खंड–4
(केवल कार्यालय उपयोग हेतु)

Volume-IV
(FOR OFFICIAL USE ONLY)

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
जल संसाधन नदी विकास और गंगा संरक्षण मंत्रालय
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION
केन्द्रीय जल आयोग
CENTRAL WATER COMMISSION

जलवर्ष पुस्तिका
WATER YEAR BOOK
(जून 2016 - मई 2017) (June 2016 – May 2017)
वंषधारा,ऋषिकुल्या,सारदा एंव नागावली बेसिन
VAMSADHARA, RUSHIKULYA, NAGAVALI & SARADA BASIN

जल विज्ञानीय प्रेक्षण परिमंडल
HYDROLOGICAL OBSERVATION CIRCLE
भुवनेश्वर (BHUBANESWAR)

September: 2017

खंड–4

Volume-IV

जलवर्ष पुस्तिका

WATER YEAR BOOK

(जून 2016 से मई 2017) (June 2016 - May 2017)

वंषधारा,रूषिकुल्या,सारदा एंव नागावली बेसिन

VAMSADHARA, RUSHIKULYA, NAGAVALI & SARADA BASIN

FOREWORD

Proper assessment, analysis and compilation of hydro-meteorological data are essential for planning and management of precious water resources, which is vital not only for economic development but also for providing basic needs for such a large population of our country. Water reaches the land-mass through precipitation, a part of which evaporates, a portion of it percolates into ground as natural ground water and the excess runoff flows through rivulets and rivers and drain into the sea. Central Water Commission (CWC), an apex technical Organisation of Government of India for surface water resources, carries out systematic collection of hydro-meteorological data and assessment of surface water as one of its prime functions.

Hydro-meteorological observation stations have been established by CWC in almost all the river basins of India in a phased manner. These are further modernised and strengthened under various schemes. In the process, additional Divisions, Circles and Regional offices have been set up on a basin-wise concept.

The basin encompassing the east flowing rivers in-between the Ganga and the Godavari basins viz. Subarnarekha, Burhabalang, Baitarani, Brahmani, Mahanadi, Rushikulya, Vamsadhara, Nagavali and Sarada has been identified as Mahanadi and Eastern Rivers Basin which is dealt by Mahanadi and Eastern Rivers Organisation (MERO), CWC, Bhubaneswar. Hydrological Observation Circle (HOC), Bhubaneswar under MERO carries out hydrological observation and flood forecasting activities in these 9 river basins flowing mainly through Odisha along with its neighbouring States of Jharkhand, Chattisgarh, Andhra Pradesh and West Bengal through two Divisions under its jurisdiction viz. Mahanadi Division (MD), Burla and Eastern Rivers Division (ERD), Bhubaneswar.

There are a total of 119 observation stations under MERO. Systematic gauge and discharge observations are regularly conducted at 42 hydrological stations (out of the above 119) throughout the year. Sediment, Water Quality and Meteorological data are also observed at some of the stations. After scrutiny and checking, the collected & processed data are stored in a database through a custom made software “Surface Water Data Entry System (SWDES) and published in the form of Water Year Books. The present publication of Water Year Book contains Hydrological, Sediment and Water Quality data for the hydrological year 2016-17, i.e. from June 2016 to May 2017.

Water Year Book pertaining to the Hydrological Observation Circle, CWC, Bhubaneswar is published in four volumes. While Volume-I incorporates data of Mahanadi basin, Volume-II contains data of Brahmani basin, Volume-III of Subarnarekha, Burhabalang & Baitarani basins and Volume-IV of Rushikulya, Vamsadhara, Nagavali and Sarada basins. Each Volume contains Discharge data as Section-I, Sediment data as Section-II and Water Quality data as Section-III for respective river basins.

This Volume-IV covers hydrological, sediment and water quality data for Water Year 2016-17 of five sites of Rushikulya, Vamsadhara, Nagavali and Sarada river basins alongwith salient features and other important statistical information. Sincere effort put in by the officers and staff of ERD, CWC, Bhubaneswar namely, Smt.Dr. Shanthala Devi B.S, Extra Assistant Director and S.S. Mohanty, Senior Computer of Hydromet Section under the able leadership of Shri C. Mohanty, Executive Engineer, in collecting & processing the data and bringing out this publication is highly commendable. The guidance and encouragement of Shri A.K.Nayak, Chief Engineer, MERO, Bhubaneswar and co-operation of the officials of H.O. Circle and Chief Engineer’s office are duly acknowledged.

Place: Bhubaneswar
Date: September,2017

(D.K. Jena)
Superintending Engineer
HOC, CWC
Bhubaneswar

LIST OF ABBREVIATIONS USED:

General:

CWC	:	Central Water Commission
H.P.	:	Hydrology Project
IMD	:	India Meteorological Department
msl	:	mean sea level
Q	:	Discharge
WL	:	Water level

Type of station:

G	:	Gauge (Water Level)
D	:	Discharge (Average discharge passing across a cross section of the river
S	:	Sediment (suspended sediment load)
Q	:	Water Quality

Units:

m	:	meter
mm	:	milli meter
km	:	kilometer
s	:	second
MCM	:	million cubic meters
MT	:	metric tonne
g	:	gramme
l	:	litre

CONTENTS

(VOLUME-IV)

VAMSADHARA, RUSHIKULYA, NAGAVALI & SARADA BASINS

VAMSHADHARA BASIN

VAMSADHARA BASIN

1. GENERAL

1.1 Introduction

Vamsadhara river is an important east flowing river between Mahanadi and Godavari. The river originates near Lanjigarh village in Kalahandi district (Odisha) and runs for a total distance of about 254 km before it joins the Bay of Bengal at Kalingapatnam (Andhra Pradesh). The basin is narrow and undulated. It is situated within the geographical co-ordinates of 18°15′ to 19°55′ north latitudes and 83°20′ to 84°20′ east longitudes. The total catchment area of this basin works out to 10830 sq. km. The state-wise break-up is as follows:-

Sl. No.	Name of State	Catchment Area (sq. km)	Percentage of total catchment area
1.	Odisha	8,015	74
2.	Andhra Pradesh	2,815	26
	Total	**10,830**	**100**

Basin Map of Vamsadhara river system showing the various hydrological and hydro meteorological observation stations maintained by CWC, State Government and India Meteorological Department is enclosed herewith. Central Water Commission is maintaining 7 sites, out of which 1 is of GDSQ type, 1 of G&D type, and balance 5 of G type.

