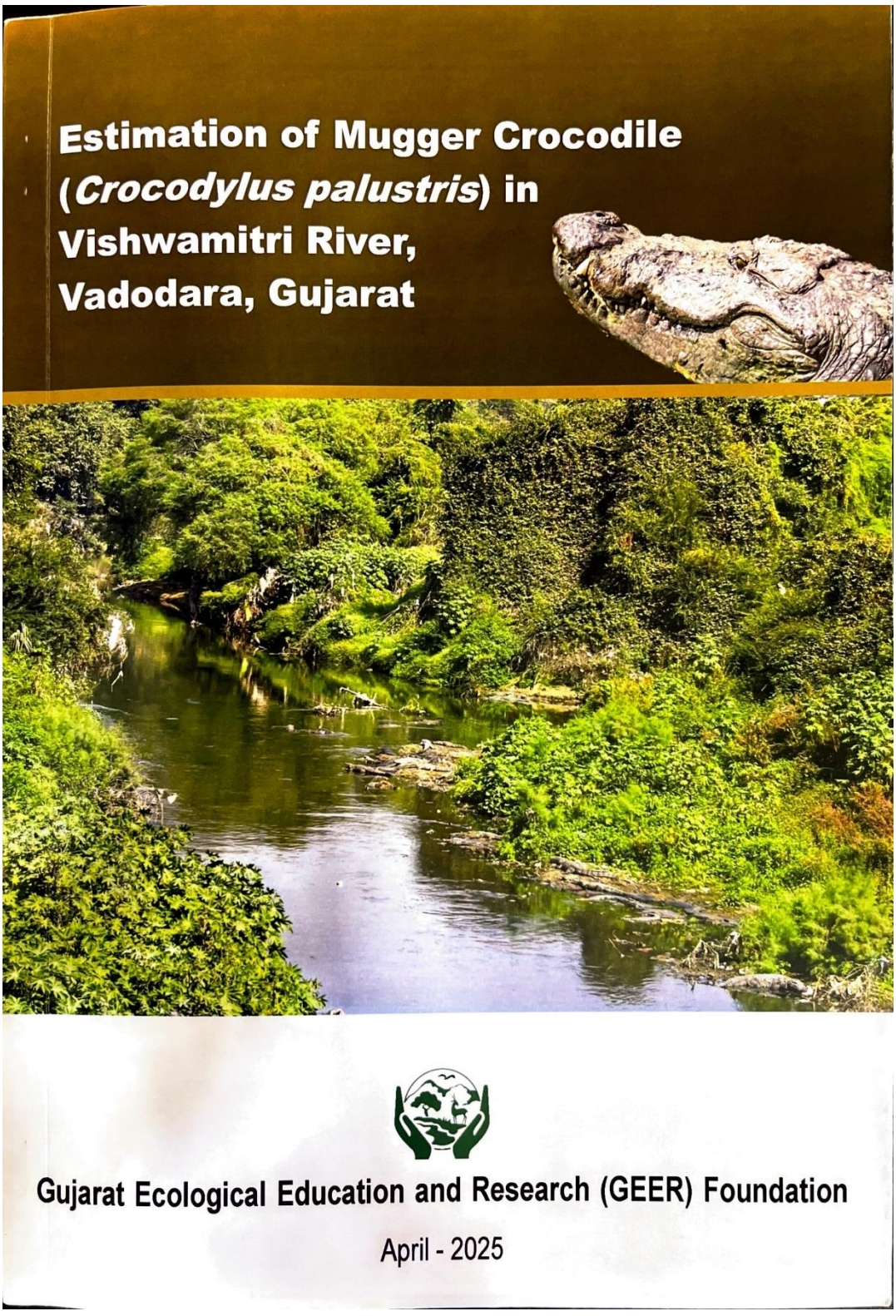
Vasna Talav to Vasna Jakatnaka

Ghanghretiliya

Mahanagar Kaans


AXIMUS EDUCATION
TARSALI
VADODARA
Vishwas
Water Tank Cleaning
M:84601 44941

Annexure XI: GEER Foundation Report on Mugger Crocodile count (Relevant pages)



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		Asst. Professor, M.S. University of Baroda, Vadodara
		Mr. Manoj Thakar,
		Naturalist and wildlife export, Vadodara
		Mr. Kartik Upadhyay,
		Naturalist and wildlife export, Vadodara
		Dr. Sandeep Munjpara,
		Scientist (I/C), GEER Foundation
Document preparation	:	**Dr. Sandeep Munjpara,**
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Enumerators	:	Annexure - V
Mapping	:	**Mr. Nitin Patel,** SRF- RS-GIS
		Mr. Sanjay Shrimali, RS-GIS Assistant

Contents

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2

Mugger Crocodile Estimation – 2025

2.1 Area under the estimation

A 22 km stretch of the Vishwamitri River, from Dena upstream to Talsat downstream for the Estimation of Mugger – 2025 (Map-1). This segment passes through Vadodara city, encompassing urban, semi-urban, and natural habitats, providing a diverse landscape for Mugger crocodiles.

The Vishwamitri River, a seasonal river originating in the Pavagadh Hills in the Panchmahal District of Gujarat, flows east to west through the Vadodara District. Urban landscape of Vadodara city from Dena village to Talsat village before joining the Dhadhar and Khanpur rivers and ultimately emptying into the Gulf of Khambhat. The river system encompasses natural meanders, oxbows, associated lakes, ponds, drains (Kaas), and rivulets, forming a unique riverine ecosystem within a highly populated urban setting (Vyas, 2018a; Pagdand, 2019). It supports a diverse riparian ecosystem, making it a vital habitat for Muggers, a keystone species in India's freshwater ecosystems.

2.1.1 Hydrological Features

The Vishwamitri River's water volume varies seasonally due to its dependence on monsoon rainfall. According to the India Meteorological Department (IMD), Vadodara receives an average annual rainfall of 900–1,000 mm, with over 90% occurring during the monsoon season (June–September). In 2024, Vadodara experienced extreme rainfall events; for instance, on August 26–27, the city recorded 260 mm in 24 hours, causing the river to surge to 35.25 feet at Kala Ghoda bridge, well above its 26-foot danger mark. During the dry season (October–May), flow diminishes significantly, often reducing the river to isolated pools and ponds, with water retention aided by natural depressions and structures like the Ajwa reservoir and Pratappura reservoir, which release water into the Vishwamitri during high inflow periods.

2.2 Methodology

The Gujarat Ecological Education and Research (GEER) Foundation conducted a systematic survey to estimate the Mugger crocodile (*Crocodylus palustris*) population along the Vishwamitri River, employing the Total Count Method. As the species is protected under Wildlife (Protection) Amendment Act, 2022 a permission to estimate the number was taken from the PCCF(WL) & CWLW Gujarat State (Annexure-I). The survey was carried out during 5th and 6th February, 2025, covering a 22 km stretch of the river from Dena upstream to Talsat downstream. The detailed methodology along with zonation of the river, team formation, and the pre-, during-, and post-survey activities are given below:

2.2.1 Estimation Approach

The Total Count Method was employed to estimate the Mugger crocodile (*Crocodylus palustris*) population along the Vishwamitri River. This approach remained the same as that used for the 2020 estimation conducted by the Gujarat Forest Department. Additionally, the counting method primarily focused on basking time and night time surveys, following the approach used by Vyas (2010a, 2018a) and Pagdand, (2019). The Total Count was carried out relying on direct observations of individuals during both daylight and night time hours to achieve a comprehensive estimation. Observers were equipped with binoculars and spotting scopes for daytime surveys and high-powered torches for nocturnal observations, enabling detailed scanning of riverbanks, sandbanks, adjacent habitats, and strategically selected points. The survey recorded critical attributes, including the total number of individuals, their size in feet, observed behaviours (such as basking, swimming, logging, or resting) etc. GPS devices were utilized to geotag the exact locations of all sightings. In areas where terrain inaccessibility or the need for enhanced accuracy precluded conventional observation Drone Camera were deployed to supplement ground-based efforts, capturing high-resolution imagery and facilitating detection in challenging environments. All data were systematically recorded on standardized datasheets, specifically designed for this study (Annexure - II).

2.2.2 Estimation Period

The survey to estimate the Mugger crocodile population along the Vishwamitri River was conducted on 5th and 6th February, 2025. This period was deliberately selected to coincide with the dry season in the region. During this time, water levels in the river notably remain low due to reduced rainfall and minimal inflow. The reduction in water volume concentrates the crocodile population into smaller, more defined areas such as deeper pools, exposed riverbanks, and remnant water bodies, making them more accessible and observable for accurate counting.

The timing was further advantageous as it aligned with the ecological behaviour of Mugger crocodiles, which tend to aggregate in these confined habitats during the dry season, reducing the likelihood of missing individuals dispersed across a broader expanse of water. Additionally, the cooler winter temperatures in early February played a critical role in enhancing the survey's effectiveness. These conditions encouraged basking behaviour among the crocodiles, prompting them to rest on sunlit riverbanks, sandbanks, or other elevated surfaces to absorb heat. This increased visibility significantly improved the detection rate.

To maximize observation efficiency, surveys were strategically conducted in the morning (8:00–11:30 AM) on the 5th and 6th of February, 2025, along with a night observation on 5th February. The timing of the daytime count was decided to align with the peak basking hours of Mugger crocodiles, as determined by prior studies of their activity patterns (Vyas, 2010a, 2012, 2018a, Dhandh et al., 2019). During these morning hours, crocodiles typically emerge from the water to bask in the sun, taking advantage of optimal sunlight conditions for thermoregulation. This behaviour increases their visibility, making it easier to achieve an accurate count. Moreover, Drone survey was carried out during this time assisting the enumerators.

The night observation was conducted to further enhance detection accuracy. At night, the reflective layer in crocodile eyes, known as the tapetum lucidum, causes their eyes to glow when illuminated by light. This natural phenomenon is leveraged to spot crocodiles that might remain hidden during the day, ensuring a more thorough and comprehensive population estimate.

2.2.3 Zonation of River for estimation

For the Mugger crocodile population estimation along the Vishwamitri River, the survey area was divided into zones and sub-zones to streamline the assignment of teams and eliminate the chances of overlapping (Annexure-III & IV). The zonation followed was same as primary zones used by the State Forest Department during the 2020 estimation, ensuring comparability with previous data. These zones, spanning various stretches of the river, such as Vemali Highway to Sama Bridge (Zone-1) and Mujmahuda to Vadsar Bridge (Zone-5), were retained as consistent units of reference (Table-1). The length of the zones varied approximately from 1.1 km to 4.6 km, with this variation attributed to the use of recognizable landmarks for delineation. However, for this survey, sub-zones had been introduced within these zones to enhance precision and manageability. Each sub-zone was standardized at approximately 1 km in length for scientific analysis purposes, with the number of sub-zones, totaling 20 primarily determined by the overall length of the respective zone (Annexure-III). The delineation of both zones and sub-zones had been meticulously carried out at the RS-GIS section of the GEER Foundation. Each zone, ranging from 986m in Zone-6 (A) to 4,541 m. in Zone-6 (B), was assigned a specific number of teams (from one to five) based on its size and complexity. The sub-zones were defined by precise GPS coordinates, allowing for systematic coverage of the river's length. In addition to the zonation of the Vishwamitri River, key ponds within the study area were also incorporated into the estimation (Table-1). This structured approach ensured efficient team deployment and comprehensive monitoring of the crocodile population across the survey area.

Table-1: Zones used for Mugger estimation - 2025

SN	Zone	Details	Length (Km)
1	Zone-1 (A)	Vemali Highway to Sama bridge	4.2
2	Zone-2	Sama Bridge to Vuda circle	1.9
3	Zone-3 (A)	Ratri Bazar to Narhari Hospital	1.5
4	Zone-3(B)	Narhari Hospital to Kalaghoda bridge	2.2

SN	Zone	Details	Length (Km)
5	Zone-4(A)	Kalaghoda to Akota bridge	1.4
6	Zone-4(B)	Akota bridge to Mujmahuda	3.4
7	Zone-5	Mujmahuda to Vadsar bridge	1.5
8	Zone-6(A)	Vadsar bridge to Kalali	1.1
9	Zone-6(B)	Kalali to Talsat	4.6
10	Ponds	Kashivishvnath, Lalbaugh, Manjalpur-1,2,3, Kalali, Maneja, Talsat-1,2	9 ponds
11	Ponds	Chhani, Dumada, Vemali, Dena, Harani, Sama, Bhayali, Tandalaja	8 Ponds

2.2.4 Team formation and Responsibilities

To ensure a systematic and efficient Mugger crocodile estimation survey, a structured team formation approach was adopted, with clearly defined roles and responsibilities. The estimation process involved three key teams: the Coordination Team, the Subject Experts Team, and the Field Observation Teams.

[A] Coordination Team: The team was responsible for overseeing the entire estimation process, ensuring that tasks were executed on schedule, while maintaining communication with relevant officials, subject-matter experts, and volunteers. This team consisted of the Dy. Director (R&D), GEER Foundation, the Dy. Conservator of Forests, Vadodara (Social Forestry Division) and Vadodara (Wildlife Division). The team acted as the central point of contact for all teams, facilitating permissions, logistics, and operational planning. Additionally, the Scientist In-Charge from GEER Foundation played a crucial role in linking the Coordination Team with other teams, ensuring smooth execution of the survey.

[B] Subject Experts Team: Subject experts played a crucial role in planning, executing, and validating the estimation process. This team comprised experienced researchers and naturalists with extensive knowledge of Mugger crocodiles and their habitats. The members included, Mr. Anirudh Vasava (VNC-India, Vallabh Vidyanagar), Dr. Ranjitsinh Devkar (Assistant

and environmental factors, favourable to the species. According to them, the absence of interspecific competition (competition between different species) and natural predators, along with the availability of large water spread, has likely minimized intraspecific competition (competition among individuals of the same species) for food, shelter, and breeding, thereby reducing territorial conflicts.

Additionally, successful breeding and recent floods may have facilitated the movement of individuals from nearby ponds to the river, as reflected in the lower crocodile count in associated water bodies. Experts also note that advancements in drone technology have improved detection, especially in inaccessible areas, enhancing the accuracy of population estimates. Furthermore, it is believed that human-induced factors have inadvertently contributed to the crocodiles' sustenance. In certain areas, waste dumping provides a consistent food source, indirectly supporting the species.

3.3 Distribution and Linear Density of Mugger Crocodiles in the Vishwamitri River

The Mugger crocodile population in the Vishwamitri River is unevenly distributed across different zones, might be influenced by ecological factors such as habitat suitability, prey availability etc. To ensure comparability across zones of varying lengths, linear density (mugger/km) was calculated for each zone. The overall linear density of Muggers in surveyed river stretch of 21.8 km is 19.6 mugger/km, a significant increase from 6.25 mugger/km reported by Pagdand (2019).

The 2025 survey revealed that certain stretches of the river recorded significantly higher densities of crocodiles, while others exhibit moderate to low concentrations. The highest densities were recorded in Zone 4A (Kala-Ghoda to Akota Bridge, 1.4 km) and Zone 3B (Narhari Hospital to Kala-Ghoda, 2.2 km), with 44 mugger/km and 39 mugger/km, respectively (Fig. 2). Moderate-density zones include Zone 6A (Vadasar Bridge to Kalali, 1.1 km) with 37 mugger/km and Zone 5 (Mujmahuda to Vadasar Bridge, 1.5 km) with 29 mugger/km. In contrast, lower-density zones include Zone 1 (Vemali Highway to Sama Bridge, 4.2 km) with 9 mugger/km and Zone 4B (Akota Bridge to Mujmahuda, 3.4 km) with 12 mugger/km.

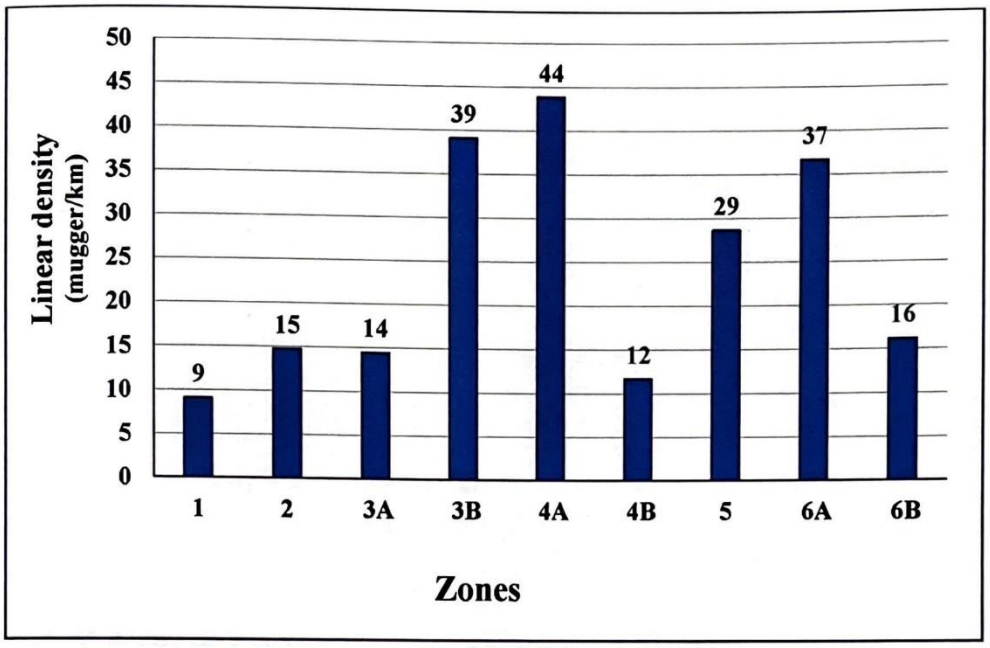


Figure-2: Linear density of Mugger in each Zone (mugger/km)

The variation in the linear density of Mugger crocodiles across different zones of the Vishwamitri River can be attributed to a combination of ecological and anthropogenic factors (Vyas 2010a; 2018a). Habitat suitability, including the availability of basking sites, nesting areas, and adequate water flow, plays a crucial role in supporting higher crocodile densities in certain zones. Food availability, whether from natural prey or human-generated waste, may influence crocodile aggregation in specific stretches.

