

**REVISED ACTION PLAN FOR REJUVENATION OF RIVER UMTREW
RI-BHOI DISTRICT, MEGHALAYA
IDENTIFIED AS RIVER POLLUTED STRETCH
UNDER PRIORITY -IV**

PREPARED BY

**RIVER REJUVENATION COMMITTEE
GOVERNMENT OF MEGHALAYA**

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1.0 INTRODUCTION

The **Umtrew River** is formed by the two streams, one originating from the Sohpetbneng Peak near Mawrong village and the second one is the outflow of the Umiam dam. The two streams converge near Nongkhylllem Wildlife sanctuary and then it flows across the Byrnihat town for a distance of 9.5 kms and ultimately joins the Brahmaputra River. Upstream of the sampling location is an industrial estate. The river also receives the pollution load from the residential and commercial area either directly or through drains and streams. Map below indicates the catchment area of Umtrew river

(a) **Localities in the catchment of umtrew River:** The localities in the catchment of Umtrew river are Nongkylla Mikir, Byrnihat, Amjok, Borbhoin, Nongkylla Khasi, Jojwa,

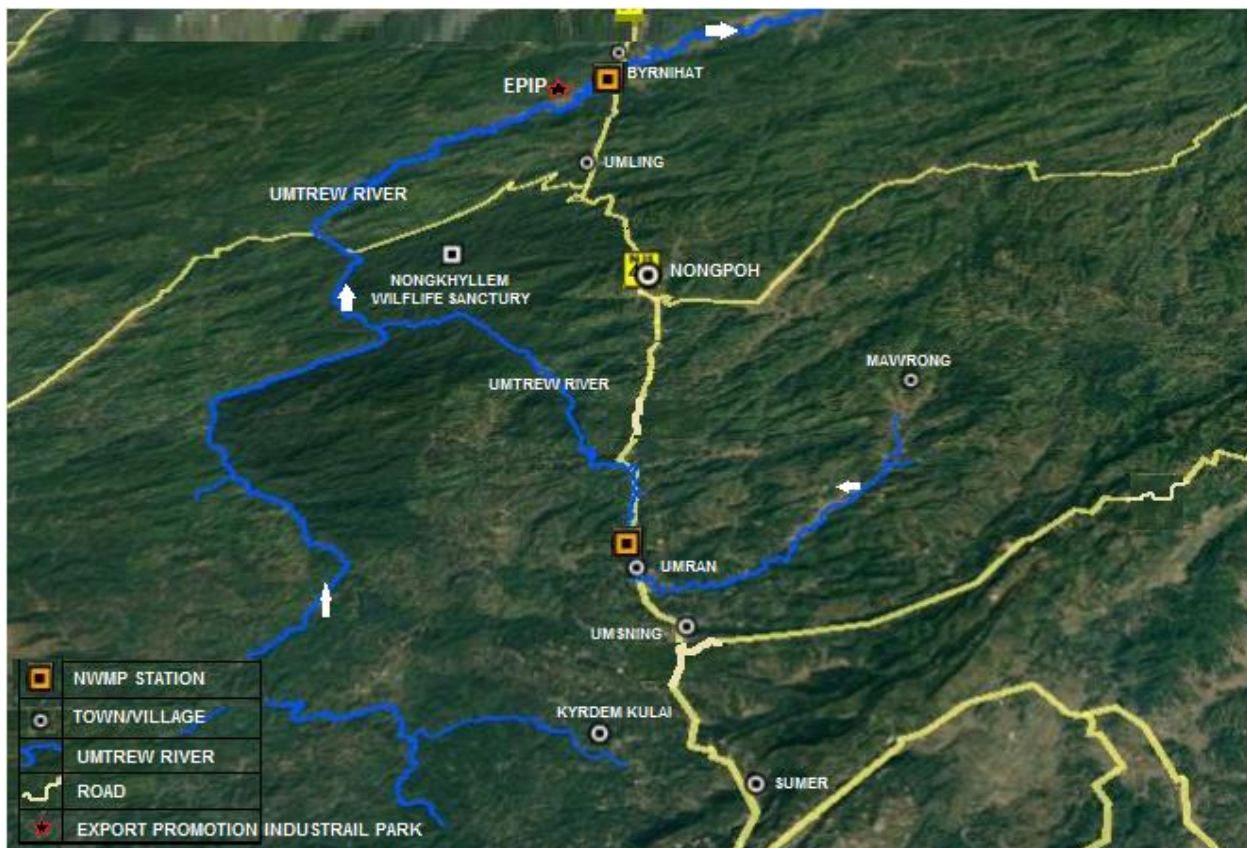


FIGURE 1: MAP INDICATING CATCHMENT AREA OF UMTREW RIVER

- (b) **Major Industrial Areas in the Catchment of River Umtrew:** There is one major industrial estate and some small industries in the catchment area of the Umtrew River.
- (c) **Major Drains contributing to Pollution in Umtrew:** There are 5 major drains/streams which pass through Byrnihat town that discharge the untreated sewage and municipal wastes into the Umtrew River. Table 1 below indicates the identified drains and their co-ordinates and flow