1.2 River system.

The Vamsadhara River is joined by six principal tributaries. Details for the same are tabulated below.

Name of River	River/Tributary	Length (km)	Catchment area (sq.km)	Percentage of total catchment area
Vamsadhara	Main Stream	254	5,458	50.4
Chauldua	Left Tributary	60	768	7.1
Phalphalia	Left Tributary	50	524	4.8
Ganguda(Harbhangi)	Left Tributary	85	1,689	15.6
Sanna Nadhi	Left Tributary	100	1,276	11.8
Mahendrathanaya	Left Tributary	70	1,115	10.3
	Total		**10,830**	**100.0**

1.3 Climatic Characteristics.

The climate in the basin is characterized by hot summers and mild winters. The basin is influenced by the south-west monsoon during June to November and occasional cyclones due to formation of depressions in the Bay of Bengal. The average annual rainfall is around 1400 mm. The maximum temperature in the plains of the basin rises up to 43 ^{0}C during May and goes down to 12 ^{0}C in December-January. The humidity during monsoon is as high as 95% to 96%. Due to topographical and other characters of the basin, the run-off time is limited, thus creating flash floods.

1.4 Geology

The basin surface is mostly covered with Kankar and Murum. The important minerals found in the Vamsadhara basin are Manganese, Graphite, Quartz, Lime Stone, Mica and Bauxite besides building materials. Manganese Ore is available extensively in Srikakulam (Andhra Pradesh) and Koraput (Odisha).

1.5 Site Details

Sl. No.	Name of Project	River	Status
1	Harbhangi	Harbhangi	Existing
2	Badanalla	Badanalla	Existing
3	Gotta Barrage	Vamsadhara	Existing
4	Chelligarha	Badajore	Under Construction

2. STREAM FLOW DATA

2.1 Methodology

Area-velocity method is generally adopted for measuring discharge at sites. Cup type current meter is used to measure the velocity of the flow and the depth is measured by using sounding rod for depths upto 3 m and by log line beyond 3 m. Discharge by area velocity method is being observed once in a day starting at 0800 Hrs. at all the sites except on Sundays and holidays. Besides, silt and water quality observation are also being carried out at CWC sites as list above.

The observed stage and discharge figures for each season (monsoon and non-monsoon) are plotted and a mean Stage V/s. Discharge curve is drawn, giving due attention to the scattered points with reference to area, velocity etc.

The factors responsible for the shifting of the curves are also taken care of by studying the river cross section at regular intervals and with super imposition of previous years' Stage V/s. Discharge curves. Accordingly, the trend of the current curve is finalised. Finally, the discharges of the non observed days are computed from these Stage V/s. Discharge Curves.

2.2Data Availability

Details of data availability for Vamsadhara Basin is tabulated below:

Sl. No.	Code No.	Station Name	Type	Data available From	To
1.	AV000K9	Gunupur	G&D	G -19.04.78 D -01.06.01	Continuing -do-
2.	AV000J4	Kashinagar	GDSQ	G -20.03.71 D -28.04.71 S - 13.10.72 Q -01.09.72	Continuing -do- -do- -do-
3.	KUTRAGADA	Kutragada	G	G -08.06.87	Continuing
4.	GUDARI	Gudari	G	G -02.07.78	Continuing
5.	MAHENDRAGARH	Mahendragarh	G	G -01.06.87	Continuing
6.	MOHANA	Mohana	G	G -26.05.87	Continuing
7.	GOTTA BARRAGE	Gottabarrage	G	G -01.06.77	Continuing

2.3 Explanatory Notes on Water Year Book

SWDES (Surface Water Data Entry Software), a custom made software for processing hydrological data, has been used for preparation of this volume. The explanatory notes described below can be used for interpretation of data presented in this volume.

i) Water Year ranges from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

ii) Discharge is given in cubic meters per second.

iii) Discharges are expressed as 0.000 when river bed is dry and 0.000 N.F. when velocity is observed as 'NIL'.

iv) The zero R.L. of gauge is a datum level fixed for given site, which is kept 1 or 2 m lower than the lowest water level recorded in a perennial stream. In a non-perennial stream, it is kept 1 or 2 m lower than the lowest bed level of the stream.

v) Discharges are rounded off as per standard practice.

vi) Runoff in mm is the notional depth of water in millimeters over the catchment, equivalent to annual runoff volume calculated at the discharge measurement station. It is computed using the relation:

$$\text{Runoff (mm)} = \frac{\text{Annual runoff } (Mm^3) \times 1000}{\text{Catchment area } (km^2)}$$

vii) Peak and lowest flow correspond to the highest and lowest water levels recorded from 'SWDES' entered data.

viii) Measuring Authority refers to the field division of Central Water Commission (Eastern Rivers Division) responsible for the operation of the gauging station.

ix) The gauging station code number is a unique seven column alphanumeric reference number which facilitates storage and retrieval of flow data in data base. The first column is identifier of either an integral river basin or, for the sake of convenience, a region having several contiguous river catchments. This is followed by a column which identifies an independent river system which either has one or more outlets to the sea or crosses international border to enter another country. The third, fourth and fifth column spaces denote first, second and third order tributaries, respectively, from the mouth upstream. The sixth and seventh column spaces indicate the location of the gauging station in one of the 225 slots earmarked on the river. The blank column spaces are filled by zero.