Additionally, intraspecific competition (competition among crocodiles) may drive individuals to occupy different zones based on territorial behaviour. In contrast, human disturbances, such as urban development, pollution, and direct human interactions, may contribute to lower densities in certain areas. Seasonal factors, including flooding and fluctuations in water levels, could also influence crocodile movements and distribution patterns. Lastly, the efficiency of survey methods and detectability across different habitat types may have influenced the observed population estimates.

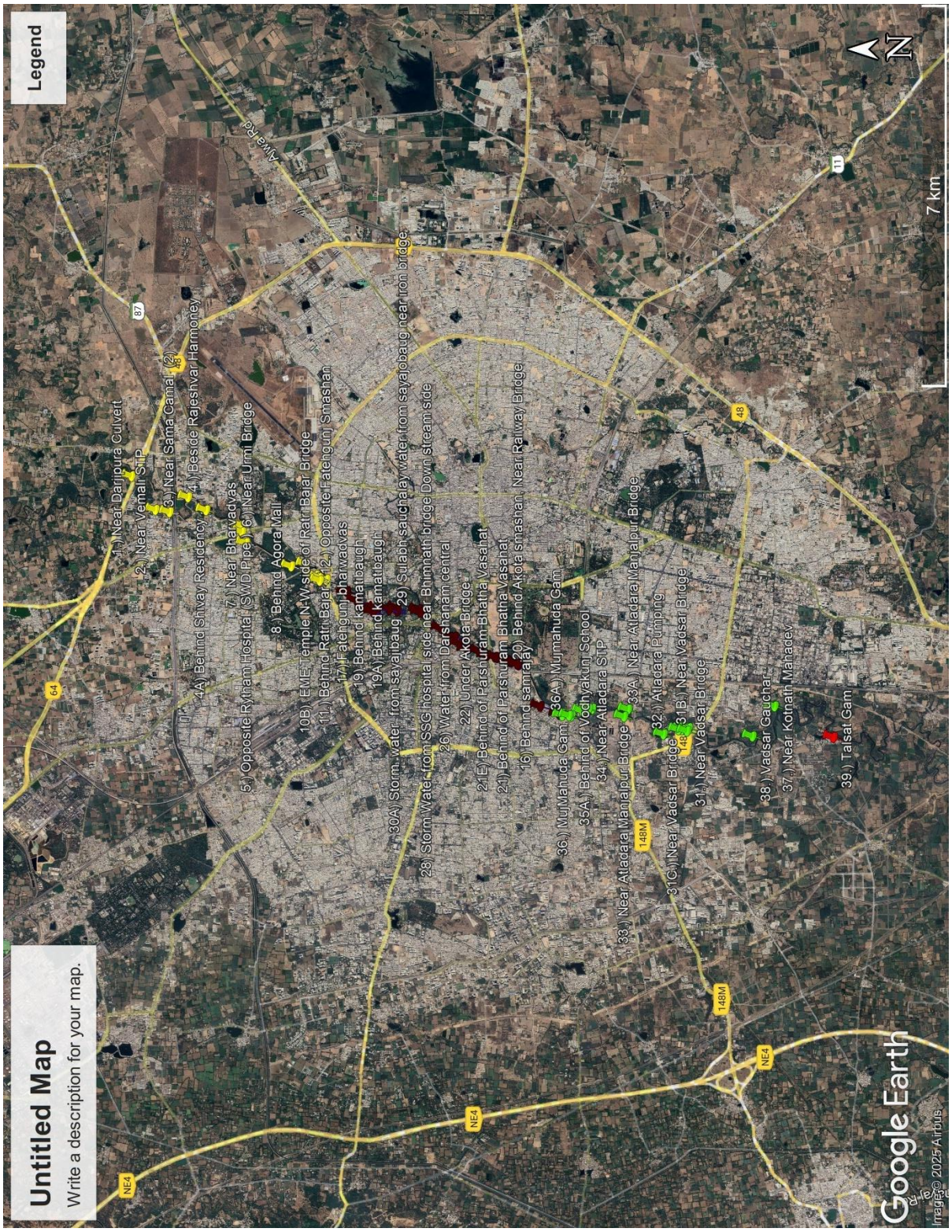
3.4 Other Observations and Records

During the estimation survey, a total of 16 burrows were recorded across different zones, indicating potential nesting or refuge sites for crocodiles. The highest number of burrows was observed in Zone 6B (8 burrows), followed by Zone 3B (5 burrows), Zone 5 (2 burrows), and Zone 1 (1 burrow). Vyas (2010a) reported comparative assessments of burrows over different years. In 1995, only nine burrows were recorded in the study area, with most located along the left bank of the river stretch between Kalaghoda and Mujmahuda, near the water level. By 2009, this number had significantly increased to 40 burrows, with the majority concentrated along the river stretch between Kalaghoda and Mujmahuda, while a smaller number was recorded between Mujmahuda and Vadasar Bridge.

Notably, in Zone 5, five observations of crocodiles in fight were recorded, possibly due to territorial fights linked to the breeding season. Additionally, a breeding display was observed at one location in Zone 5.

Apart from crocodile-related observations, turtles were also recorded in Zones 3A, 3B, 4A, 5, and 6A, highlighting the presence of other aquatic species in the river ecosystem. Indirect evidence of porcupines, along with direct sightings of Jungle Cats and Blue Bulls (Nilgai), was also recorded by the enumerators during the survey. Several bird species, including White Ibis, Red-wattled Lapwing, egrets, and Black-winged Stilts, were also documented.

Annexure XII: Drainage Outfall Mapping by VMC



Annexure XIII: Aquifer Data of Vadodara District

केन्द्रीय भूमि जल बोर्ड
जल संसाधन, नदी विकास और गंगा संरक्षण
विभाग, जल शक्ति मंत्रालय
भारत सरकार
Central Ground Water Board
Department of Water Resources, River
Development and Ganga Rejuvenation,
Ministry of Jal Shakti
Government of India

AQUIFER MAPPING AND MANAGEMENT OF GROUND WATER RESOURCES

Vadodara District
Gujarat

पश्चिम मध्य क्षेत्र, अहमदाबाद
West Central Region, Ahmedabad

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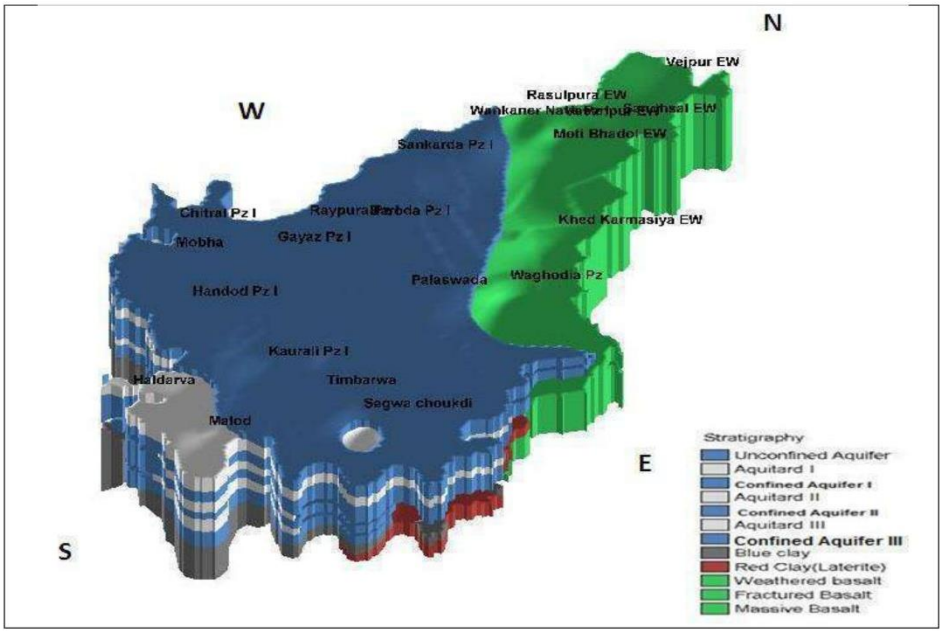
Technical Report Series

AQUIFER MAPPING AND MANAGEMENT OF GROUND WATER RESOURCES VADODARA DISTRICT, GUJARAT STATE



Government of India

Ministry of Jal Shakti

Department of Water Resources, RD and GRCentral Ground Water Board

West Central RegionAhmedabad

July 2022

AQUIFER MAP&MANAGEMENT PLAN OF
VADODARA DISTRICT GUJARAT
(4096.10 sq. km)

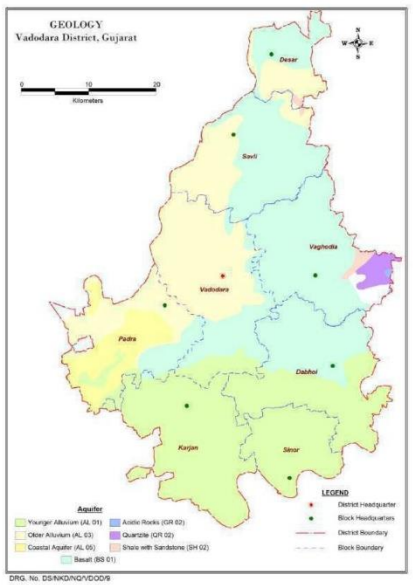


Fig No-6 Geology map of Vadodara

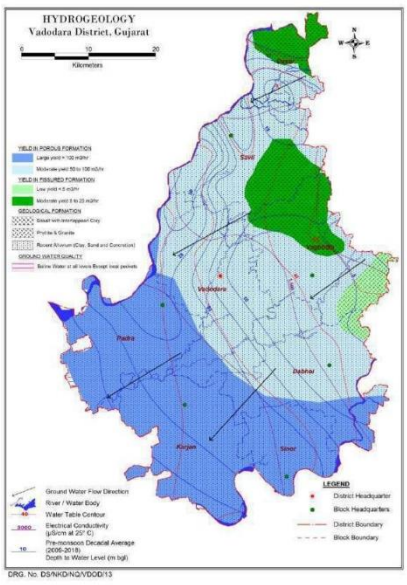


Fig No-7 Hydrogeology map of Vadodara

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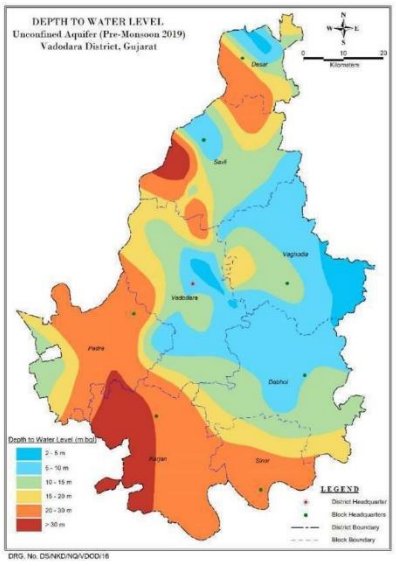

Figure 08: DTW May 2019 map of Vadodara district.

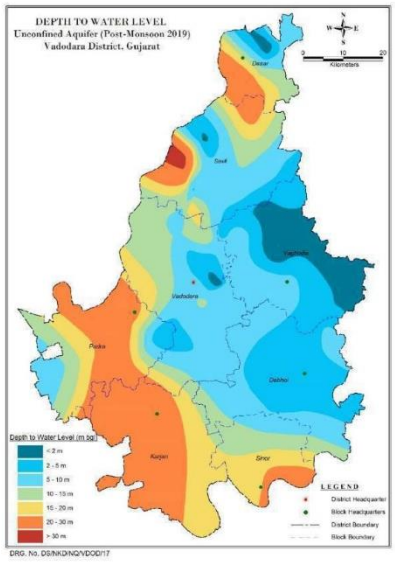

Figure 09: DTW November 2019 map of Vadodara district.

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Unconfined Depth to water Table maps of May-2019 & Nov-2019.

The maps showing depth to water table above mean sea level of May-2019 & Nov-2019 is given as figure no 10 & 11.The map reveals that the depth to water table with reference to mean sea level decreases from east to west i.e in general ground water is flowing from East to West direction.

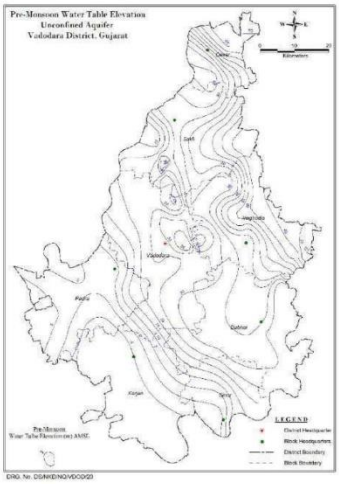

Figure 10: Unconfined Depth to water Table maps of May-2019

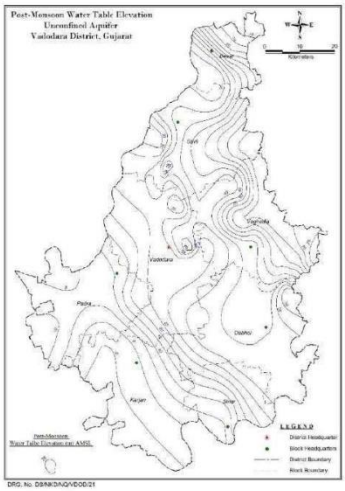

Figure 11: Unconfined Depth to water Table maps of Nov-2019

17

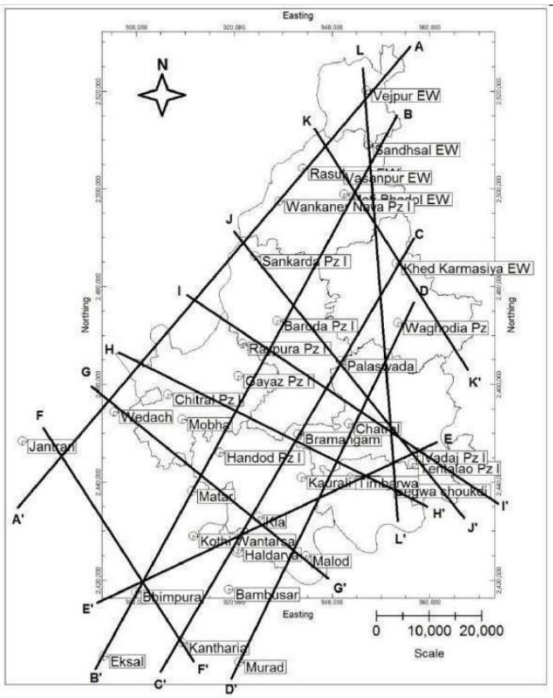

Fig No :14 Map Showing Section Lines

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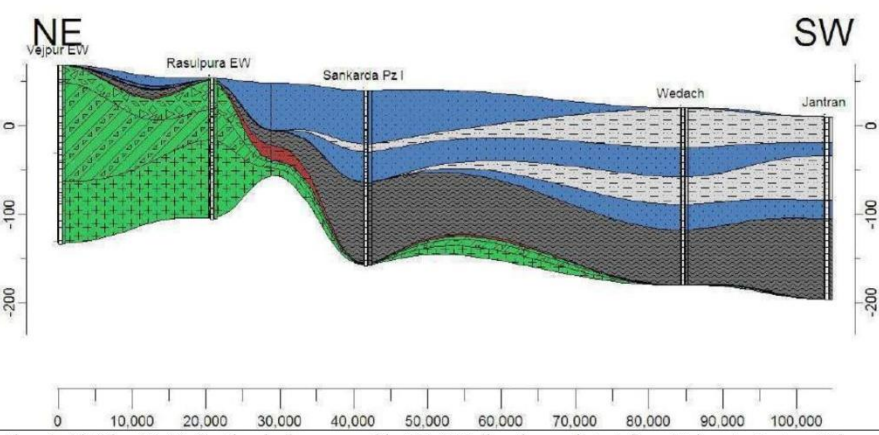
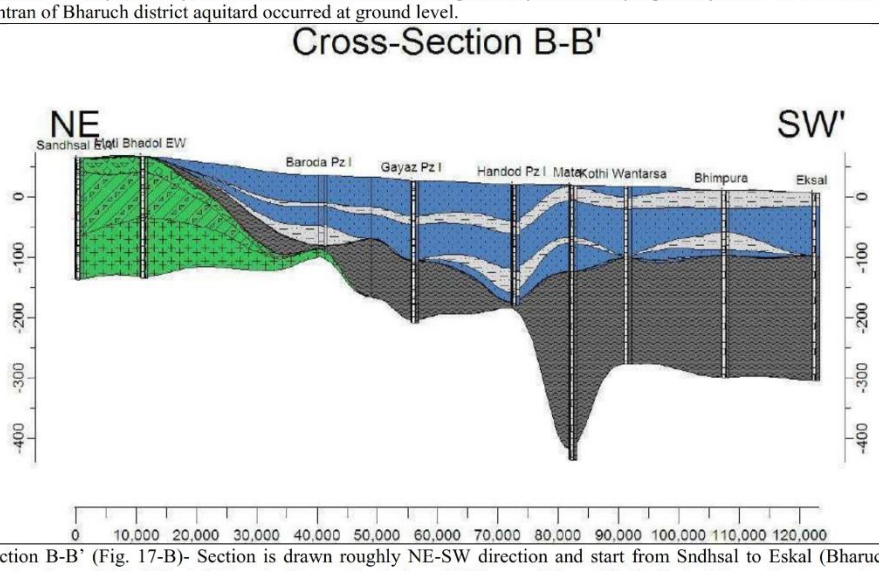
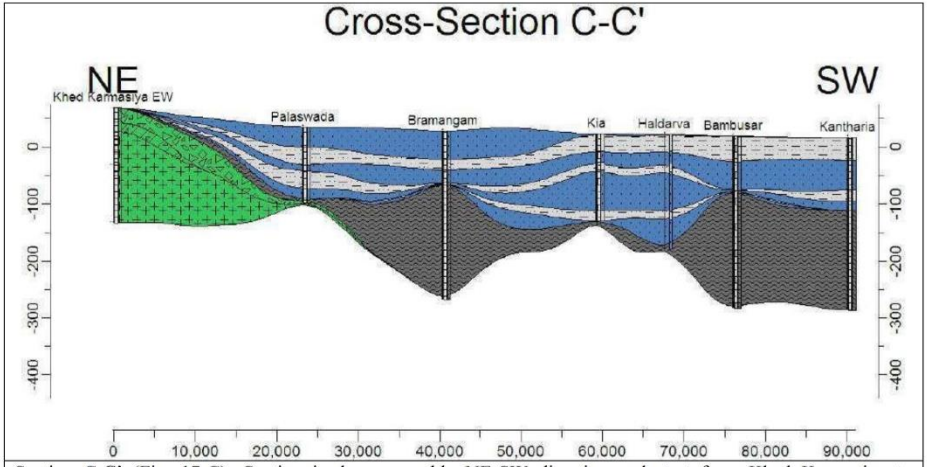


Section A-A' (Fig. 17-A)- Section is drawn roughly NE-SW direction and start from Vejpur to Jantran (Bharuch) passing through Rasulpura, Sankarda and Wedach(Bharuch). Section is represented geologically, In north-eastern part of the district, basalt (weathered & Fractured Basalt) forms the major aquifer. In remaining south-western part of the district, multilayered alluvium deposits forms the aquifer system. The aquifers are of phreatic and confined in nature. Blue clay (Tertiary) is the marker horizon between quaternary and tertiary aquifer systems. At Wedach and Jantran of Bharuch district aquitard occurred at ground level.