TABLE 1: MAJOR DRAINS CONTRIBUTING TO POLLUTION IN RIVER UMTREW

River	Drains	GPS Coordinates	Discharge of flow (Cumec)
Umtrew	Stream at Nongkylla Mikir, Byrnihat (coming from 18 miles,-NH)	N 26° 01.849' E 91° 51.692'	0.14
	Drain near Meghalaya Hume Pipe, Byrnihat (Amjok, Borbhuin, Nongkylla,)	N 26° 02.488' E 91° 51.964'	0.16
	Stream near Jai kamakhya alloy Pvt. Ltd, EPIP, Byrnihat, Upper Borbhuin	N 26° 02.262' E 91° 51.393'	0.10
	Stream at Jojwa ,EPIP, Byrnihat ,Jojwa	N 26° 01.278' E 91° 50.028'	0.09
	Byrnihat side-drain near petrol pump,way to EPIP- leading into Umtrew river (mid- stream).	N 25° 49'.26.1" E 91° 45'.28.2"	0.11

2.0 OBJECTIVES/ACHIEVABLE TARGETS FOR RESTORATION OF POLLUTED UMTREW RIVER

In pursuance of the Hon'ble National Green Tribunal (Principal Bench), New Delhi, orders dt. 20.09.2018 and 19.12.2018 in original application No. 673/2018 in the matter on News item published in "The Hindu" Titled more river stretches are now critically polluted - Central Pollution Control Board, an action plan has been evolved with the objective of restoration of Umtrew river to meet the bathing standards .

3.0 Water Quality of the River, drains and ground water sources (located in the catchment of the of the Umtrew River).

3.1 Water quality data of Umtrew River

The river water quality data for the year 2019 (Jan to Dec) is provided at Table 2 below (The regular monitoring is carried out by Pollution control Board)

Table 2 -WATER QUALITY DATA OF UMTREW RIVER AT BYRNIHAT 2019

PARAMETERS MONTHS	pH	DO mg/L	BOD mg/L	FC MPN/100ml	TC MPN/100ml
JAN	7.4	7.5	3.5	490	2400
FEB	7.3	5.4	6.5	580	2800
MARCH	7.3	6.2	5.0	630	3100
APRIL	7.0	5.0	6.0	700	3500
MAY	6.9	5.4	5.8	630	3300
JUNE	7.0	6.0	5.0	490	2400
JULY	7.0	6.4	4.2	210	1300
AUGUST	7.3	6.8	3.5	170	1100

SEPTEMBER	7.2	7.2	3.4	140	790
OCTOBER	7.3	7.0	3.6	130	700
NOVEMBER	7.4	7.1	3.4	120	630
DECEMBER	7.2	7.4	3.2	140	440

3.2 Water quality characteristic of waste water from the drains

Tables 3 below provided the water quality characteristic of the drains

Table 3: WATER QUALITY DATA OF DRAINS DISCHARGING INTO UMTREW RIVER AT BYRNIHAT

Sampling Locations→	Stream at Nongkylla Mikir, Byrnihat	Drain near Meghalaya Hume Pipe	Stream near Jai Kamakhya Alloy Pvt. Ltd, EPIP, Byrnihat	Stream at Jojwa, EPIP, Byrnihat	Byrnihat side-drain near petrol pump, way to EPIP- leading into Umtrew river (mid- stream)
Parameters ↓					
<i>pH</i>	7.8	7.5	7.4	7.7	7.5
<i>Dissolved Oxygen (mg/l)</i>	7.1	Nil	4.2	6.5	7.2
<i>BOD (mg/l)</i>	2.0	15.0	7.5	3.2	3.5
<i>Total Coliform (MPN/100ml)</i>	920	5400	3400	540	790
<i>Feacal Coliform (MPN/100ml)</i>	220	1700	1400	79	140
<i>Zn (mg/l)</i>	BDL	BDL	BDL	BDL	0.06
<i>Cr (mg/l)</i>	BDL	BDL	BDL	BDL	BDL
<i>Ni (mg/l)</i>	BDL	BDL	BDL	BDL	BDL
<i>Cu (mg/l)</i>	BDL	BDL	BDL	BDL	BDL
<i>Mn (mg/l)</i>	BDL	BDL	BDL	BDL	0.11