3. HYDROLOGICAL DATA

This volume contains the following information for each site stated above:

i. History Sheet: Site Name, State, District, River Basin, Tributary, Sub-Tributary, Catchment Area, Latitude / Longitude, Opening / Closing date for various types of data.

ii. Annual maximum/minimum discharge since period of observation.

iii. Daily Water level and observed/ computed discharge data including 10-daily, monthly and annual totals etc.

iv. Histogram and Hydrograph showing current year monthly mean discharges, Historical monthly mean discharges, historical monthly minimum and monthly maximum discharges.
v. Histogram showing Annual Run off volume since beginning of observation.
vi. Pie-Chart showing monthly mean run off (as percentage of Annual Run off) historical for the current year.
vii. Plot of Pre and Post Monsoon Cross-section of the rivers for current year.
viii. Water Level hydrograph for 3(three) major flood events of current year.

4. SEDIMENT DATA (In case of Sediment Observation sites)

The frequency of sediment observation is carried out daily during monsoon season and once in a week (on Monday) during the non-monsoon period. Data for non-observed days is estimated/ interpolated from the relationship of discharge v/s. sediment load, prepared on the basis of observed sediment concentration and weighted mean discharge of the same year.

Sediment samples are collected from 0.6 depth, using Punjab type bottle sampler, from all the verticals along the hydrological observation sections where velocity is observed for computation of discharge. The collected samples from all the segments are combined in 3 to 7 groups having compartments or groups of equal or nearly equal discharges for analysis. Quantum of suspended sediment load is estimated in three grades, viz. Coarse, Medium and Fine. Coarse and medium grades are separated by sieving process and the fine grade by filtration of left over samples after sieving through filter paper. Grade wise concentration is derived gravimetrically as per standard procedure. The following parameters are derived and recorded:

- Daily Observed suspended sediment (g/l).
- Corresponding discharge.
- Average sediment load in tonnes/day (10 daily & monthly basis).
- Annual sediment load for the current year.
- Annual & Seasonal sediment load and the corresponding volume of inflow for all the years since inception.
- Grain size distribution of bed load.

5. WATER QUALITY DATA (In case of Water Quality Observation sites)

The water samples are collected at a regular interval of once in a month for trend stations and once in two month for base station (on 1st working day, from the main flowing segment of the stream just below the water surface (20 to 30 cm) on the Station Gauge line where depth of flow and velocity are maximum, preferably in the mid stream. The water samples are collected in the pre-rinsed and cleaned one-litre capacity polythene bottle having double stopper (inside and outside) facility. Sampling bottle is filled to its full capacity without entrapping air bubbles inside.

After sampling, the collected samples are sent to the Water Quality Laboratory (Level-II) based at Bhubaneswar (under the Eastern Rivers Division) and to Raipur laboratory (under Mahanadi Division, Burla), along with in-situ physical characteristics, for analysis. The samples received from the sites are preserved in a refrigerator in the water quality laboratories for analysis**.**

Analysis of parameters, namely pH, Electrical conductivity, Sodium, Potassium, Iron, Aluminum, Ammonia, Fluoride, Nitrate, Nitrite, Phosphate, Silicate, Boron, Sulphate, Calcium, Magnesium, Carbonate, Bi-carbonate, Chloride, Dissolved Oxygen, BOD and COD,

are carried out at the Level II laboratory by using standard methodology. Micro biological parameters like total colliform and faecal colliform are also being analyzed. For analysis of trace and toxic elements, samples are sent to Level-II+ laboratory at Hyderabad once in a year, in the month of April.

The following parameters are analyzed and recorded:

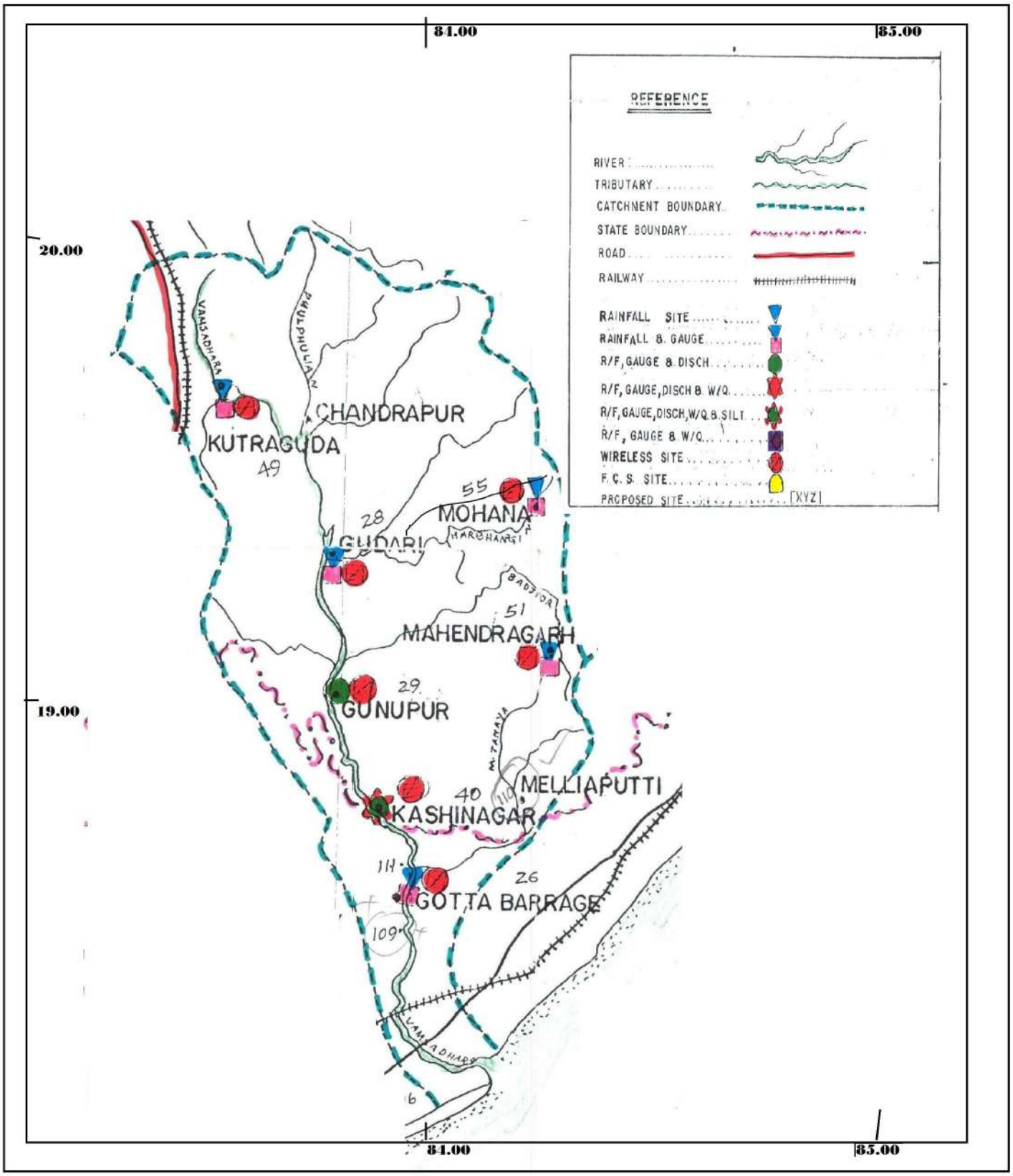
- Monthly Values: Physical; Chemical (mg/l); Biological (mg/l); Traces & Toxic (mg/l) and Chemical Indices.