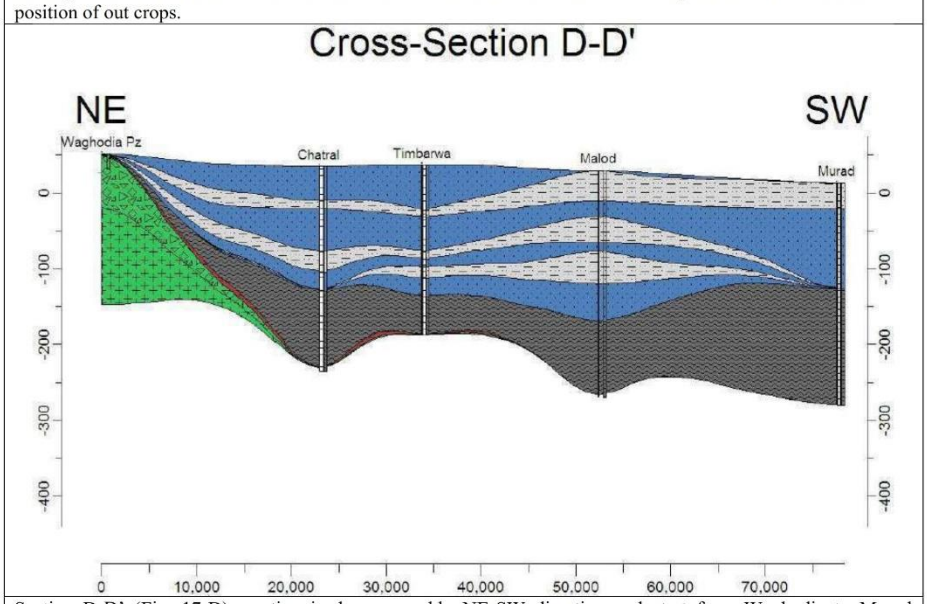


Section B-B' (Fig. 17-B)- Section is drawn roughly NE-SW direction and start from Sndhsal to Eskal (Bharuch) passing through Moti Bhadol, Baroda, Gayaz, Handod, and Bhimpura (Bharuch). Geological formation encountered more or less same as in the section A-A' except variation of thickness and position of out crops.

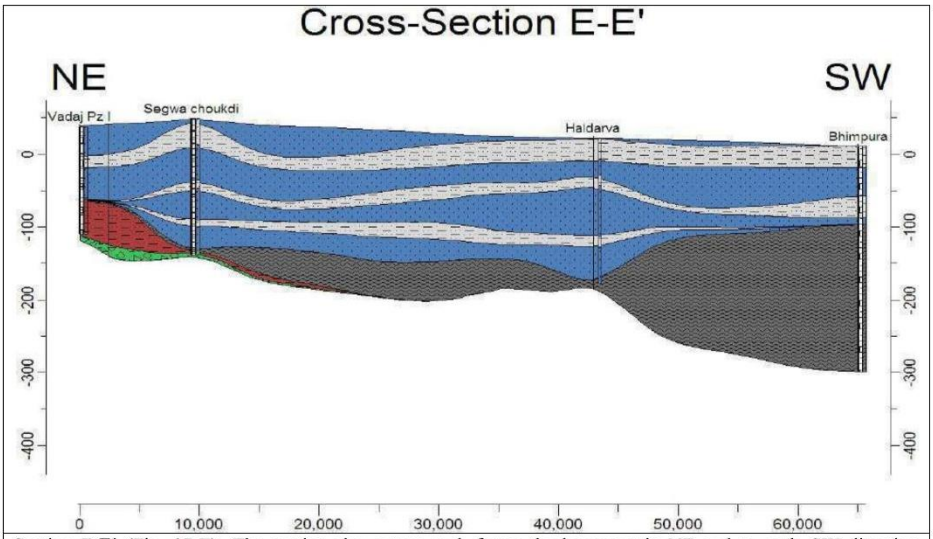
30



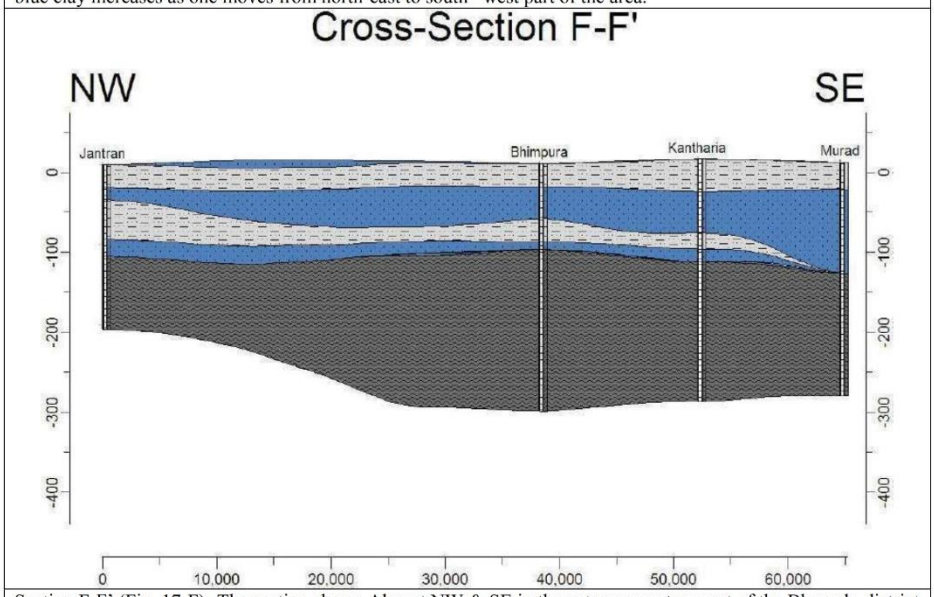
Section C-C' (Fig. 17-C)- Section is drawn roughly NE-SW direction and start from Khed Karmasiya to Kanthariya (Bharuch) passing through Palaswada,Bramangam,Kia,Haldarva and Bambusar (Bharuch). Geological formation encountered more or less same as in the section A-A' except variation of thickness and position of out crops.



Section D-D' (Fig. 17-D)- section is drawn roughly NE-SW direction and start from Waghodia to Murad (Bharuch) passing through Chatral, Timbarva and Malod (Bharuch). Geological formation encountered more or less same as in the section A-A' except variation of thickness and position of out crops.



Section E-E' (Fig. 17-E)- The section shows trap rock forms the basement in NE and towards SW direction subsurface geological formations comprise alternating layers of sand and clay etc. It is also seen that the thickness blue clay increases as one moves from north-east to south –west part of the area.



Section F-F' (Fig. 17-F)- The section shows Almost NW & SE in the extreme western part of the Bharuch district depicting continues thick aquitard occurred at ground level. It is also seen that the thickness blue clay increases as one moves from north-west to south –east part of the area.

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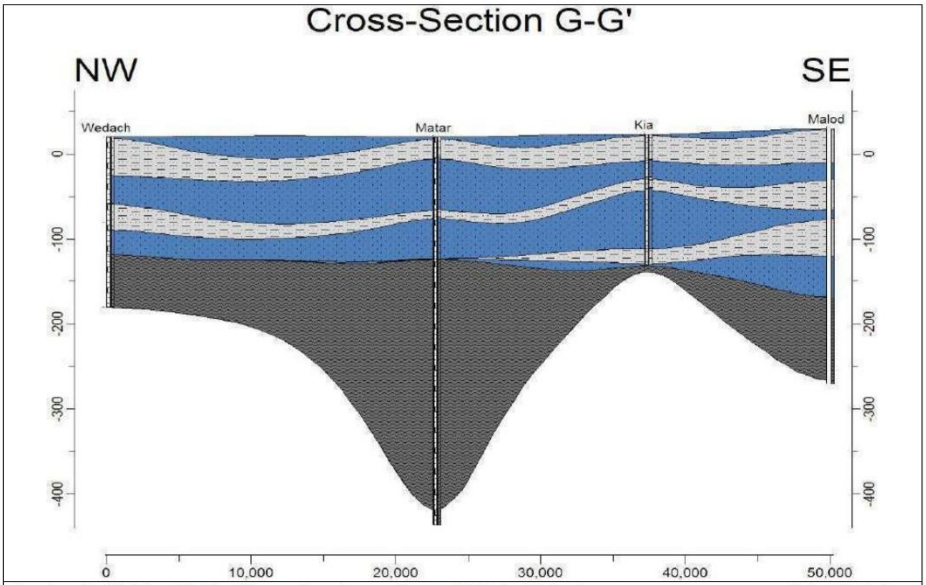
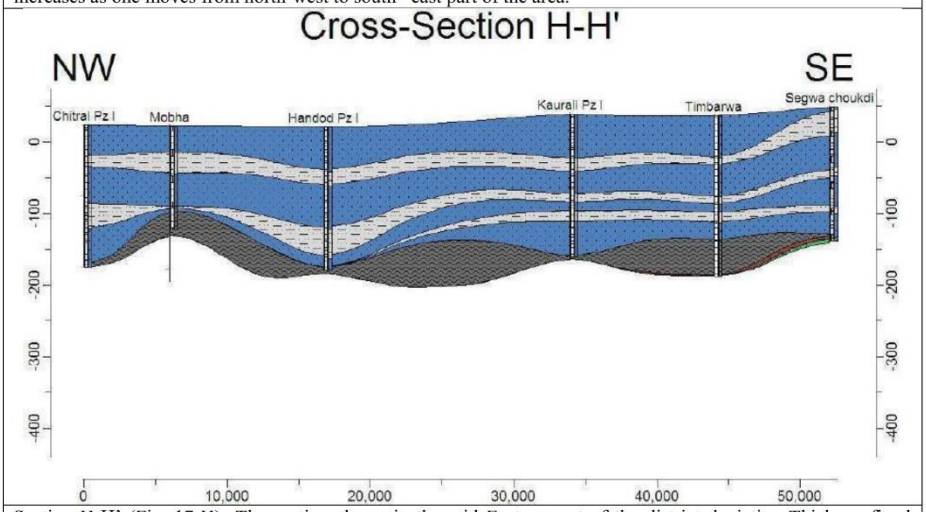


Section G-G' (Fig. 17-G)- The section shows Almost NW & SE in the extreme western part of the Vadodara district depicting continues thick aquitard occurred at ground level. It is also seen that the thickness blue clay increases as one moves from north-west to south –east part of the area.



Section H-H' (Fig. 17-H)- The section shows in the mid Eastern part of the district depicting Thick confined Aquifer I, II and III separated by thin Aquitards and below tertiary sediments (Blue Clay).

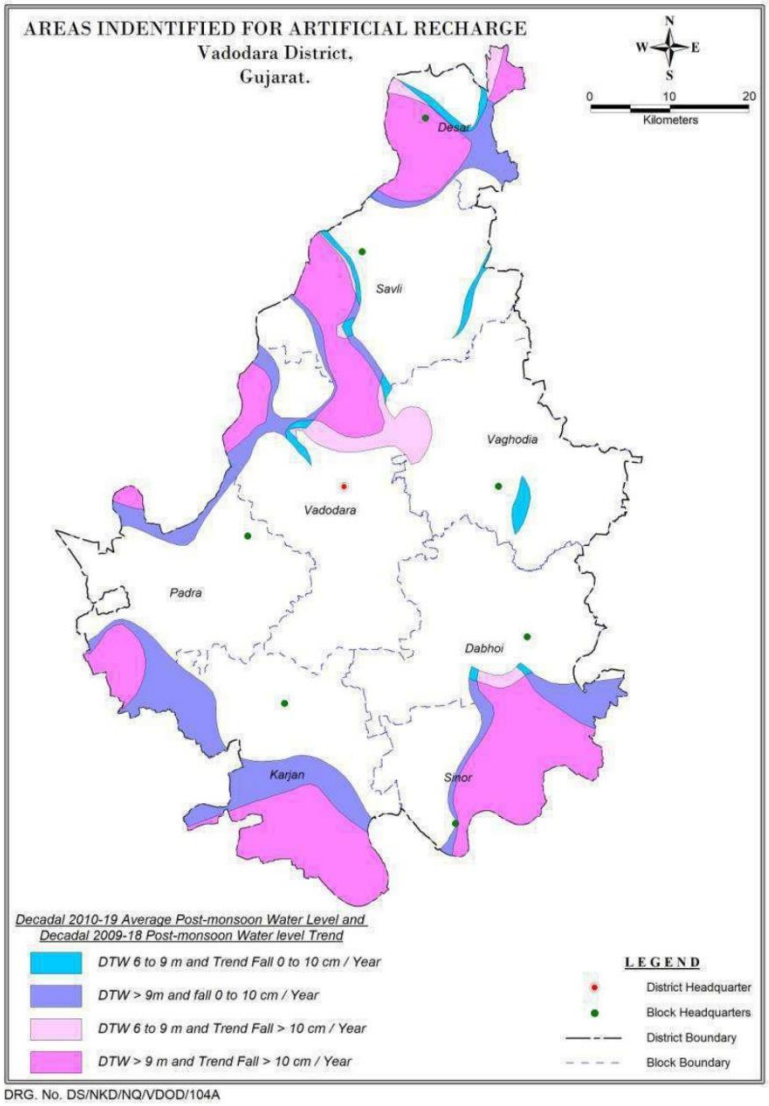


Fig. – 22: Feasible area for Artificial recharge

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Aquifer Information and Management plan of for Vadodara Block of Vadodara District, Gujarat state.

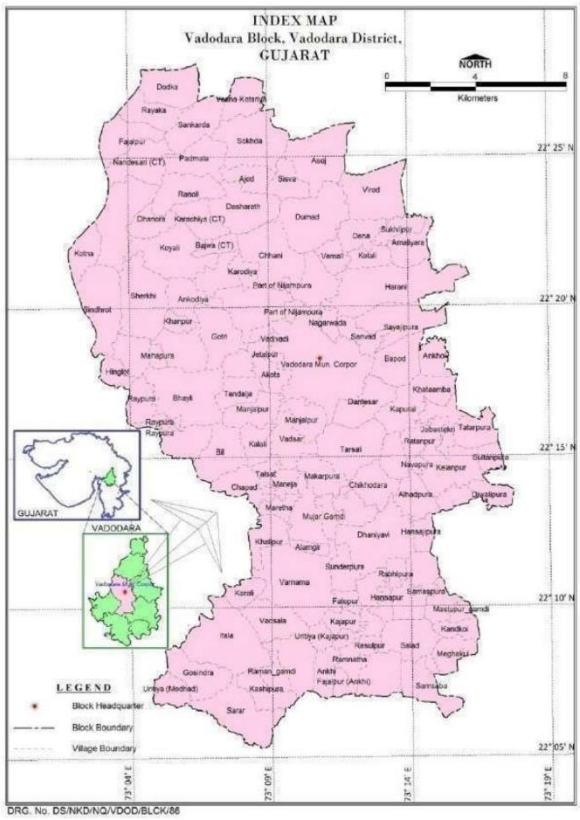
General Information

State Name : Gujarat

District name : Vadodara

Block name : Vadodara

Location



Salient Features	
Area (Km^2):	670
No of Talukas	1
No. of Villages:	82
Population:	2,71,670
Density of Population/Km^2:	405.47
Net Sown Area in ha	36595
Gross Sown Area in ha	52488
Gross Irrigated Area in ha	43798
Area Irrigated by GW (%):	41.27
Cropping Intensity (%):	143.43

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Irrigation Intensity (%):		57
Principal crops	Kharif:	Paddy,Tobacco,Bajra,Banana,Castor,Vegetables,Cotton & Pigeon pea
	Rabi:	Wheat,Potato,Tobacco,Mustard,Vegetables,Gram & Forage
	Summer:	Bajra, Paddy,Vegetables,Green Gram & Ground nut

Geographical Area : 670.00 sq. km.