3.3 GROUND WATER QUALITY

The Meghalaya State Pollution Control Board is monitoring the water quality of ground water located in the industrial Estate and the water quality is provided at Table 4 below

Table 4: GROUND WATER QUALITY DATA IN THE CATCHMENT OF UMTREW RIVER

Sampling Locations→	<i>Drinking Water Norms as per IS 10500:2012</i>	Narbong Well
Parameters ↓		
<i>pH</i>	6.5-8.5	6.7
<i>Conductivity (mg/l)</i>	-	105.0
<i>Chloride (mg/l)</i>	250.0	7.0
<i>Alkalinity (mg/l)</i>	200.0	28.0
<i>Total Hardness (mg/l)</i>	200.0	30.0
<i>Nitrate-N (mg/l)</i>	45.0	0.38
<i>Iron (mg/l)</i>	0.3	0.34

Total Coliform (MPN/100ml)	Shall not be detectable	47
Faecal Coliform (MPN/100ml)	--	Not Detectable
Zn (mg/l)	5.0 mg/l	0.09
Cr (mg/l)	0.05	BDL
Ni (mg/l)	0.02	BDL
Cu (mg/l)	0.05	BDL
As (mg/l)	0.01	BDL
Lead (mg/l)	0.01	BDL
Cadmium (mg/l)	0.003	BDL
Manganese (mg/l)	0.1	BDL

The analysis result indicated that the water quality doesnot conform to the Drinking Water Norms as per IS 10500:2012 with respect to the Total Coliform.

4.0 IDENTIFICATION OF SOURCES OF POLLUTION:

Major sources of pollution in River Umtrew are:

- a. Sewage / municipal drainage from the localities
- b. Improper disposal of solid waste into the drains.
- c. Industrial effluents from the Industrial estate

5.0 COMPONENTS OF ACTION PLAN

Following components have identified for preparation of action plan for rejuvenation of river in compliance to the Hon'ble NGT Orders as detailed below:

The proposed action plan covers following components:

5.1 Channelization, treatment, utilization and disposal of treated domestic sewage

- a. Identification of villages in the catchment of river Umtrew and estimation of quantity of sewage generation.
- b. Identification of Site for setting up of STP to be carried out

5.2 Industrial Pollution Control

- a. Inventorization of industries
- b. Category of industry and effluent quality
- c. Treatment of effluents, compliance with standards and mode of disposal of effluents

5.3 Solid Waste Management

- a. Collection, segregation, transportation, disposal and treatment of municipal solid wastes generated from town in accordance of provisions of the Solid Waste Management Rules, 2016.
- b. Restriction of illegal disposal of solid waste along the river bank of Umtrew River and flood plain zones.
- c. Burning of solid waste should be strictly prohibited.
- d. Construction and demolition wastes should be disposed in designated areas and no case it

should be disposed into river beds or flood plain zone.

5.4 Flood Plain Zone

- a. Regulating activities in flood plain zone.
- b. Management of Municipal, Plastic, Hazardous, Bio-medical and Electronic wastes.
- c. Afforestation in the catchment and aesthetic plantation programs.
- d. Improve irrigation practices.

5.5 Ecological/Environmental Flow (E-Flow)

- a. Issues relating to E-Flow
- b. Irrigation practices

6.0 DETAILED GAP ANALYSIS

6.1 SEWAGE MANAGEMENT:

The sewage flow is considered as 80% of the net water supplied to the consumer. Considering 135 lpcd water supply, the rate of sewage generation works out as 108 lpcd and the same has been adopted. The population in the catchment of Umtrew river as per 2011 census is about 3311 and projected population is about 4404. The detailed gap analysis is given in the Table 5 below

TABLE 5: GAP ANALYSES WITH RESPECT TO SEWAGE

Rivers	Town	Population (2011)	Population (2032)	Projected Total Water Consumption (135 lpcd) (MLD)	Projected Estimated Average Sewage Generation(MLD)*	Existing STPs		Gap (MLD)
						Nos	Capacity	
Umtrew	Byrnihat	3311	4404	0.60	0.48	-	-	0.48

Base on the projected population, the estimated gap in sewage management is 0.48

6.2 INDUSTRIAL EFFLUENT MANAGEMENT

In the catchment of the Umtrew River there is one industrial estate. The total number of industries units which fall in the catchment of Umtrew River is 29 in number. The number of industries categorically located in and around the catchment area of the Umtrew river stretch are as follows in Table 5:

TABLE 6: NUMBER OF INDUSTRIES OPERATING IN THE CATCHMENT

Sl. No.	River	Identified River Stretch	Type of Industries/category	Number of Industries
1.	Umtrew	Byrnihat to Morangdala	Red Category	6
			Water polluting /small scale	23

The total water consumption of the industries, the total effluent generated and number of captive ETPs along with the Gap Analysis within the catchment of Umtrew River are given in the **Table 7**

TABLE 7: GAP ANALYSIS OF EFFLUENT GENERATED BY INDUSTRIES

Sl. No.	River	Type of Industries/ category	No. of Industries	No. of Industries having Captive ETPs	No. of Industries not having Captive ETPs	Total Water Consumption by the Industries (MLD)	Industrial Effluent Generated by the Industries (MLD)	Industrial Treated Effluent	GAP	Mode of Disposal
1.	Umtrew	Red Category	6	6	-	0.845	0.676	0.676	Nil	Treated Effluent is Disposed off to Drains
		Water polluting /small scale	23	23	-					

6.4 SOLID WASTE MANAGEMENT

Sl. No.	Town or City	Population (2011)	Expected population (in 2032)	Future Total solid waste generation (at 0.35 kg per head per day) in TPD	Existing treatment facility		GAP
					Total no. of Treatment facilities	Total capacity	
1	Byrnihat (Catchment of Umtrew river)	3311	4404	1.54	A vermicomposting unit for bio-degradable waste to be constructed	15MT	Nil

For Scientific disposal of waste a secured sanitary landfill site has been prepared and the Clay liners and HDPE Liners are ready for supply and installation.

6.4 INDUSTRIAL HAZARDOUS WASTE

Automobile Service Centers are already covered under consent mechanism under Water Act (Prevention and Control of Pollution) Act 1974. The Committee advised the Meghalaya State pollution Control Board to bring all these under the HW & OW (M&H) Rules, 2016 and regulate them through authorization process

6.5 BIOMEDICAL WASTE MANAGEMENT

There is no Health care centre in the catchment of Umtrew River

6.6 CONSTRUCTION & DEMOLITION WASTE

No major large scale construction or demolition is carried out within the catchment area of the two rivers. Small scale housing construction and demolition is carried out where in the waste is used for land filling and levelling

7.0 UMTREW RIVERS REJUVENATION PLAN:

7.1 Action plan for management of sewage:

- a. All the new households within the catchment area of the Umtrew River needs to have a septic tanks and a soak pit.
- b. The flow in each drain should exclude monsoon flow. Further, any drain if receiving fresh water from any escape channel etc, should be examined for its diversion rather than mixing with sewage.

7.2 Action plan for management of industrial effluents:

- a. All the industries (water polluting) will be directed to have captive ETPs and ensure to compliance to effluent discharge norms.
- b. All the water polluting industries will be directed to have online Continuous Effluent Monitoring System (OCEMS).
- c. Industries will be directed to adopt best practices to minimize water consumption and for recycling of treat waste water.
- d. Provision of waste water treatment system.
- e. Hotels/Restaurants particularly located on road-side should not dispose untreated sewage and solid waste into nearby public drain or rivers. Such establishments should be properly regulated and levied with fines in case of any violation.

7.3 Action plan for management of Solid Waste Management:

- a. Implementation of Door-to-Door collection.
- b. Source segregation as biodegradable and non-biodegradable wastes.
- c. Identification of suitable site for setting up common waste processing and secure landfill facility.
- d. Transportation, disposal and treatment facilities of municipal solid wastes generated from town in accordance of provisions of the Solid Waste Management Rules, 2016.
- e. Restriction illegal disposal of solid waste along the river bank and flood plain zones.
- f. Prohibition on burning of solid wastes.
- g. Development of integrated solid waste management facility (provision of segregation, treatment, compost, pellats making as well as landfill with leachate treatment provision in accordance with solid waste management rules, 2016 as further amendments made thereof.

7.4 Flood Plain Zone (FPZ)

Department of Water Resources should identify /demarcate Flood Plain Zone and regulate the activities. Such regulations would also cover:

- a. Plantation in Flood Plain Zone (FPZ) – By Forest and Environment Department, Meghalaya
- b. Checking and removal of encroachments periodically- District Administration

5 Greenery development- Plantation plan/Biodiversity Parks:

Greenery or plantation on both sides of the river will be carried out by the Forest Department to protect soil erosion and further encroachment into the river

7.6 Sand Mining in river stretches:

There has been no account of sand mining in the Umkrah rivers stretch.