- Average Values for the Year: 10 Years data to be given season wise averages:-

  - Average for Summer (March to June).
  - Average for Floods (July to October).
  - Average for Winter (November to February)

NAME OF THE SITES IN OPERATION UNDER VAMSADHARA BASIN

Sl. No.	Station Name	River/ Tributary	Code No.	Type	Latitude	Longitude
1.	Gottabarrage	Vamsadhara		G	18° 42' 00"	83° 57' 00"
2.	Gudari	Vamsadhara		G	19° 23' 00"	83° 48' 00"
3.	Gunupur	Vamsadhara	AV000K9	GD	19° 05' 00"	83° 49' 00"
4.	Kashinagar	Vamsadhara	AV000J4	GDSQ	18° 50' 49"	83° 57' 04"
5.	Kutragada	Vamsadhara		G	19° 36' 48"	83° 33' 33"
6.	Mahendragarh	Badajore		G	19° 13' 19"	84° 15' 55"
7.	Mohana	Harbhangi		G	19° 26' 40"	84° 16' 21"


84.00
85.00
20.00
19.00
REFERENCE
RIVER
TRIBUTARY
CATCHMENT BOUNDARY
STATE BOUNDARY
ROAD
RAILWAY
RAINFALL SITE
RAINFALL & GAUGE
R/F, GAUGE & DISCH
R/F, GAUGE, DISCH & W/Q
R/F, GAUGE, DISCH, W/Q & SILT
R/F, GAUGE & W/Q
WIRELESS SITE
F.C.S. SITE
PROPOSED SITE [XYZ]
VANSADHARA
PHULJHUR
CHANDRAPUR
KUTRAGUDA
49
55
MOHANA
28
MARCHANGI
GUDARI
BADJOR
51
MAHENDRAGARH
29
GUNUPUR
M. TAMAYA
40
MELLIAPUTTI
KASHINAGAR
111
26
GOTTA BARRAGE
109
VAMSADHARA
16
84.00
85.00

HISTORY SHEET

Water Year : 2016-2017

Site	**:**	**GUNUPUR**	**Code**	**:**	**AV000K9**
State	:	Orissa	District		Rayagada
Basin	:	EFR B Mahanadi-Godavari	Independent River	:	Vamsadhara
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Vamsadhara
Division	:	E.E., Bhubaneswar	Sub-Division	:	Behrampur
Drainage Area	:	6740 Sq. Km.	Bank	:	Left
Latitude	:	19°05'00"	Longitude	:	83°49'00"
Zero of Gauge (m)	:	80.25 (m.s.l)	1/1/1970	-	1/1/2158
		Opening Date	Closing Date		
Gauge	:	4/19/1978			
Discharge	:	6/1/2001			
Sediment	:	11/15/2013			
Water Quality	:	12/30/2013			