Basin/Sub-basin : Major Drainages: Mahi & Tributaries of Mahi (Vishwamitri)

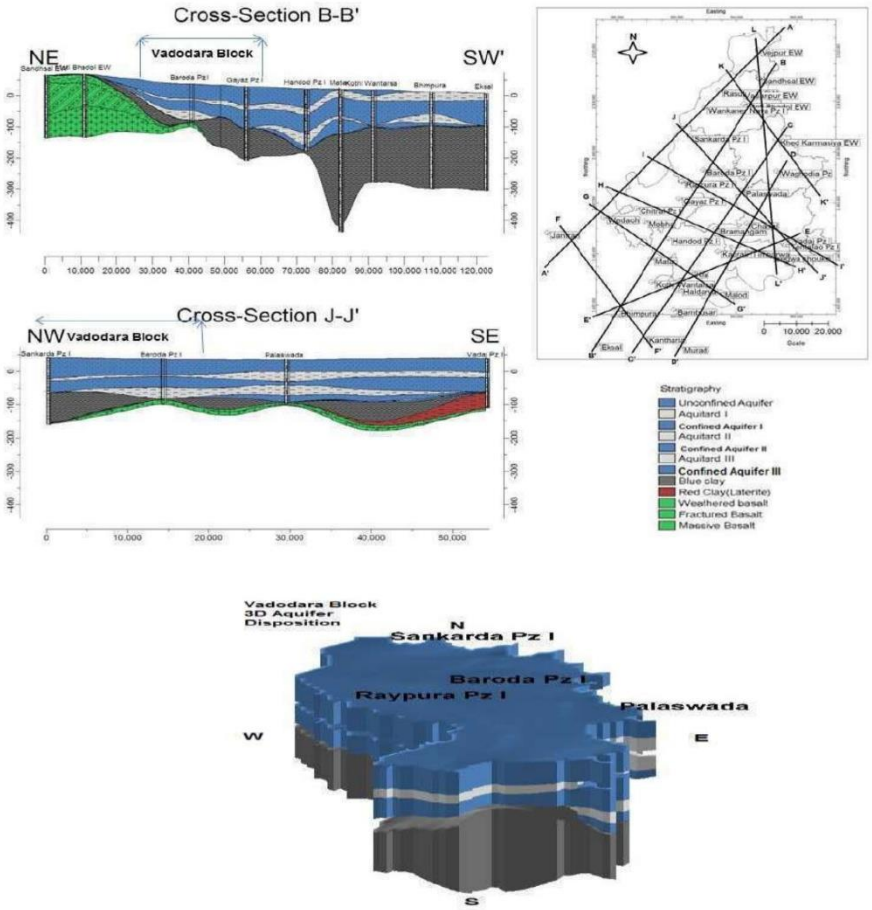
Principal Aquifer System : Alluvium

Major Aquifer System : Alluvium and Fluvial marine sediments.

Normal Annual Rainfall : 1039 mm

Aquifer Disposition

- Unconfined Aquifer Depth of occurrence 0 to 46 mbgl.
- Confined Aquifer I depth of occurrence 60 to 100 mbgl.
- Confined Aquifer II depth of occurrence 115 to 130 mbgl.



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Aquifer Characterisation and Disposition										
Stratigraphy	Formation	Aquifer Nomenclature	Depth of occurrence	Thickness	Water Level (mbgl)	Quality (TDS)	Discharge	Transmissivity	Nature of Aquifer	Remarks
			Aquifer	Range	Range	Range	Range	Range		
			(mbgl)	(m)	(mbgl)	Mg/l	lps	m2/day		
Quaternary	Alluvium	Unconfined Aquifer	0 to 46	35 to 60	3 to 38	550 to 2830	2 to 50	1.67 to 1067	Phreatic	E.C of ground water varies from less than 760 µS/cm to more than 8790 µS/cm in the Vadodara taluka.
		Confined Aquifer I	60 to 100	10 to 30	5 to 50	520 to 5630	1.2 to 60	38 to 2665	Confined	
		Confined Aquifer II	115 to 130	10 to 20	18 to 37		4 to 20	602 to2616	Confined	

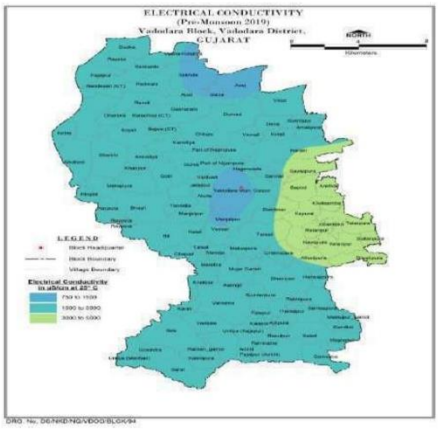
Groundwater Monitoring Status

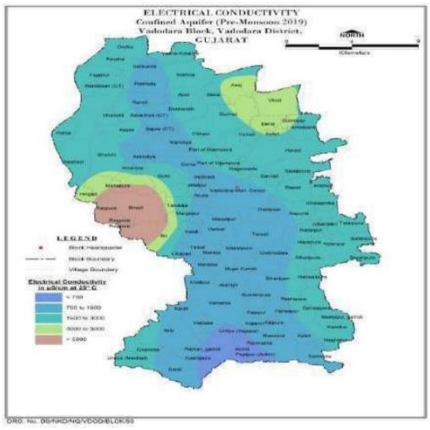
CGWB- Dug wells : 05, Piezometers :04

GWRDC- Dug wells : 05, Piezometers :09

Groundwater Quality

- The Electrical conductance of ground water is generally ranges from 760 to 8790 micromhos/cm at 25°c, for the Vadodara taluka.
- Phreatic and confined Aquifers: Potable and fit for domestic, drinking, irrigation and other industrial purposes.
- Groundwater having TDS more than 4000 ppm, and Nitrate >66 ppm is observed in localised pockets due to rapid urbanization, industrial growth nearby the Vadodara city may leads to increase in the ground water pollution level.
- Due to uncontrolled chemical wastes dumping nearby the industries, industrial effluent mixed with sewage and runoff water has arguably turned the local river Vishwamitri into big sewer, which ultimately leads to contaminate the ground water after leaching.





Summarised Chemical Data of Vadodara taluka of Vadodara District.														
Chemical Parameters	pH	EC	TH	TDS	CO3	HCO3	Cl	SO4	NO3	Ca	Mg	Na	K	F
Min	7.60	760.00	175.00	520.00	0.00	183.00	104.00	0.00	1.12	25.00	18.00	70.00	2.25	0.13
Max	8.90	8790.00	1875.00	5630.00	36.00	1220.00	1600.00	1030.00	66.00	325.00	255.00	1156.00	28.98	1.41
Average	8.20	2459.00	426.40	1582.73	9.60	400.99	487.00	168.47	8.73	88.47	49.27	363.13	8.05	0.86
* All values are in mg/l except pH and EC in µS/cm at 25°C														

Groundwater Resource

- GW Availability 15536.36 ham (Dynamic)
- GW Draft 12136.00 ham
- Stage of GW Development 78.11%
- Total Ground Water resource including both dynamic & in storage for taluka is 151211.36 ham. (Dynamic:15536.36ham & In storage: 135675 ham)

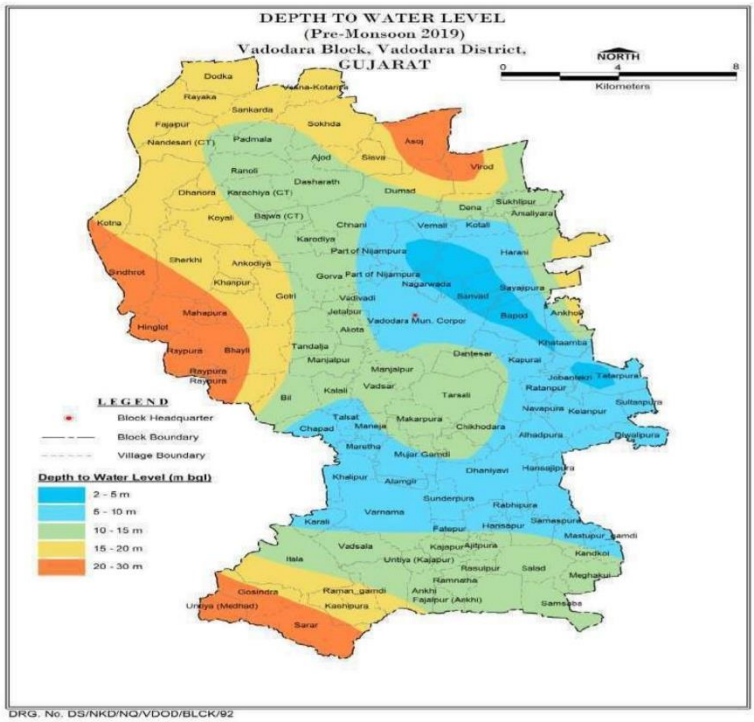
Existing and Future Water Demand

- Present demand for All Usage: 12136.00 ham.
- Annual Ground Water allocation for Domestic use as on 2025 is 343.00 ham.
- Net Ground Water availability for future use is 4378.36 ham.

Aquifer Management plan

Groundwater Management Issues

- The long term groundwater regime monitoring studies through NHS reveal an overall declining trend in major parts of the Vadodara taluka. The decline in range is 0.002 to 0.15 m /year.
- But in some areas after commencement of Narmada Canal based irrigation, little rising trend is observed in long term water level analysis (last 10 years) of both Phreatic and Confined Aquifers.
- Groundwater having TDS more than 4000 ppm, and Nitrate >66 ppm is observed in localised pockets due to rapid urbanization, industrial growth nearby the Vadodara city may leads to increase in the ground water pollution level.



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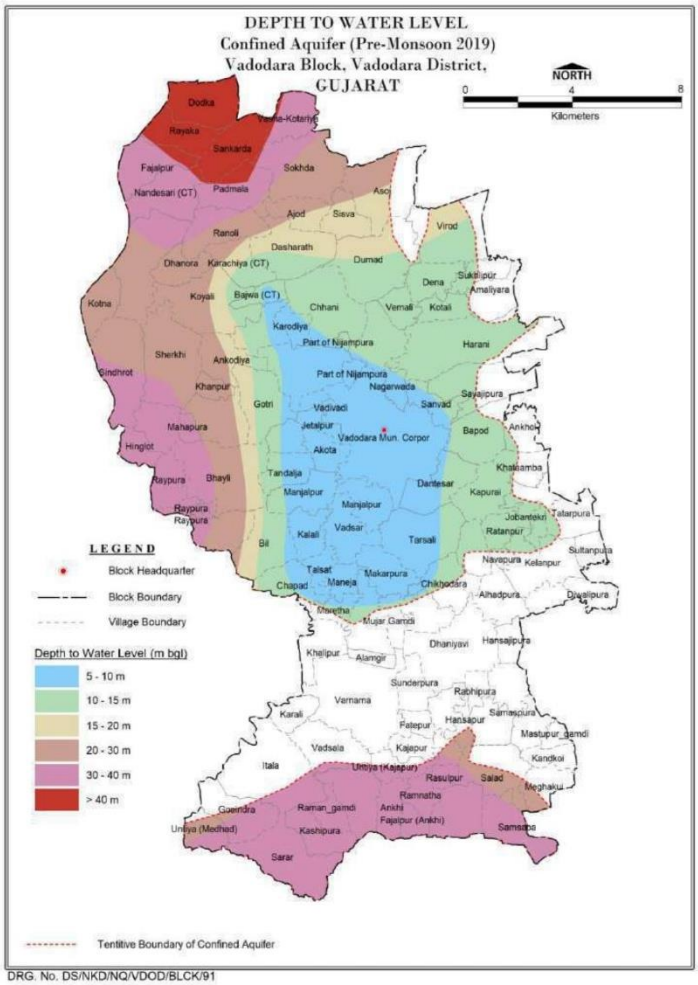
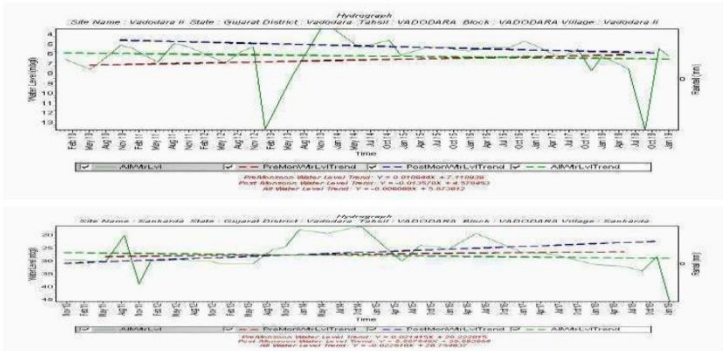


DRG. No. DS/NKD/NQ/VDOD/BLCK/91



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Groundwater Management Plan

- **Supply side Management Plan**
  As per Masterplan 2020 for Artificial Recharge to Ground Water in Gujarat state, 3.27 MCM of surplus surface water is provisioned for artificial recharge through 92 no of recharge shafts and 17 no of existing defunct tube wells which can be used as injection wells in Vadodara taluka of Vadodara district .Ground water recharge of 105.20 ham (through recharge shafts and defunct tube wells) is expected for the taluka.
- **Demand side management Plan**
  944 Ha area is proposed for on farm activities (Laser levelling/Bench terracing/Contour banding) and 1070 no of farm ponds are recommended which will serve dual purpose of irrigation and recharge to ground water.3830 Ha area is proposed for Micro irrigation system (Sprinkler/drip) in Vadodara taluka.Ground water recharge of 94.4 ham (through on farm activities and GW return flow) is expected for the Vadodara taluka.953.21 ham saving of ground water through WUE measures & farm ponds activities is expected for the Vadodara taluka.
- **Outcome**
  Projected stage of Ground Water development after additional conservation activities is 70 % (Safe category) in the Vadodara Block.

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Aquifer Information and Management plan of for Vadodara City of Vadodara District, Gujarat state.

General Information

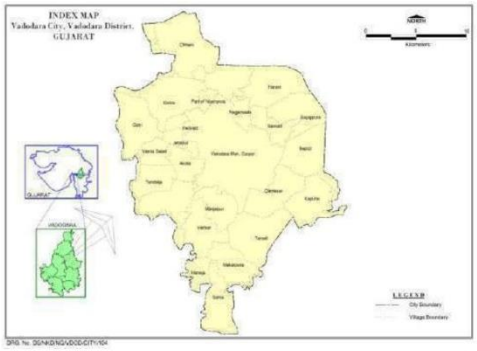
State Name : Gujarat

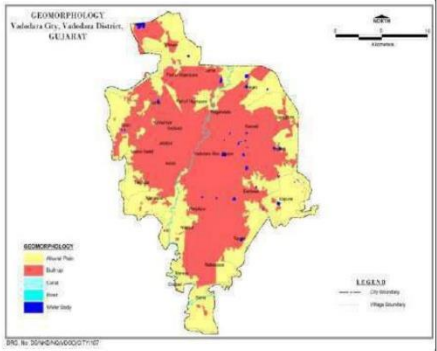
District name : Vadodara

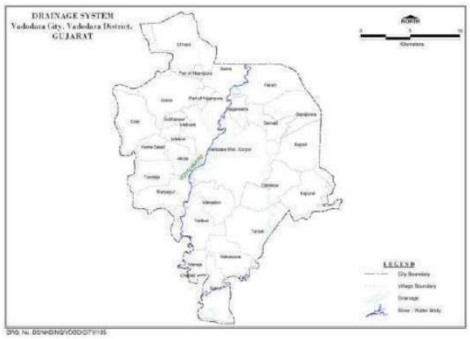
Block name : Vadodara

City Name : Vadodara

Location







Salient Features of Vadodara City	
Area (Km^2):	156.6
Population (Census 2011)	20,65,771
Density of Population/Km^2:	13191
Urban House hold Number (Census 2011)	4,59,509
Altitude(MASL)	35.5
Present Scenario of Water Supply Scheme of Vadodara City (Source Vadodara Municipal Corporation)	
Ajwa/Nimeta (Dam)	145 MLD
Radial Collector Well	250 MLD
Tube Wells (46 tube wells in City and 23 tube wells in River mahi)	25 MLD
Khanpur	37 MLD
Total	457 MLD
Per Capita supply	210 lpcd

Geographical Area : 156.6 sq. km.

Basin/Sub-basin : Major Drainages: Mahi & Tributaries of Mahi (Vishwamitri)

Principal Aquifer System : Quaternary Alluvium

Major Aquifer System : Alluvium and Fluvial marine sediments.

Normal Annual Rainfall : 845 mm

Aquifer Disposition

- Unconfined Aquifer Depth of occurrence 0 to 40 mbgl.
- Confined Aquifer I depth of occurrence 51 to 83 mbgl.