7.7 Environmental Flow (E-Flow):

The river Umtrew carries the natural water during the monsoon and even during the lean season as the rivers is perennial. Provisions of roof top rain water harvesting in Govt. building, commercial buildings, hotels and Houses will be emphasized. By-laws are made in the Urban Affairs Department for provisions of roof top rain water harvesting. Hydrological Stations will be set up along the stretch of the river Umtrew by Water Resources Department.

8 MONITORING OF ACTION PLAN

In compliance with the order passed on OA No. 673/2018 dated 20.09.2018 by the Hon’ble National Green Tribunal (NGT) Principal Bench, New Delhi, “River Rejuvenation Committee” was constituted by the Governor of Meghalaya vide order NO. ENV.5/2018/44 Dated 24.01.2019. The proposed Action Plans will be monitored by the River Rejuvenation Committee (RRC) which has been constituted by Government of Meghalaya. CPCB experts also shall be invited for the RRC review meetings for taking feedback and suggestions.

Action Plan for River Rejuvenation of polluted river stretches shall be prepared and monitored by the Committee.

River Rejuvenation Committee:-

- | | |
|--|--------------------|
| 1. PCCF & HOFF, Forest & Environment Department, Meghalaya | -- Chairman |
| 2. Director, Urban Affairs Department, Meghalaya | -- Member Convener |
| 3. Director, Commerce and Industries Department, Meghalaya | -- Member |
| 4. Member Secretary, Meghalaya State Pollution Control Board | -- Member |

9. Action plans with time lines and executing authorities with the budget estimates are given in the following Table below

Sl. No	Action Plan for rejuvenation of River Umtrew	Execution Agency/ Department	Time Target	Amount (in rupees)	Remarks
1. SEWAGE MANAGEMENT					
	Bio-remediation of Drains	MSPCB	30th March 2021	DPR to be prepared	
	Construction of septic latrines with soak pits	PHED/Urban Affairs Deptt			Under swach Bharat Mission (G)
2. INDUSTRIAL POLLUTION CONTROL					
	Action against the industries not installed ETPs or ETPs exist but not operating or ETP outlet or treated effluent is not complying to the effluent discharge standards or norms.	MSPCB	Continuous Process		Directions, show cause notices and Closure notices are issued.
3. SOLID WASTE MANAGEMENT:					
	Solid Waste Management Project. 1. A Solid Waste Management Project is being initiated by the Urban Affairs Department for the development of the scientific waste management facilities for Umtrew Town 2. Development of integrated solid waste management facility (provision of segregation, treatment, compost, pellets making as well as sanitary landfill with leachate treatment provision in accordance with solid waste management rules, 2016 as further amendments made thereof.	Urban Affairs Department/ Shillong Municipal Board			Completed
4. E-WASTE AND PLASTIC WASTE ASSESSMENT:					
	1. Inventory (Assessment, quantification and characterization) of waste on E-Waste & Plastic waste	Meghalaya Pollution Control Board	30th June 2020	-	Meghalaya State Pollution Control Board has yet to complete inventory, assessment, quantification and characterization of E-Waste & Plastic waste in 2018.

2. Development of collection centres.					Karo Sambhav has set up a collection centre in Shillong
5. GROUNDWATER QUALITY					
Groundwater quality monitoring station in the catchment of river Umtrew	Meghalaya State Pollution	Continuous Activity	-		
6. FLOOD PLAIN ZONE:					
Prohibition on illegal disposal of waste and removal of encroachment from river banks.	District Administration & Urban Affairs Department	Continuous activity	-		
7. ENVIRONMENTAL FLOW (E-FLOW) AND GROUNDWATER RECHARGE MEASURES:					
Provisions of roof top rain water harvesting	District Administration/ Urban Affairs Department	Continuous activity	-		To be implemented in Govt. building, commercial buildings, hotels, Industries and Houses(Permanent Structure/Conventional method .
Setting up of Hydrological Stations. (non- recurring cost)	Water Resources Department	30 th March 2021	0.054 Crores		Funding through State Government
8. GREEN DEVELOPMENT:					
Plantation on both sides of the river and in the private land and individual land owner	Forest & Environment Department	30 th March 2021	0.0874548 crore		Funding through State Government
9. CLEANING & AWARENESS ACTIVITIES					
Public awareness programme through add on media	Forest & Environment Department, MSPCB, District Administration	Regular Activities			