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1990-1991	4.824	83.600	8/22/1990	0.926	80.080	7/9/1990
1991-1992	5286	85.750	7/29/1991	10.50	80.550	7/5/1991
1992-1993	4499	85.100	7/27/1992	11.20	80.475	6/15/1992
1993-1994	376.2	82.110	7/16/1993	10.70	80.730	7/2/1993
1994-1995	3094	84.380	9/4/1994	7.300	80.830	6/25/1994
1995-1996	1835	83.000	8/31/1995	24.95	80.460	6/19/1995
1996-1997	968.5	82.950	8/23/1996	23.14	80.800	6/25/1996
1997-1998	2201	84.180	8/21/1997	4.652	80.770	7/17/1997
1998-1999	332.1	82.240	7/2/1998	9.207	80.750	6/27/1998
1999-2000	342.7	82.300	7/29/1999	11.40	81.110	6/28/1999
2000-2001	388.3	82.470	7/18/2000	1.358	80.910	5/3/2001
2001-2002	2211	83.790	7/7/2001	1.106	80.680	5/15/2002
2002-2003	450.2	82.640	8/29/2002	1.162	80.690	3/13/2003
2003-2004	3924	84.910	10/7/2003	0.000	80.530	6/7/2003
2004-2005	771.5	82.995	10/6/2004	1.200	80.550	5/22/2005
2005-2006	1893	83.785	9/19/2005	2.361	80.570	6/7/2005
2006-2007	5243	85.025	7/3/2006	5.070	80.090	4/7/2007
2007-2008	2987	85.950	8/7/2007	3.836	79.940	5/23/2008
2008-2009	3617	84.730	9/17/2008	1.543	79.380	5/2/2009
2009-2010	2049	84.000	7/19/2009	1.682	79.800	4/28/2010
2010-2011	1000	82.560	7/25/2010	1.775	79.800	6/8/2010
2011-2012	899.4	82.470	9/2/2011	1.222	80.070	5/31/2012
2012-2013	1121	82.795	8/3/2012	0.640	80.030	6/8/2012
2013-2014	1211	83.060	10/28/2013	4.011	80.070	4/30/2014
2014-2015	2855	84.125	9/7/2014	4.405	80.230	3/29/2015
2015-2016	670.0	82.500	9/16/2015	0.714	80.090	5/2/2016
2016-2017	393.3	82.050	8/6/2016	1.085	80.070	5/24/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	80.120	1.375	80.600	11.84	80.610	28.27	80.520	33.76	81.310	154.0	80.500	29.94
2	80.110	1.400	80.670	37.19	80.910	66.07	80.540	36.44	81.470		80.480	29.14
3	80.310	8.087	80.210	122.7 *	80.690	37.83	80.530	35.12	81.220	136.8	80.480	
4	80.240	6.392	80.640	32.43	80.650		80.950		81.480	178.6	80.470	29.09
5	80.200	5.000 *	80.480	18.24	81.345	149.2	81.190	135.5	81.170	120.8	80.470	28.94
6	80.170	3.124	80.425	14.27	82.050	393.3	81.210	128.4	81.120	117.0	80.470	28.50 *
7	80.400	14.18	80.340	10.45 *	81.430	178.0 *	80.950	81.13	81.190	120.9	80.470	28.50
8	80.250	4.524	80.300	8.642	81.440	181.9	80.820	70.33	81.620	231.5	80.470	28.53
9	80.220	4.669	80.465	15.59	81.190	132.5	80.720	51.21	82.230		80.460	27.81
10	80.430	14.08	80.470	16.52 *	80.950	78.12	80.680	46.54	81.770		80.460	27.92
11	80.350	9.134	80.900	65.97	80.820	71.75	81.050		81.790		80.450	27.11
12	80.270	6.000 *	80.800	61.57	81.375	184.8	81.070	102.0	81.440		80.440	26.34
13	80.220	3.940	80.665	37.27	81.035	96.90	80.900		81.240	130.1	80.420	24.45 *
14	80.190	2.880	80.515	19.45	80.790	66.54 *	81.070	107.7	81.110	115.8	80.420	23.50 *
15	80.160	2.328	80.455	15.13	80.650	49.44 *	81.185	125.9	81.020	101.0	80.390	22.02
16	80.150	1.926	80.425	14.45	80.600	43.33	81.250	139.0	80.940		80.380	21.21
17	80.250	6.190	80.400	12.41 *	80.580	38.73	80.970	84.26	80.850	83.24	80.370	19.80
18	80.440	15.99	80.390	11.60	80.585	40.77	80.880		80.800	76.42	80.370	19.88
19	80.380	12.53 *	80.530	20.86	80.555	37.66	81.320	153.0	80.740	68.34	80.370	20.10
20	80.260	5.625	80.500	19.84	80.500	29.34	81.190	121.0	80.700	59.32	80.370	20.00 *
21	80.200	3.491	80.470	17.97	80.440	24.02 *	81.030	106.7	80.660	52.85	80.360	19.50
22	80.180	2.875	81.050	91.61	80.370	17.80	80.920	85.75	80.630	43.52	80.360	18.82
23	80.160	2.711	80.770	56.35	80.480	22.71	81.080	110.6	80.600		80.350	18.77
24	80.170	2.917	80.660	46.95 *	80.735	58.80	81.360	163.0	80.580	40.65	80.350	18.70
25	80.310	8.882	80.840	62.57	80.730	62.02	81.260		80.560	38.16	80.340	17.60
26	80.350	11.12 *	80.600	28.58	80.620	44.21	81.150	119.4	80.550	37.02	80.340	17.39
27	80.480	17.46	80.670	33.87	80.860	73.94	81.230	137.6	80.530	35.16	80.330	16.50 *
28	80.595	31.19	80.565	26.09	80.880	77.58 *	81.130		80.510	31.89	80.320	15.58
29	80.520	19.84	80.575	25.13	80.730	50.84	81.030	108.0	80.510	31.46	80.320	15.63
30	80.390	12.16	80.500	20.76	80.600	42.51	81.215	131.0	80.510		80.310	14.07
31			80.590	27.19 *	80.590	41.29			80.510	31.35		
Ten-Daily Mean												
I Ten-Daily	80.245	6.283	80.460	28.79	81.127	138.4	80.811	68.72	81.458	151.4	80.473	28.71
II Ten-Daily	80.267	6.654	80.558	27.86	80.749	65.93	81.089	119.0	81.063	90.61	80.398	22.44
III Ten-Daily	80.336	11.26	80.663	39.73	80.640	46.88	81.141	120.3	80.559	38.01	80.338	17.26
Monthly												
Min.	80.110	1.375	80.210	8.642	80.370	17.80	80.520	33.76	80.510	31.35	80.310	14.07
Max.	80.595	31.19	81.050	122.7	82.050	393.3	81.360	163.0	82.230	231.5	80.500	29.94
Mean	80.283	8.067	80.564	32.37	80.832	80.67	81.013	100.6	81.012	88.52	80.403	22.6