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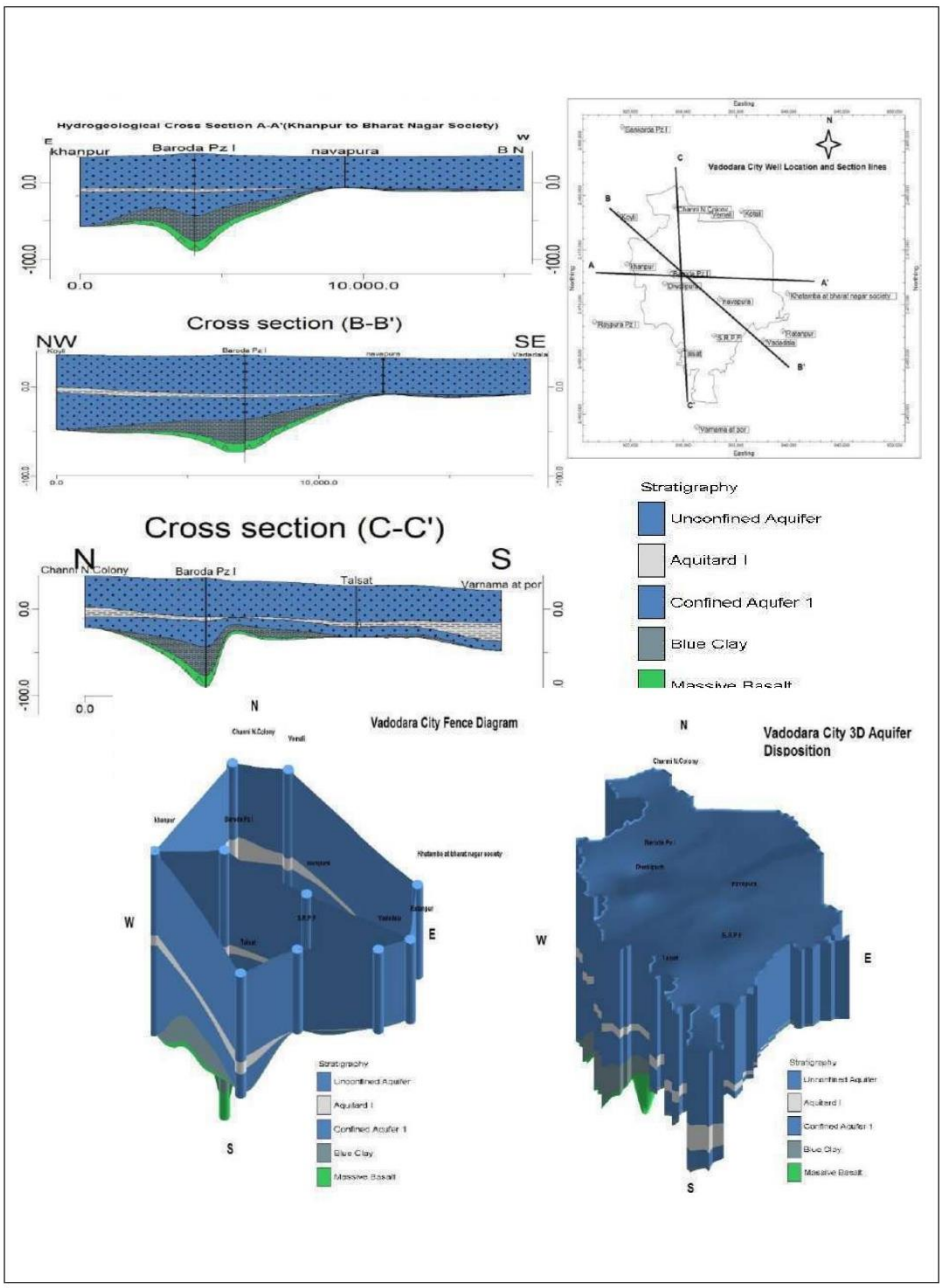
Hydrogeological Cross Section A-A'(Khanpur to Bharat Nagar Society)
E
W
Khanpur
Baroda Pz I
navapura
B N
0.0
-100.0
0.0
10,000.0
Cross section (B-B')
NW
SE
Cross section (C-C')
N
S
Channi N Colony
Baroda Pz I
Talsat
Varnama at por
Vadodara City Well Location and Section lines
Stratigraphy
Unconfined Aquifer
Aquitard I
Confined Aquifer 1
Blue Clay
Massive Basalt
Vadodara City Fence Diagram
Vadodara City 3D Aquifer Disposition
W
E
S
N

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Aquifer Characterisation and Disposition										
Stratigraphy	Formation	Aquifer Nomenclature	Depth of occurrence	Thickness	Water Level (mbgl)	Quality (TDS)	Discharge	Transmissivity	Nature of Aquifer	Remarks
			Aquifer	Range	Range	Range	Range	Range		
			(mbgl)	(m)	(mbgl)	Mg/l	lps	m2/day		
Quaternary	Alluvium	Unconfined Aquifer	0 to 40	35 to 40	5 to 28	392 to 4490	2 to 50	1.67 to 1067	Phreatic	Ground water TDS varies from 392 to 4490 in the Vadodara City.
		Confined Aquifer I	51 to 83	10 to 20	5 to 35	360 to 5370	1.2 to 60	38 to 2665	Confined	

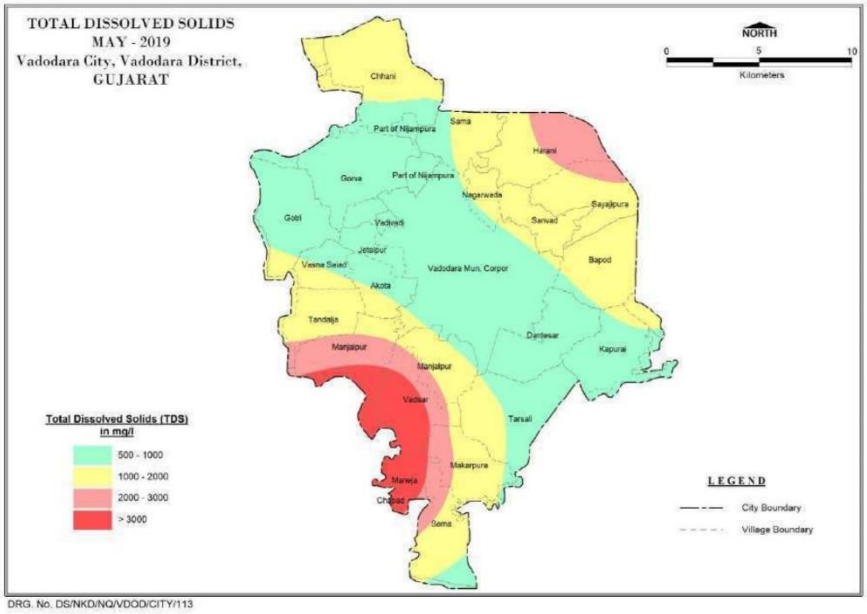
Groundwater Monitoring Status

CGWB- Dug wells : 03, Piezometers :02

GWRDC- Dug wells : 02, Piezometers :02

Groundwater Quality

- The TDS of ground water is generally ranges from 392 to 4490 ppm for the Vadodara City.
- Phreatic and confined Aquifers: Potable and fit for domestic, drinking, irrigation and other industrial purposes.
- Groundwater having TDS more than 4000 ppm, Nitrate >90 ppm and Fluoride having more than 2.1 ppm is observed in localised pockets due to rapid urbanization, industrial growth nearby the Vadodara city may leads to increase in the ground water pollution level.
- Due to uncontrolled chemical wastes dumping nearby the industries, industrial effluent mixed with sewage and runoff water has arguably turned the local river Vishwamitri into big sewer, which ultimately leads to contaminate the ground water after leaching.



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Vadodara City Water Quality Data						
	Chemical Parameters					
	TDS	**Total Hard.**	**Cl**	**No3**	**F**	**Alk**
Min	392	104	68	0.8	0.22	208
Max	4490	976	2052	91.11	2.06	667
Average	1030	313	301	21	1	391

Groundwater Resource (City-Vadodara GWRE 2017)

- GW Availability 3487.00 ham (Dynamic)
- GW Draft 3181.00 ham
- Stage of GW Development 91.24 %

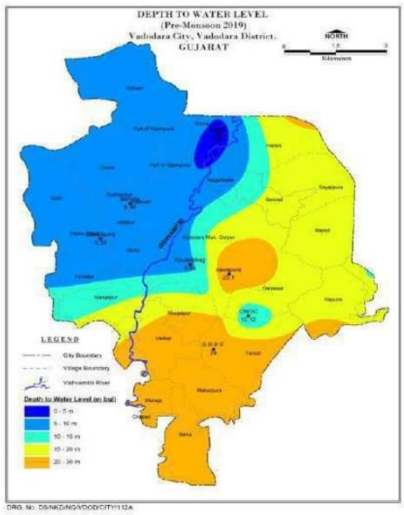
Existing and Future Water Demand (City-Vadodara GWRE 2017)

- Present demand for All Usage: 3181.00 ham.
- Projected demand for domestic and Industrial uses up to 2025 is 6699.00 ham.
- Net Ground Water availability for future use is 00.00 ham.

Aquifer Management plan

Groundwater Management Issues

- The long term groundwater regime monitoring studies through NHS reveal an overall declining trend in major parts of the Vadodara City. The decline in range is 0.002 to 0.15 m /year.
- Groundwater having TDS more than 4000 ppm, Nitrate >90 ppm and Fluoride having more than 2.1 ppm is observed in localised pockets due to rapid urbanization, industrial growth nearby the Vadodara city may leads to increase in the ground water pollution level.



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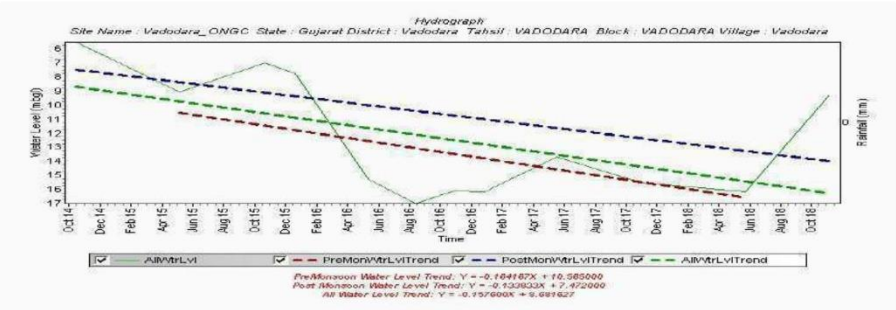
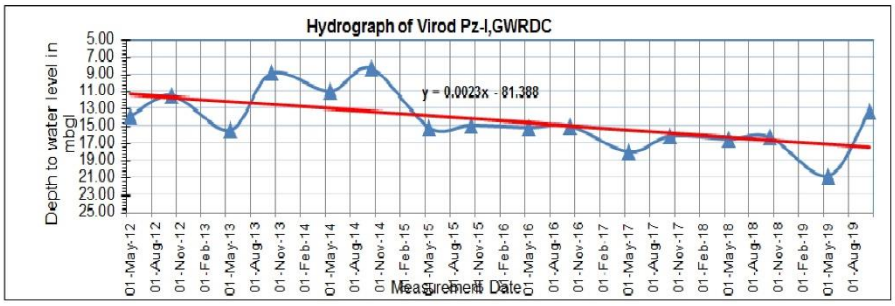




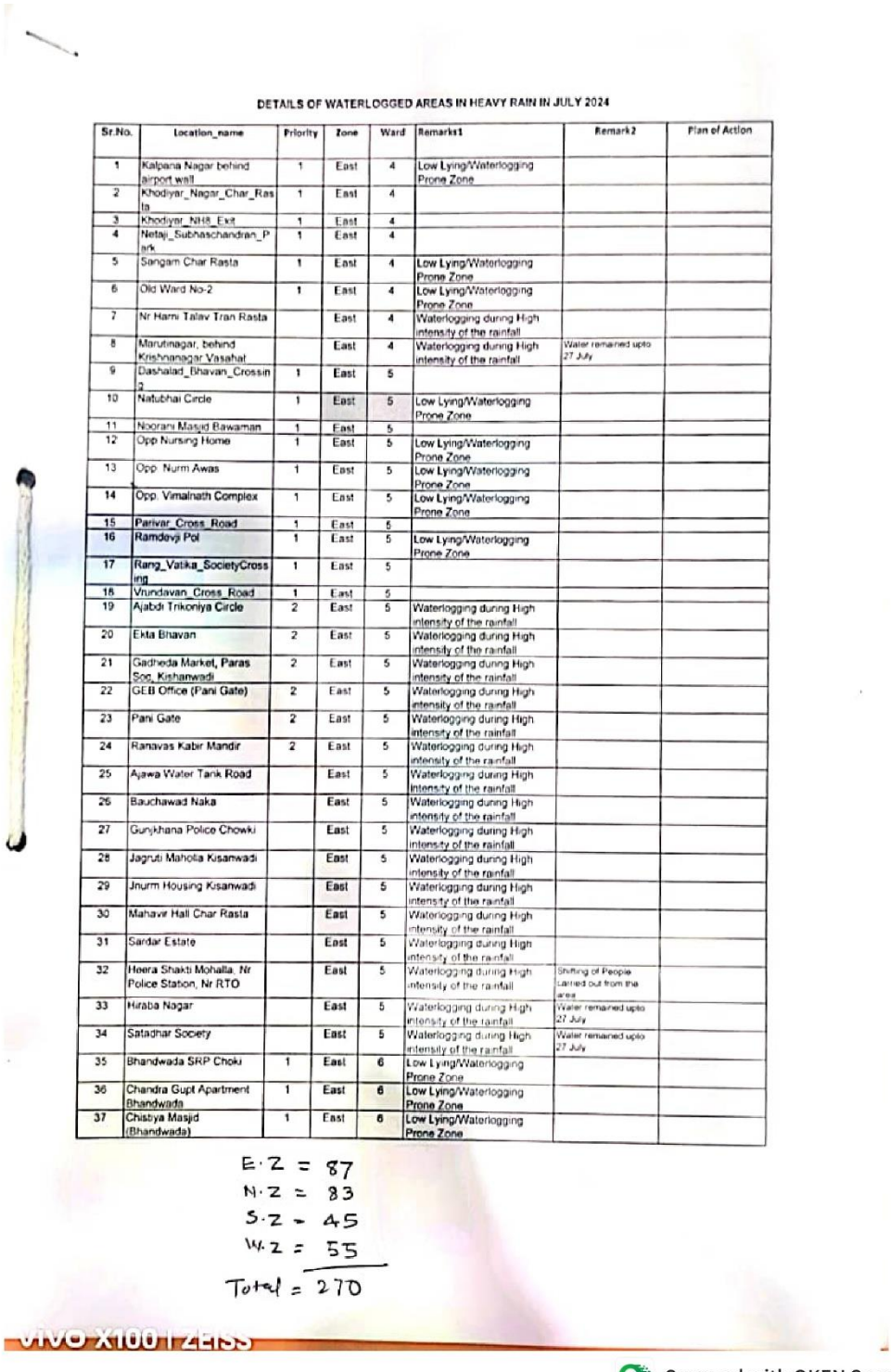
Groundwater Management Plan

There are about 20, 65,771 people resides in the Vadodara City urban area of the Vadodara district. There are about 4, 59,509 number urban households are present in Vadodara city and considering about 25% houses are suitable for harvesting and considering 40 sq. as typical house hold roof top area the total area available for harvesting (90% of total roof top) has been estimated to be 41,35,581 sq. m. The source water available for harvesting has been taken as 60% of normal rainfall in the Vadodara City urban centre after making allowance for storm rain etc., Thus, the total source water available for harvesting has been estimated as 2.10 MCM/yr. The Average cost of making the roof top harvesting arrangements for storing it at surface and recharging to ground water is @ Rs. 20,000/- per house. Thus, the cost of roof top harvesting for 1, 14,877 Number of houses of the Vadodara city is estimated as Rs. 229.75 crores.

AR & Conservation Possibilities

Ground water resources in the Vadodara City should be augmented by through Roof Top Rain Water Recharge structure and it would lead to saving 2.10 MCM of ground water and improve stage of ground water of Vadodara city from critical (91.24%) to Semi Critical category (86.05%).

Annexure XIV: Waterlogging Locations of July 2024 within VMC Limits.



DETAILS OF WATERLOGGED AREAS IN HEAVY RAIN IN JULY 2024

Sr.No.	Location_name	Priority	Zone	Ward	Remarks1	Remark2	Plan of Action
1	Kalpana Nagar behind airport wall	1	East	4	Low Lying/Waterlogging Prone Zone		
2	Khodiyar_Nagar_Char_Rasta	1	East	4			
3	Khodiyar_NH8_Exit	1	East	4			
4	Netaji_Subhaschandran_Park	1	East	4			
5	Sangam Char Rasta	1	East	4	Low Lying/Waterlogging Prone Zone		
6	Old Ward No-2	1	East	4	Low Lying/Waterlogging Prone Zone		
7	Nr Harni Talav Tran Rasta		East	4	Waterlogging during High intensity of the rainfall		
8	Marutinagar, behind Krishnanagar Vasahat		East	4	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
9	Dashalad_Bhavan_Crossing2	1	East	5			
10	Natubhai Circle	1	East	5	Low Lying/Waterlogging Prone Zone		
11	Noorani Masjid Bawaman	1	East	5			
12	Opp Nursing Home	1	East	5	Low Lying/Waterlogging Prone Zone		
13	Opp. Nurm Awas	1	East	5	Low Lying/Waterlogging Prone Zone		
14	Opp. Vimalnath Complex	1	East	5	Low Lying/Waterlogging Prone Zone		
15	Parivar_Cross_Road	1	East	5			
16	Ramdevji Pol	1	East	5	Low Lying/Waterlogging Prone Zone		
17	Rang_Vatika_SocietyCrossing	1	East	5			
18	Vrundavan_Cross_Road	1	East	5			
19	Ajabdi Trikoniya Circle	2	East	5	Waterlogging during High intensity of the rainfall		
20	Ekta Bhavan	2	East	5	Waterlogging during High intensity of the rainfall		
21	Gadheda Market, Paras Soc, Kishanwadi	2	East	5	Waterlogging during High intensity of the rainfall		
22	GEB Office (Pani Gate)	2	East	5	Waterlogging during High intensity of the rainfall		
23	Pani Gate	2	East	5	Waterlogging during High intensity of the rainfall		
24	Ranavas Kabir Mandir	2	East	5	Waterlogging during High intensity of the rainfall		
25	Ajawa Water Tank Road		East	5	Waterlogging during High intensity of the rainfall		
26	Bauchawad Naka		East	5	Waterlogging during High intensity of the rainfall		
27	Gunjkhana Police Chowki		East	5	Waterlogging during High intensity of the rainfall		
28	Jagruti Maholla Kisanwadi		East	5	Waterlogging during High intensity of the rainfall		
29	Jnurm Housing Kisanwadi		East	5	Waterlogging during High intensity of the rainfall		
30	Mahavir Hall Char Rasta		East	5	Waterlogging during High intensity of the rainfall		
31	Sardar Estate		East	5	Waterlogging during High intensity of the rainfall		
32	Heera Shakti Mohalla, Nr Police Station, Nr RTO		East	5	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
33	Hiraba Nagar		East	5	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
34	Satadhar Society		East	5	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
35	Bhandwada SRP Choki	1	East	6	Low Lying/Waterlogging Prone Zone		
36	Chandra Gupt Apartment Bhandwada	1	East	6	Low Lying/Waterlogging Prone Zone		
37	Chistiya Masjid (Bhandwada)	1	East	6	Low Lying/Waterlogging Prone Zone		