Annual Runoff in MCM = 834 Annual Runoff in mm = 124

Peak Observed Discharge = 393.3 cumecs on 06/08/2016 Corres. Water Level :82.05 m

Lowest Observed Discharge = 1.085 cumecs on 24/05/2017 Corres. Water Level :80.07 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	80.300	14.04	80.240	7.851 *	80.150	3.479	80.090	1.946	80.120	2.736	80.170	4.611
2	80.300	13.94	80.240	7.684	80.150	3.312	80.090	1.914	80.120	2.447 *	80.170	4.525
3	80.290	13.06	80.240	7.848	80.150	3.309	80.090	1.925	80.110	2.413	80.120	2.485
4	80.290	13.06 *	80.230	7.329	80.140	3.076	80.090	1.936	80.110	2.373	80.100	1.842
5	80.290	12.93	80.230	7.402	80.140	3.193 *	80.090	1.943 *	80.100	2.042	80.080	1.174
6	80.290	13.10	80.230	7.120	80.140	3.238	80.090	1.948	80.100	1.949	80.210	6.078
7	80.290	12.67	80.220	6.814	80.140	3.191	80.080	1.708	80.100	1.864	80.240	8.246 *
8	80.290	12.50	80.220	7.123 *	80.140	3.175	80.080	1.703	80.100	1.851	80.290	11.85
9	80.280	11.72	80.220	6.708	80.140	3.027	80.110	2.494	80.100	1.853 *	80.220	6.081
10	80.280	11.99	80.220	6.607	80.140	3.000	80.170	4.466	80.090	1.668	80.170	4.180 *
11	80.270	11.60 *	80.220	6.613	80.130	2.865	80.300	14.15	80.090	1.661	80.150	3.840
12	80.270	11.60 *	80.210	6.065	80.130	2.887 *	80.260	11.65 *	80.090	1.661	80.130	2.978
13	80.270	11.22	80.210	6.021	80.120	2.673	80.240	10.40 *	80.090	1.674	80.130	2.948
14	80.270	10.68	80.210	6.027	80.120	2.635	80.230	9.768			80.130	2.984 *
15	80.260	10.15	80.210	6.031 *	80.120	2.616	80.190	5.269	80.100	1.865	80.130	3.020
16	80.260	9.837	80.200	5.626	80.120	2.636	80.150	3.493	80.100	1.848 *	80.120	2.709
17	80.260	9.813	80.200		80.110	2.503	80.120	2.629	80.100	1.829	80.110	2.352
18	80.260	9.830 *	80.190	5.096	80.110	2.514	80.150	3.594	80.100	1.839	80.110	2.231
19	80.260	9.838	80.190	4.918	80.110	2.443 *	80.130	3.321 *	80.100	1.869	80.090	1.794
20	80.250	9.197	80.180	4.688	80.100	2.365	80.130	2.978	80.090	1.628	80.080	1.424
21	80.270	11.03	80.180	4.635	80.100	2.353	80.130	2.939	80.110	2.242	80.080	1.426 *
22	80.270	10.94	80.180	4.596 *	80.100	2.415	80.120	2.761	80.110	2.319	80.080	1.428
23	80.270	10.31	80.170	4.295	80.100	2.392	80.150	3.420	80.090	1.758 *	80.090	1.676
24	80.260	9.964	80.170	4.240	80.100	2.375 *	80.150	3.403	80.090	1.470	80.070	1.085
25	80.260	9.398 *	80.170	4.291	80.100	2.353	80.140	3.043	80.090	1.555	80.110	2.501
26	80.260	9.400	80.160	3.911 *	80.100	2.400 *	80.140	3.024 *	80.080	1.258	80.100	1.674
27	80.260	9.314	80.160	3.782	80.080	1.740	80.140	3.000	80.080	1.231	80.230	10.02
28	80.260	9.165	80.160	3.831	80.080	1.784	80.130	2.863	80.080	1.253	80.150	3.400 *
29	80.250	8.757	80.160	3.618 *			80.130	2.884	80.170	4.874	80.190	6.139
30	80.250	8.610	80.150	3.537			80.130	2.846	80.170	4.739 *	80.150	3.501
31	80.240	7.905	80.150	3.455			80.130	2.808			80.140	3.016
Ten-Daily Mean												
I Ten-Daily	80.290	12.90	80.229	7.249	80.143	3.200	80.098	2.198	80.105	2.120	80.177	5.107
II Ten-Daily	80.263	10.38	80.202	5.676	80.117	2.614	80.190	6.725	80.096	1.764	80.118	2.628
III Ten-Daily	80.259	9.526	80.165	4.017	80.095	2.227	80.135	2.999	80.107	2.270	80.126	3.261
Monthly												
Min.	80.240	7.905	80.150	3.455	80.080	1.740	80.080	1.703	80.080	1.231	80.070	1.085
Max.	80.300	14.04	80.240	7.851	80.150	3.479	80.300	14.15	80.170	4.874	80.290	11.85
Mean	80.270	10.89	80.197	5.592	80.120	2.712	80.141	3.943	80.103	2.061	80.140	3.652

Peak Computed Discharge = 178.0 cumecs on 07/08/2016 Corres. Water Level :81.43 m

Lowest Computed Discharge = 1.426 cumecs on 21/05/2017 Corres. Water Level :80.08 m