E·Z = 87
N·Z = 83
S·Z = 45
W.Z = 55
Total = 270

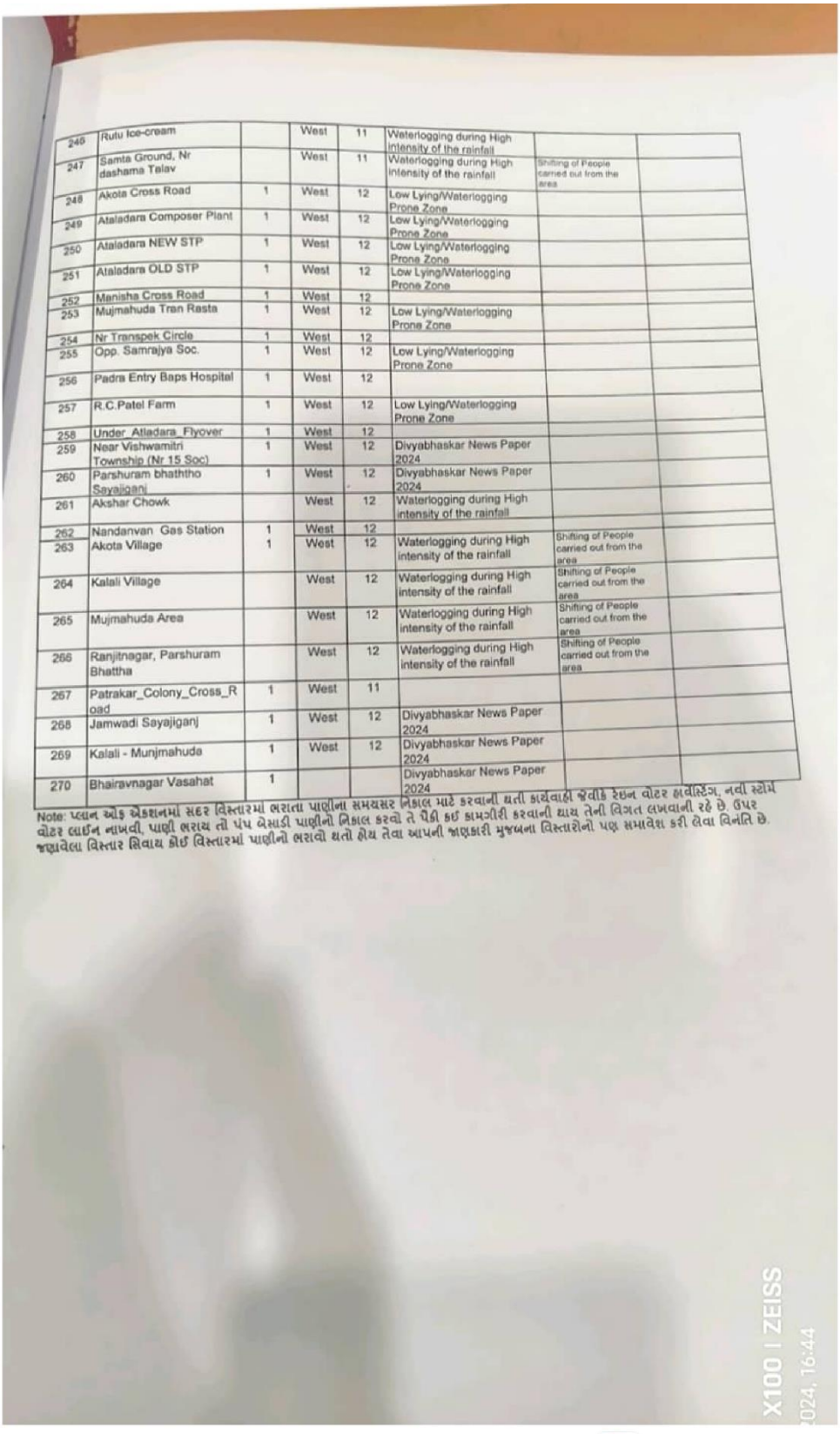
38	Dudh Dhayaward Masjid Tran Rasta	1	East	6	Low Lying/Waterlogging Prone Zone		
39	Khodiyar Mandir (Bhandwada)	1	East	6	Low Lying/Waterlogging Prone Zone		
40	Madi Mohalla (Bhandwada)	1	East	6	Low Lying/Waterlogging Prone Zone		
41	Madina Masjid (Bhandwada)	1	East	6	Low Lying/Waterlogging Prone Zone		
42	Padakhana Kumbarwada	1	East	6	Low Lying/Waterlogging Prone Zone		
43	Sarasiya talav	1	East	6			
44	Vrundavan apartment	1	East	6	Low Lying/Waterlogging Prone Zone		
45	A1 Soda Shop (Hathikhana to fatehpura Road)		East	6	Waterlogging during High intensity of the rainfall		
46	Adaniya Pool		East	6	Waterlogging during High intensity of the rainfall		
47	Hathi Khana Beli Bazar Naka		East	6	Waterlogging during High intensity of the rainfall		
48	Kharitalavdi		East	6	Waterlogging during High intensity of the rainfall		
49	Lal Akhada		East	6	Waterlogging during High intensity of the rainfall		
50	Mangleshwar Zampa mahakali Mandir (Hadkai Mata Mandir)		East	6	Waterlogging during High intensity of the rainfall		
51	Meldi Mata Temple, Khan Talavdi, Kumbharwada		East	6	Waterlogging during High intensity of the rainfall		
52	Nilambar Cross Road		East	6	Waterlogging during High intensity of the rainfall		
53	Nr Old RTO, Opp Police Station, Warasiya		East	6	Waterlogging during High intensity of the rainfall		
54	Opp. Iskon Temple, Harinagara, Gotri Road		East	6	Waterlogging during High intensity of the rainfall		
55	Pitambar Pole		East	6	Waterlogging during High intensity of the rainfall		
56	Ramapir Mohalla, Behind LIC davakhan, varasia		East	6	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
57	Ektanagar, Kumbharwada		East	6	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
58	Dudhvada_Maholla	1	East	14			
59	Junighadi_Harijan_Niwas	1	East	14			
60	Bhagat sing chowk		East	14	Waterlogging during High intensity of the rainfall		
61	Central Workshop		East	14	Waterlogging during High intensity of the rainfall		
62	Chapaner Gate		East	14	Waterlogging during High intensity of the rainfall		
63	Collector Office		East	14	Waterlogging during High intensity of the rainfall		
64	Gendi Gate		East	14	Waterlogging during High intensity of the rainfall		
65	Jamna Bai Gali		East	14	Waterlogging during High intensity of the rainfall		
66	Kalupura Sudhrai Store		East	14	Waterlogging during High intensity of the rainfall		
67	Laheripura Gate		East	14	Waterlogging during High intensity of the rainfall		
68	Mandavi Gate		East	14	Waterlogging during High intensity of the rainfall		
69	Mangal Bazar		East	14	Waterlogging during High intensity of the rainfall		
70	Mohanlal Chawata		East	14	Waterlogging during High intensity of the rainfall		
71	Office Of Collector (Kothi)		East	14	Waterlogging during High intensity of the rainfall		
72	OPP ICICI Bank Dhudh Wala Mohlla		East	14	Waterlogging during High intensity of the rainfall		
73	Pouwa wali gali, Chapaner darwaja,		East	14	Waterlogging during High intensity of the rainfall		
74	Rajpurani Pole		East	14	Waterlogging during High intensity of the rainfall		
75	Shamad Bechar		East	14	Waterlogging during High intensity of the rainfall		

76	Sursagar Lake		East	14	Waterlogging during High intensity of the rainfall		
77	UCO Bank (Panigate Bavachawad)		East	14	Waterlogging during High intensity of the rainfall		
78	Old Ward No-1		East	14	Waterlogging during High intensity of the rainfall		
79	Bawamanpoor Noor Appartment	1	East	15	Low Lying/Waterlogging Prone Zone		
80	Mahendi Nagar Naka	1	East	15	Low Lying/Waterlogging Prone Zone		
81	Opp. Saptashungi Mata Temple	1	East	15	Low Lying/Waterlogging Prone Zone		
82	Shashtri Baug	1	East	15	Low Lying/Waterlogging Prone Zone		
83	Vimavada Dava Khana	1	East	15	Low Lying/Waterlogging Prone Zone		
84	Pushtidwar Society		East	15	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
85	Vaikunth-1		East	15	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
86	Aditya Heights Waghodia Road	1	East	16	Divyabhaskar News Paper 2024		
87	Pratham Residancy Waghodia Road	1	East	16	Divyabhaskar News Paper 2024		
88	Ravi Shikhar Sokhda Road	1	North	1			
89	Amarnagar_Char_Rasta	1	North	1			
90	Bajwa_CheckPost	1	North	1			
91	Gujarati_Primary_School Chhani	1	North	1			
92	PakaKot_Bhathiji_Temple	1	North	1			
93	Roshannagar_Tran_Rasta	1	North	1			
94	Ramakaka Dairy	2	North	1	Waterlogging during High intensity of the rainfall		
95	Deluxe Char Rasta	1	North	2			
96	Sama Sport Complex	1	North	2	Low Lying/Waterlogging Prone Zone		
97	Sama Gam Navanagan	1	North	2	Divyabhaskar News Paper 2024		
98	Nizampura Atithi Gruh, Nr. Sewage Pumping Stat	2	North	2	Waterlogging during High intensity of the rainfall		
99	Chhani Jakat Naka		North	2	Waterlogging during High intensity of the rainfall		
100	Military Boys Hostel		North	2	Waterlogging during High intensity of the rainfall		
101	Kalptaru Crossing	1	North	3	Low Lying/Waterlogging Prone Zone		
102	Kalyan Nagar Bridge, Tower	1	North	3	Low Lying/Waterlogging Prone Zone		
103	Lion Circle	1	North	3			
104	S.T. Bus Depot	1	North	3	Low Lying/Waterlogging Prone Zone		
105	TP-11, Nizampura Road	1	North	3	Low Lying/Waterlogging Prone Zone		
106	Yash Complex Char Rasta	1	North	3	Low Lying/Waterlogging Prone Zone		
107	Jalaram Seva Vasti	1	North	3	Divyabhaskar News Paper 2024		
108	Navyug Vidhyalay Fateganj	1	North	3	Divyabhaskar News Paper 2024		
109	Sayaji Society Bridge	2	North	3	Waterlogging during High intensity of the rainfall		
110	Sayajibuag Garden Office	2	North	3	Waterlogging during High intensity of the rainfall		
111	Nr. Nataraj Talkies		North	3	River Flooding		
112	Pandiya Bridge		North	3	River Flooding		
113	Parth school, Nr. Ratribazar Bridge		North	3	River Flooding		
114	Airforce Station Gate		North	3	Waterlogging during High intensity of the rainfall		
115	Amit Nagar Circle		North	3	Waterlogging during High intensity of the rainfall		
116	Govind nagar bridge		North	3	Waterlogging during High intensity of the rainfall		

117	Manek park opp Airport side		North	3	Waterlogging during High intensity of the rainfall		
118	Narhari Hospital Circle 1		North	3	Waterlogging during High intensity of the rainfall		
119	Nr. Revival Hotel, Sayajigunj		North	3	Waterlogging during High intensity of the rainfall		
120	Sayajibaug Amul Parlour		North	3	Waterlogging during High intensity of the rainfall		
121	Sayajibaug Commissioner house		North	3	Waterlogging during High intensity of the rainfall		
122	Sayajibaug Music Room		North	3	Waterlogging during High intensity of the rainfall		
123	Sayajibaug Water Tank		North	3	Waterlogging during High intensity of the rainfall		
124	Sama Village, navi Nagari		North	3	Waterlogging during High intensity of the rainfall	Water remained upto 26 July	
125	_Ghee_Kanta_Road_Masjid	1	North	7			
126	Diwalipura Garden	1	North	7	Low Lying/Waterlogging Prone Zone		
127	Iscon Temple	1	North	7	Low Lying/Waterlogging Prone Zone		
128	Lalpkua_Shakmarket	1	North	7			
129	Mangleshwar Bridge	1	North	7	Low Lying/Waterlogging Prone Zone		
130	Mangleshwar Zampa Road	1	North	7	Low Lying/Waterlogging Prone Zone		
131	Motibaug Top Tran Rasta	1	North	7	Low Lying/Waterlogging Prone Zone		
132	Nawabwada_Naka	1	North	7			
133	Tulsi Vadi Bridge	1	North	7	Low Lying/Waterlogging Prone Zone		
134	Tulsiwadi Dhal Utarta	1	North	7	Low Lying/Waterlogging Prone Zone		
135	Indiranagar Vasahat	1	North	7	Divyabhaskar News Paper 2024		
136	Near Kasamaala Kabrastan Vasahat (Karelibaug)	1	North	7	Divyabhaskar News Paper 2024		
137	SSG Hospital Gate 1	2	North	7	Waterlogging during High intensity of the rainfall		
138	Sadhna nagar Society		North	7	Low Lying/Waterlogging Prone Zone		
139	Bahuchraji Bridge		North	7	River Flooding		
140	Bahuchraji Tower Area		North	7	River Flooding		
141	Rain Basera (Balvadi)		North	7	River Flooding		
142	Karelibaug Water Tank		North	7	Waterlogging during High intensity of the rainfall		
143	Kasham Alla Bridge		North	7	Waterlogging during High intensity of the rainfall		
144	Nishad Complex		North	7	Waterlogging during High intensity of the rainfall		
145	Nr Sarda Mandir School		North	7	Waterlogging during High intensity of the rainfall		
146	Prakash Nagar Naka		North	7	Waterlogging during High intensity of the rainfall		
147	Raneshwar Petrol Pump		North	7	Waterlogging during High intensity of the rainfall		
148	Old Ward No-8		North	7	Waterlogging during High intensity of the rainfall		
149	Nava Yard Char Rasta	2	North	12	Waterlogging during High intensity of the rainfall		
150	Dandiya_Bazar_VGLOffice	1	North	13			
151	Gangotri Apartment	1	North	13			
152	Kashivishwanath_Temple	1	North	13			
153	Muktanand_Tran_Rasta_	1	North	13			
154	Nr_Idgah_Maidan	1	North	13			
155	Raj Mahal Road	1	North	13			
156	Sayaji_Ganj_Dairy_Den_Circle	1	North	13			
157	Subhashnagar Vasahat	1	North	13	Divyabhaskar News Paper 2024		
158	Char Mata	2	North	13	Waterlogging during High intensity of the rainfall		

159	Jayraina	2	North	13	Waterlogging during High intensity of the rainfall		
160	Lalbaug Cattle Pond	2	North	13	Waterlogging during High intensity of the rainfall		
161	Nr AlpanaTalkies	2	North	13	Waterlogging during High intensity of the rainfall		
162	S S C Board	2	North	13	Waterlogging during High intensity of the rainfall		
163	Shakti Krupa Circle	2	North	13	Waterlogging during High intensity of the rainfall		
164	Vihar Cinema	2	North	13	Waterlogging during High intensity of the rainfall		
165	Kala Ghoda Circle		North	13	River Flooding		
166	Khaswadi Bridge		North	13	Waterlogging during High intensity of the rainfall		
167	Nani Shak market,Chokhandi Tran Rasta, Opp.Lalabhai Kachoriwala		North	13	Waterlogging during High intensity of the rainfall		
168	Palace Mutton Shop		North	13	Waterlogging during High intensity of the rainfall		
169	Salatvada		North	13	Waterlogging during High intensity of the rainfall		
170	Kamnath mahadev Area		North	13	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
171	Gurukul circle	1	South	16			
172	Nr Swaminarayan Mandir Wadi	1	South	16			
173	Sewage Pumping Road (Gajrawadi)	1	South	16			
174	Shrinath Vidyalaya	1	South	16			
175	Waghodia_D_Mart	1	South	16			
176	Nr. Tarsali Talav, Tarsali	2	South	16	Waterlogging during High intensity of the rainfall		
177	Tarsali Sardar Patel	2	South	16	Waterlogging during High intensity of the rainfall		
178	Dabhoi Chowkdi		South	16	Waterlogging during High intensity of the rainfall		
179	Dabhoi Road		South	16	Waterlogging during High intensity of the rainfall		
180	Gajarawadi STP		South	16	Waterlogging during High intensity of the rainfall		
181	Gurunanak school crossing		South	16	Waterlogging during High intensity of the rainfall		
182	Soma Talav Char Rasta 1		South	16	Waterlogging during High intensity of the rainfall		
183	Hanuman Tekri Slum		South	16	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
184	Pratham Residancy		south	16	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
185	Aditya Heights		south	16	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
186	Sainathnagar		south	16	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
187	Dip_Complex	1	South	17			
188	Satya_Sai_Baba_Circle	1	South	17			
189	Tarsali Bus Stand	2	South	17	Waterlogging during High intensity of the rainfall		
190	Bhimnath Bridge		South	17	Waterlogging during High intensity of the rainfall		
191	Gorwa Iti Char Rasta		South	17	Waterlogging during High intensity of the rainfall		
192	Shanti Nagar Society, Community Hall, Tarsali		South	17	Waterlogging during High intensity of the rainfall		
193	Shreyas School Tran Rasta		South	17	Waterlogging during High intensity of the rainfall		
194	Alwanaka_Tran_Rasta	1	South	18			
195	Kewal_Chokdi	1	South	18			
196	Kubereshwar_School	1	South	18			
197	Manjalpur Muktidham	1	South	18			
198	Raza Masjid	1	South	18			
199	Suncity_Circle Manjalpur	1	South	18			
200	Kasa Residancy Vadsar	1	South	18	Divyabhaskar News Paper 2024		