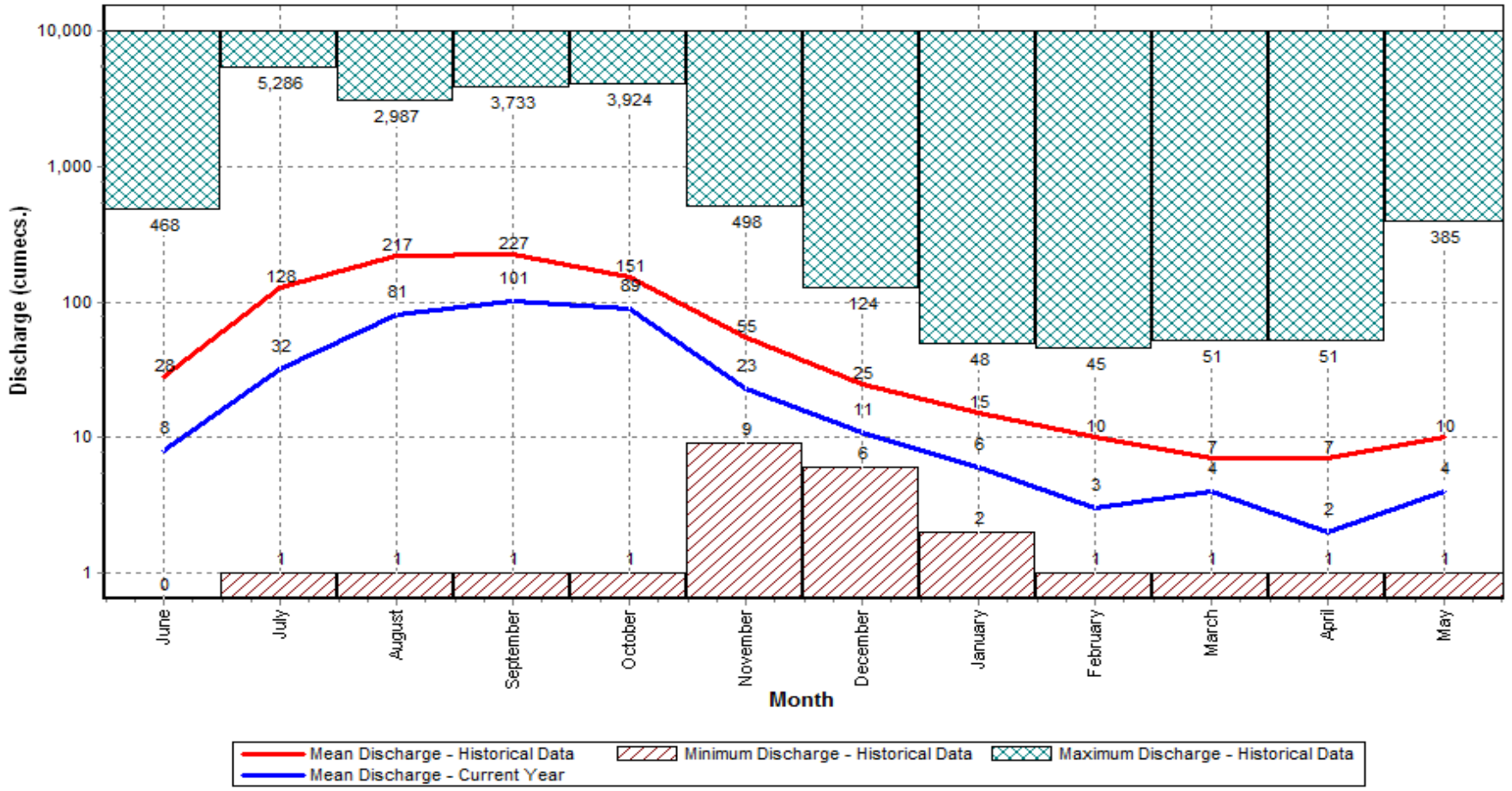
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

HISTOGRAM - HYDROGRAPH for Water Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Data considered : 1990-2017** **Division : E.E., Bhubaneswar**

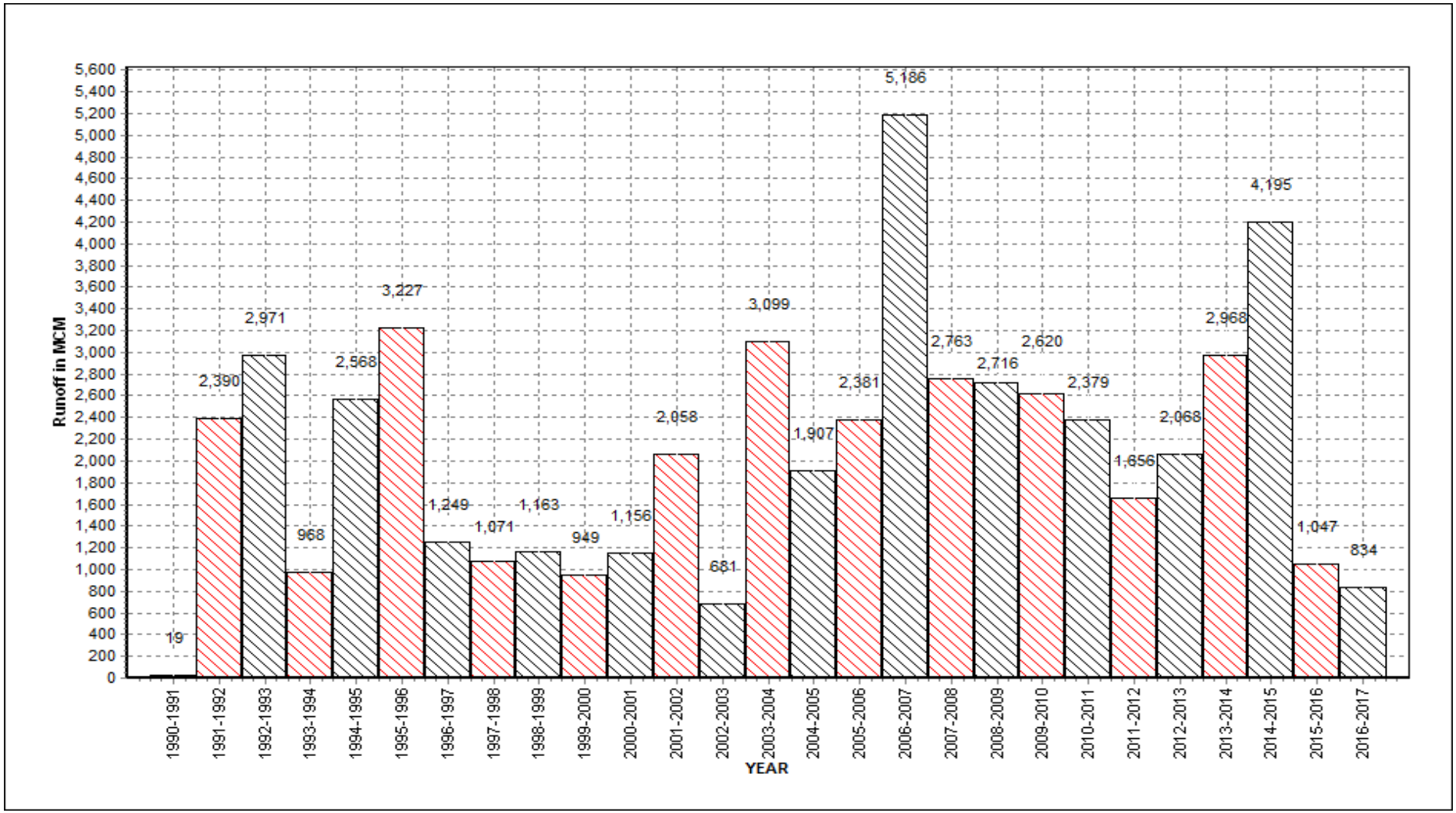
Local River : Vamsadhara **Sub-Division : Behrampur**