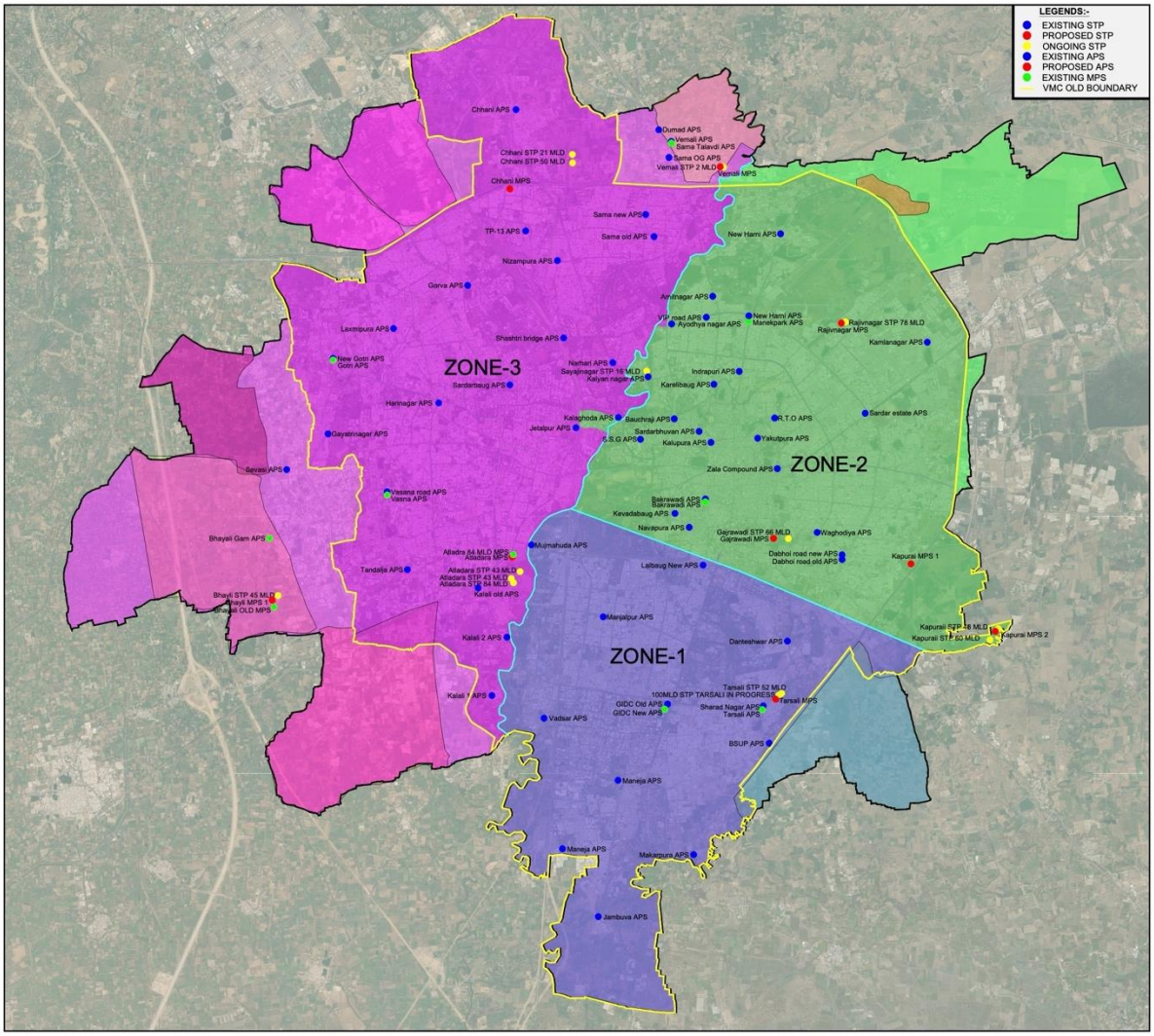
201	GIDC FS		South	18	Waterlogging during High intensity of the rainfall		
202	Jay Amba School Manjalpur		South	18	Waterlogging during High intensity of the rainfall		
203	Jhansi Ki Rani Circle		South	18	Waterlogging during High intensity of the rainfall		
204	Jupiter Char Rasta		South	18	Waterlogging during High intensity of the rainfall		
205	Kanchan Ganga		South	18	Waterlogging during High intensity of the rainfall		
206	Kirti Stambh		South	18	Waterlogging during High intensity of the rainfall		
207	Makarpura GIDC Bridge		South	18	Waterlogging during High intensity of the rainfall		
208	Susan Circle		South	18	Waterlogging during High intensity of the rainfall		
209	Old Ward No-12		South	18	Waterlogging during High intensity of the rainfall		
210	Vasdar Koteshwar		south	18	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
211	Jambuva Gam	1	South	19	Divyabhaskar News Paper 2024		
212	Maneja	1	South	19	Divyabhaskar News Paper 2024		
213	Tarsali Check Post		South	19	Waterlogging during High intensity of the rainfall		
214	Tarsali Road		South	19	Waterlogging during High intensity of the rainfall		
215	Shubh Bunglows, Jambuwa		south	19	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
216	Alkapun Road Nr. Railway Station	1	West	8	Low Lying/Waterlogging Prone Zone		
217	Alkapuri Under Pass	1	West	8	Low Lying/Waterlogging Prone Zone		
218	BOB_HO	1	West	8			
219	Genda Circle	1	West	8	Low Lying/Waterlogging Prone Zone		
220	Gorwa_ShakMarket	1	West	8			
221	Jetalpur_Flyover	1	West	8			
222	Punchwali_Circle	1	West	8			
223	Railway Station	1	West	8	Low Lying/Waterlogging Prone Zone		
224	SayajiGanj Police Station	1	West	8	Low Lying/Waterlogging Prone Zone		
225	Ambedkar Circle		West	8	Waterlogging during High intensity of the rainfall		
226	Gotri_Samta_Kunal_4rasta	1	West	9			
227	Suresh_Bhajiya_House_Road Samta	1	West	9			
228	Sona Party Plot		West	9	Waterlogging during High intensity of the rainfall		
229	Darshnam Sentos, Sevasi		West	9	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
230	Shyamal Arcade, Bhayali		West	9	Waterlogging during High intensity of the rainfall	Water remained upto 27 July	
231	Ambika Nagar	1	West	10			
232	Amina Nagar	1	West	10			
233	Bright Day School Bhaili	1	West	10			
234	Darul Uloom Tandalja	1	West	10			
235	Kismat Char Rasta	1	West	10			
236	Panchmukhi_Toword_Amin an	1	West	10			
237	Time_Circle	1	West	10			
238	Sevasi Gam	1	West	10	Divyabhaskar News Paper 2024		
239	Radha_Krishana_circle	1	West	11			
240	Dashama_Chowkdi	1	West	11			
241	Mangalam Hospital To Gokul Party Plot	1	West	11	Divyabhaskar News Paper 2024		
242	New_Court	1	West	11			
243	Panchratan_Complex	1	West	11			
244	Old Ward No 10	1	West	11			
245	Basil School	2	West	11	Waterlogging during High intensity of the rainfall		

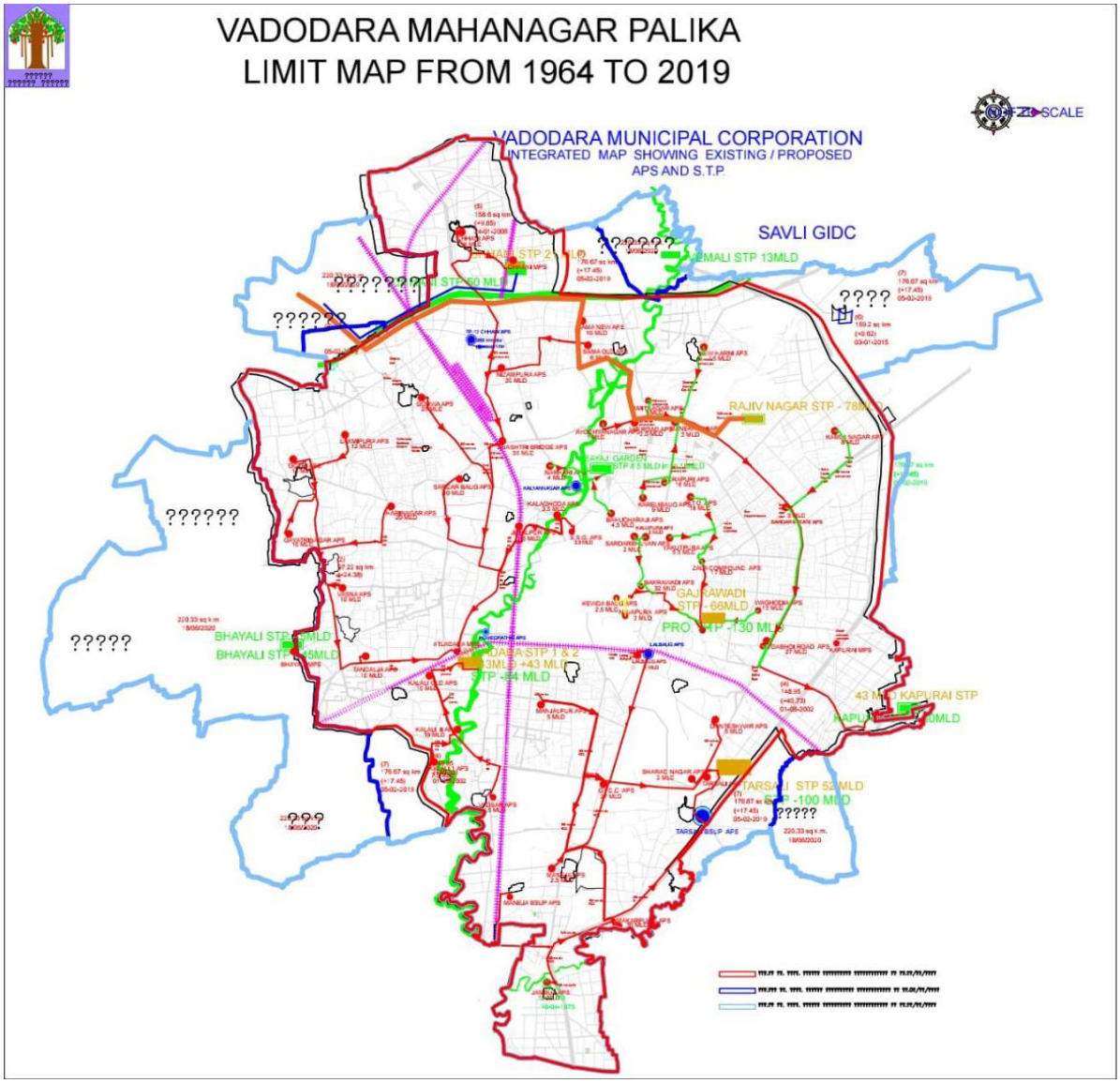


246	Rutu Ice-cream		West	11	Waterlogging during High intensity of the rainfall		
247	Samta Ground, Nr dashama Talav		West	11	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
248	Akota Cross Road	1	West	12	Low Lying/Waterlogging Prone Zone		
249	Ataladara Composer Plant	1	West	12	Low Lying/Waterlogging Prone Zone		
250	Ataladara NEW STP	1	West	12	Low Lying/Waterlogging Prone Zone		
251	Ataladara OLD STP	1	West	12	Low Lying/Waterlogging Prone Zone		
252	Manisha Cross Road	1	West	12			
253	Mujmahuda Tran Rasta	1	West	12	Low Lying/Waterlogging Prone Zone		
254	Nr Transpek Circle	1	West	12			
255	Opp. Samrajya Soc.	1	West	12	Low Lying/Waterlogging Prone Zone		
256	Padra Entry Baps Hospital	1	West	12			
257	R.C.Patel Farm	1	West	12	Low Lying/Waterlogging Prone Zone		
258	Under_Atladara_Flyover	1	West	12			
259	Near Vishwamitri Township (Nr 15 Soc)	1	West	12	Divyabhaskar News Paper 2024		
260	Parshuram bhaththo Sayajiganj	1	West	12	Divyabhaskar News Paper 2024		
261	Akshar Chowk		West	12	Waterlogging during High intensity of the rainfall		
262	Nandanvan Gas Station	1	West	12			
263	Akota Village	1	West	12	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
264	Kalali Village		West	12	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
265	Mujmahuda Area		West	12	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
266	Ranjitnagar, Parshuram Bhattha		West	12	Waterlogging during High intensity of the rainfall	Shifting of People carried out from the area	
267	Patrakar_Colony_Cross_Road	1	West	11			
268	Jamwadi Sayajiganj	1	West	12	Divyabhaskar News Paper 2024		
269	Kalali - Munjmahuda	1	West	12	Divyabhaskar News Paper 2024		
270	Bhairavnagar Vasahat	1			Divyabhaskar News Paper 2024		

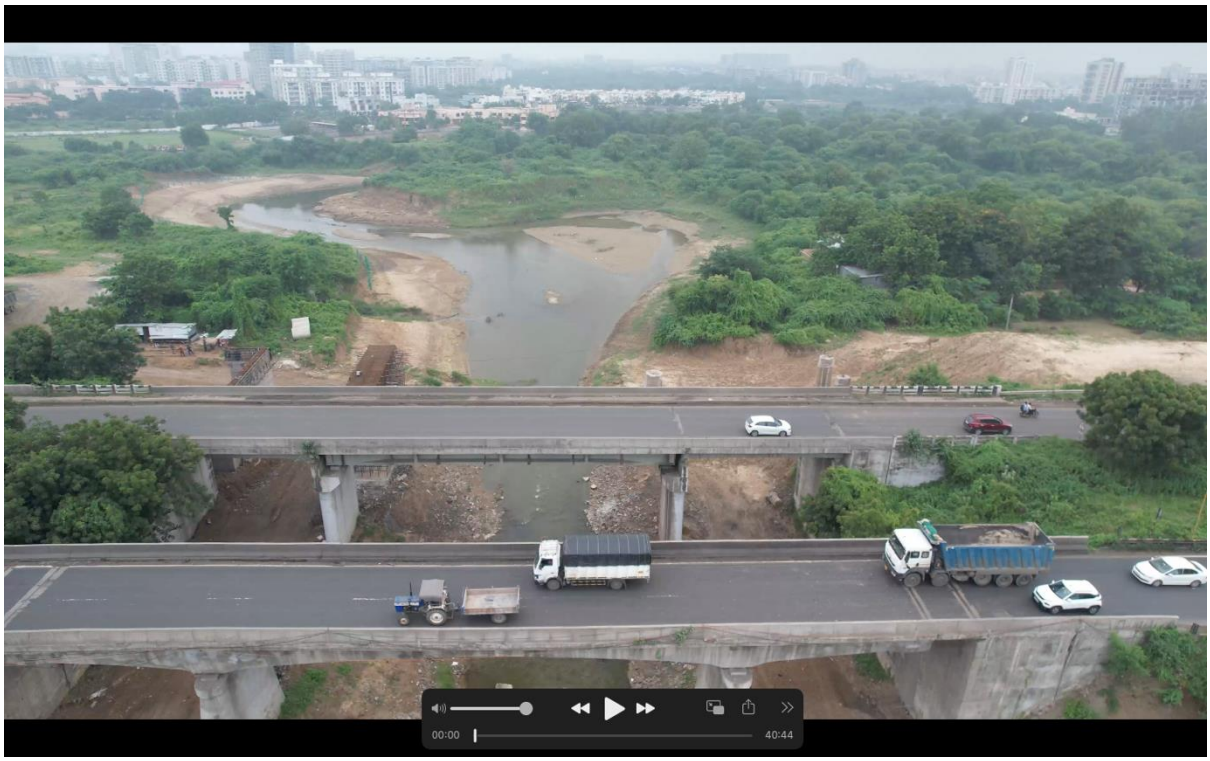
Note: પ્લાન ઓફ એકશનમાં સદર વિસ્તારમાં ભરાતા પાણીના સમયસર નિકાલ માટે કરવાની થતી કાર્યવાહી જેવીકે રેઇન વોટર હાર્વેસ્ટિંગ, નવી સ્ટોર્મ વોટર લાઈન નાખવી, પાણી ભરાય તો પંપ વેસાડી પાણીનો નિકાલ કરવો તે પૈકી કઈ કામગીરી કરવાની થાય તેની વિગત લખવાની રહે છે. ઉપર જણાવેલા વિસ્તાર સિવાય કોઈ વિસ્તારમાં પાણીનો ભરાવો થતો હોય તેવા આપની જાણકારી મુજબના વિસ્તારોનો પણ સમાવેશ કરી લેવા વિનંતિ છે.

Annexure XV: Existing, Ongoing & Proposed Auxiliary Pumping Station (APS) and Sewage Treatment Plant (STP)




VADODARA MAHANAGAR PALIKA
LIMIT MAP FROM 1964 TO 2019
VADODARA MUNICIPAL CORPORATION
INTEGRATED MAP SHOWING EXISTING / PROPOSED
APS AND S.T.P
SCALE
SAVLI GIDC
??????
??????
??????
??????
?????
????
RAJIV NAGAR STP - 78MLD
GAJRAWADI
STP - 66MLD
PRO. STP -130 MLD
43 MLD KAPURAI STP
TARSALI STP 52MLD
STP -100 MLD
?????
???

Annexure XVI: Drone Survey by VMC dated 18.08.2025 (Selected Views)

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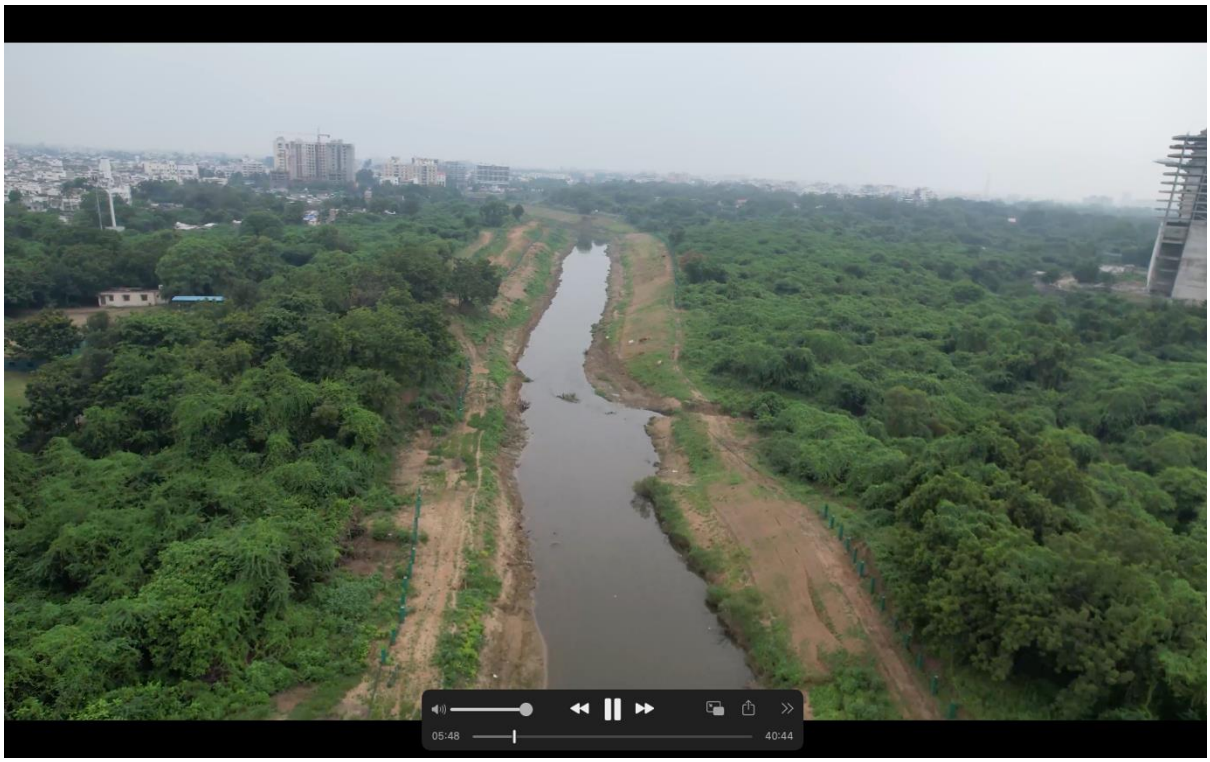
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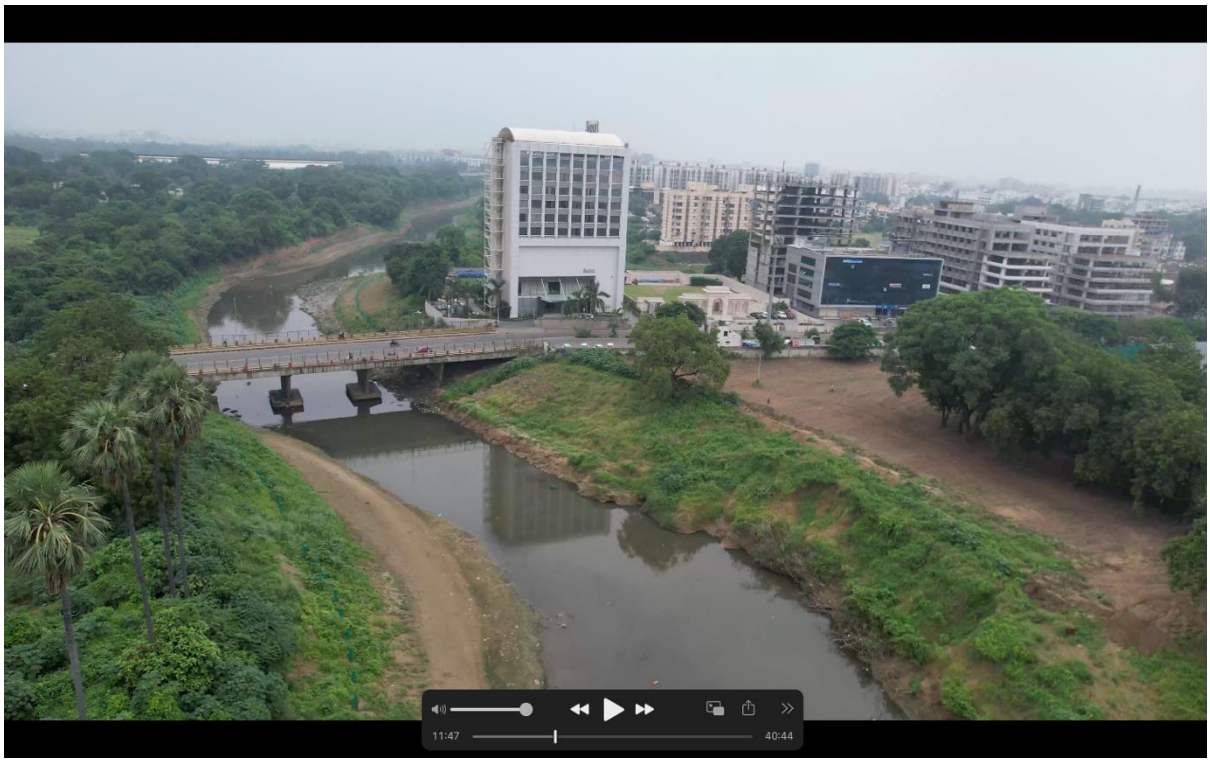
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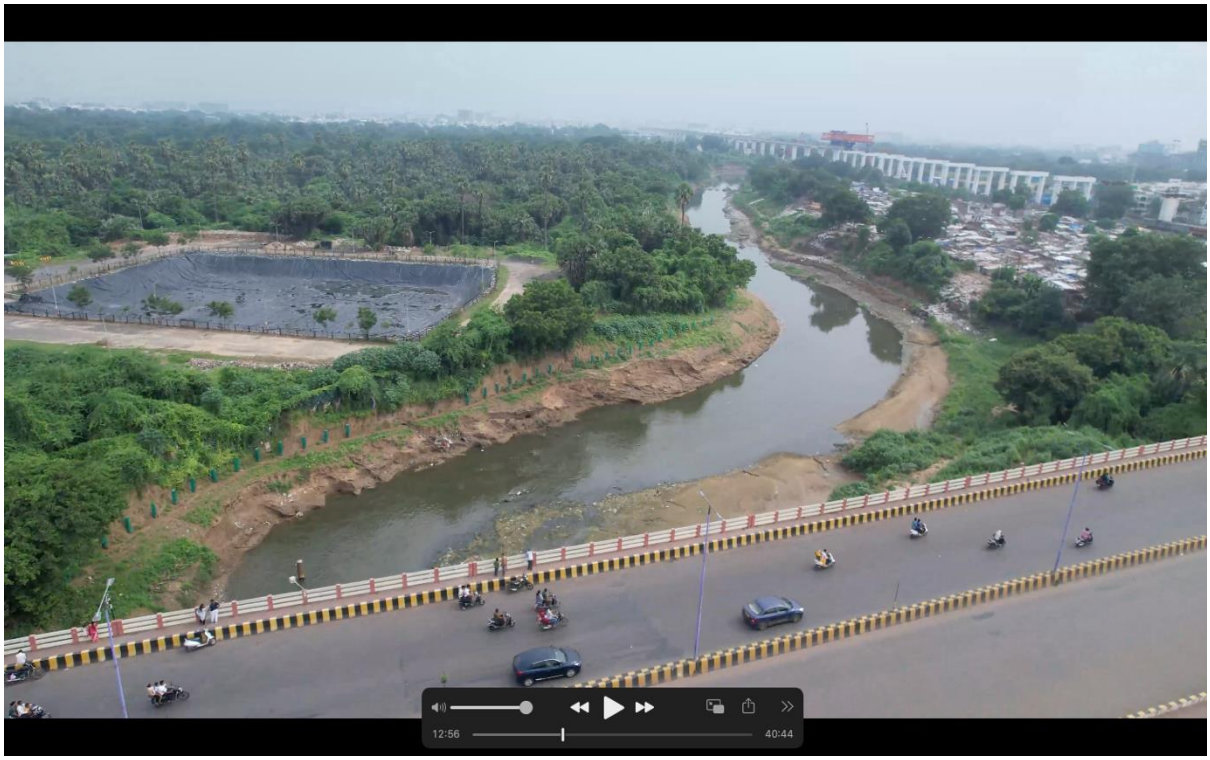
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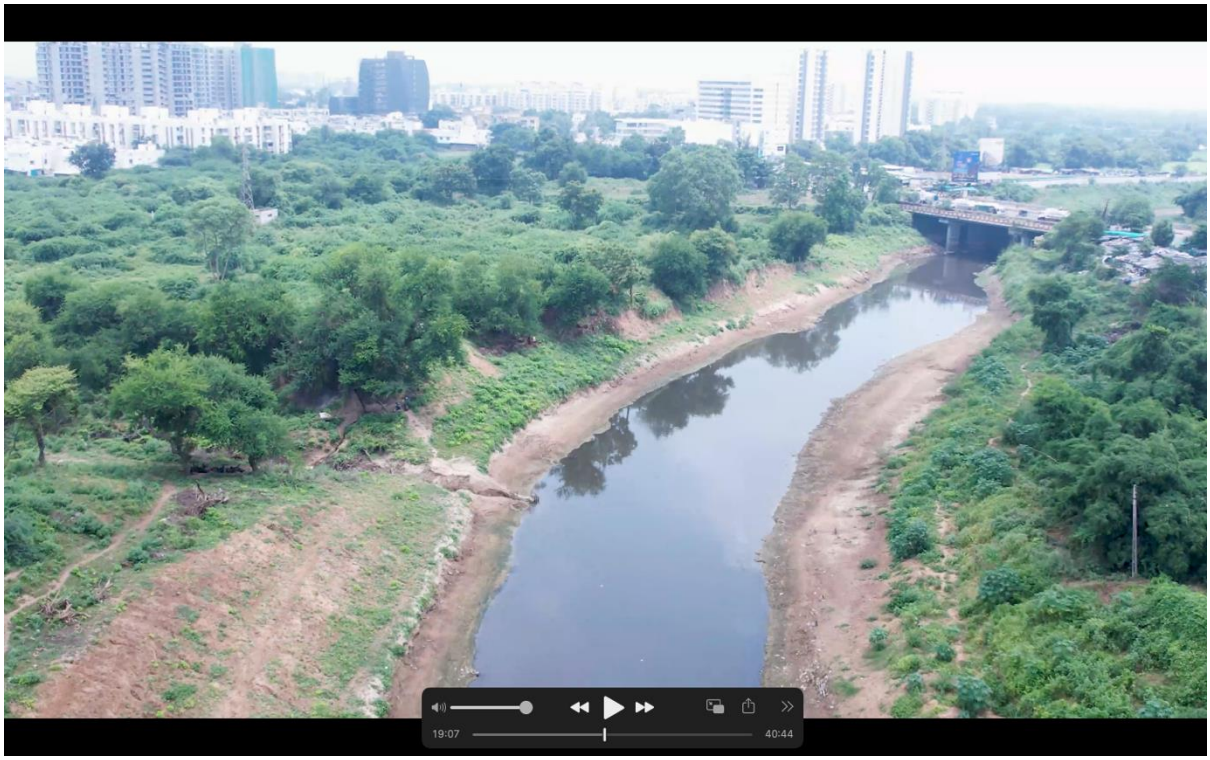
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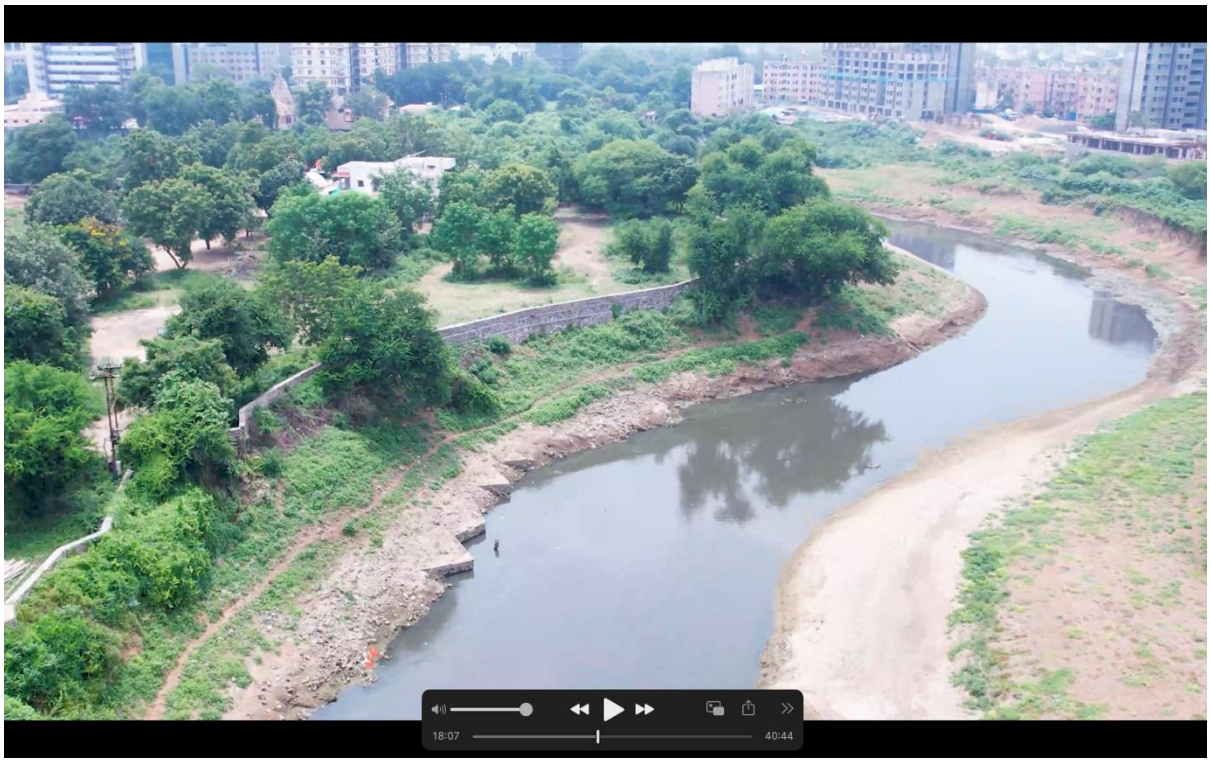
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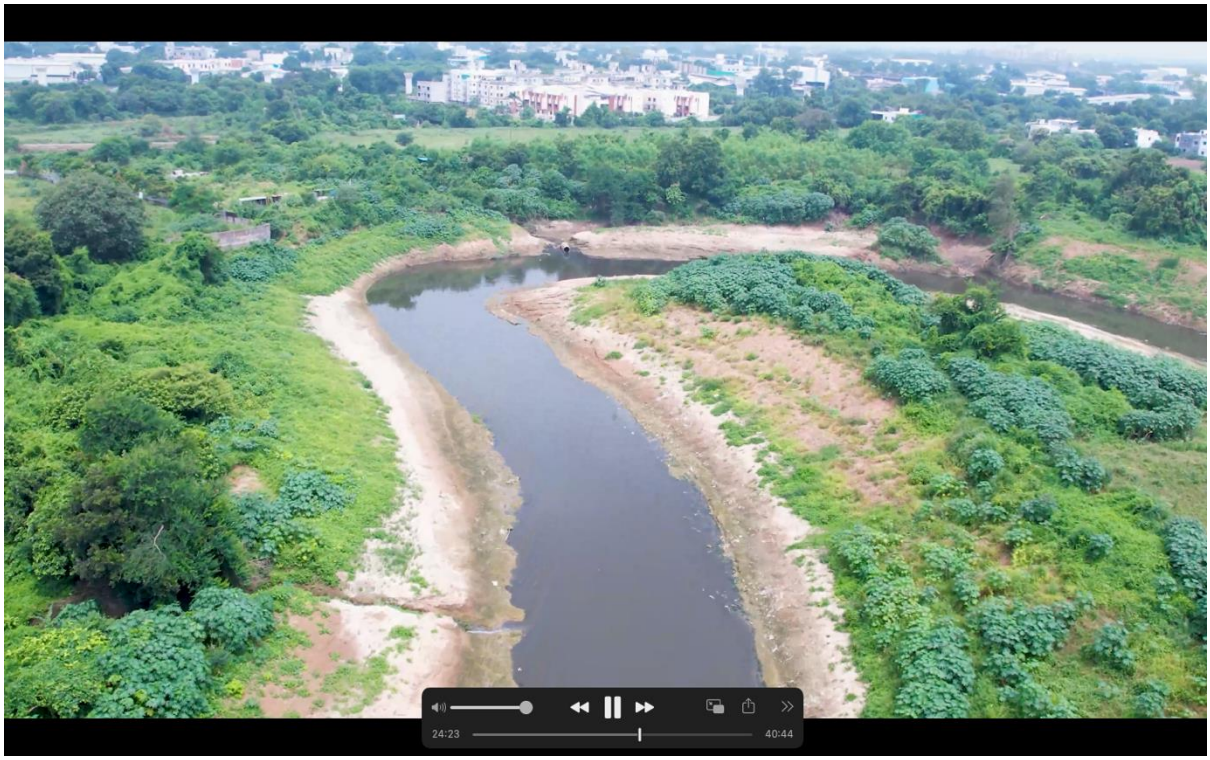
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