Annual Runoff Values for the period: 1990 - 2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

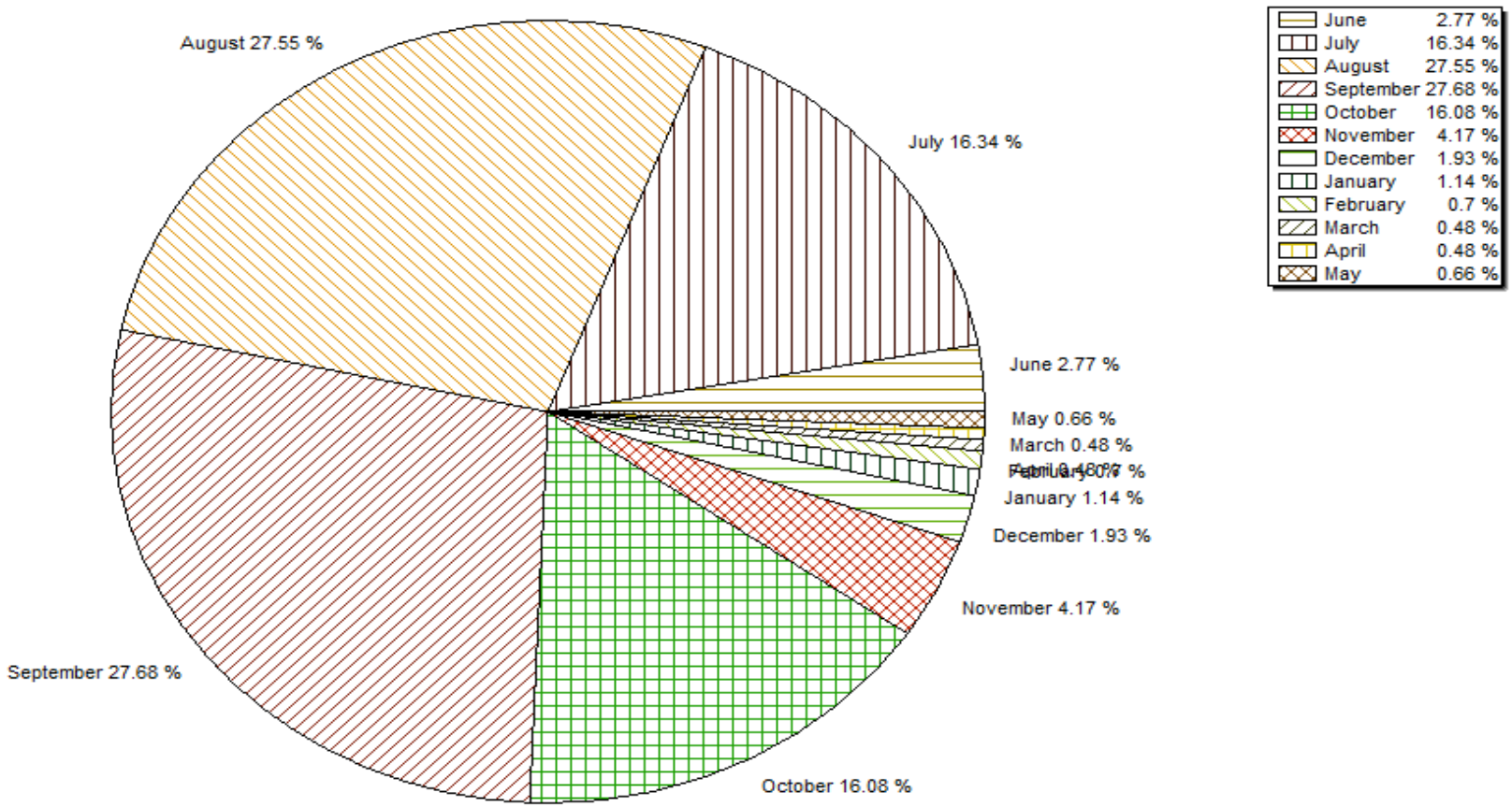


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period : 1990-2016

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

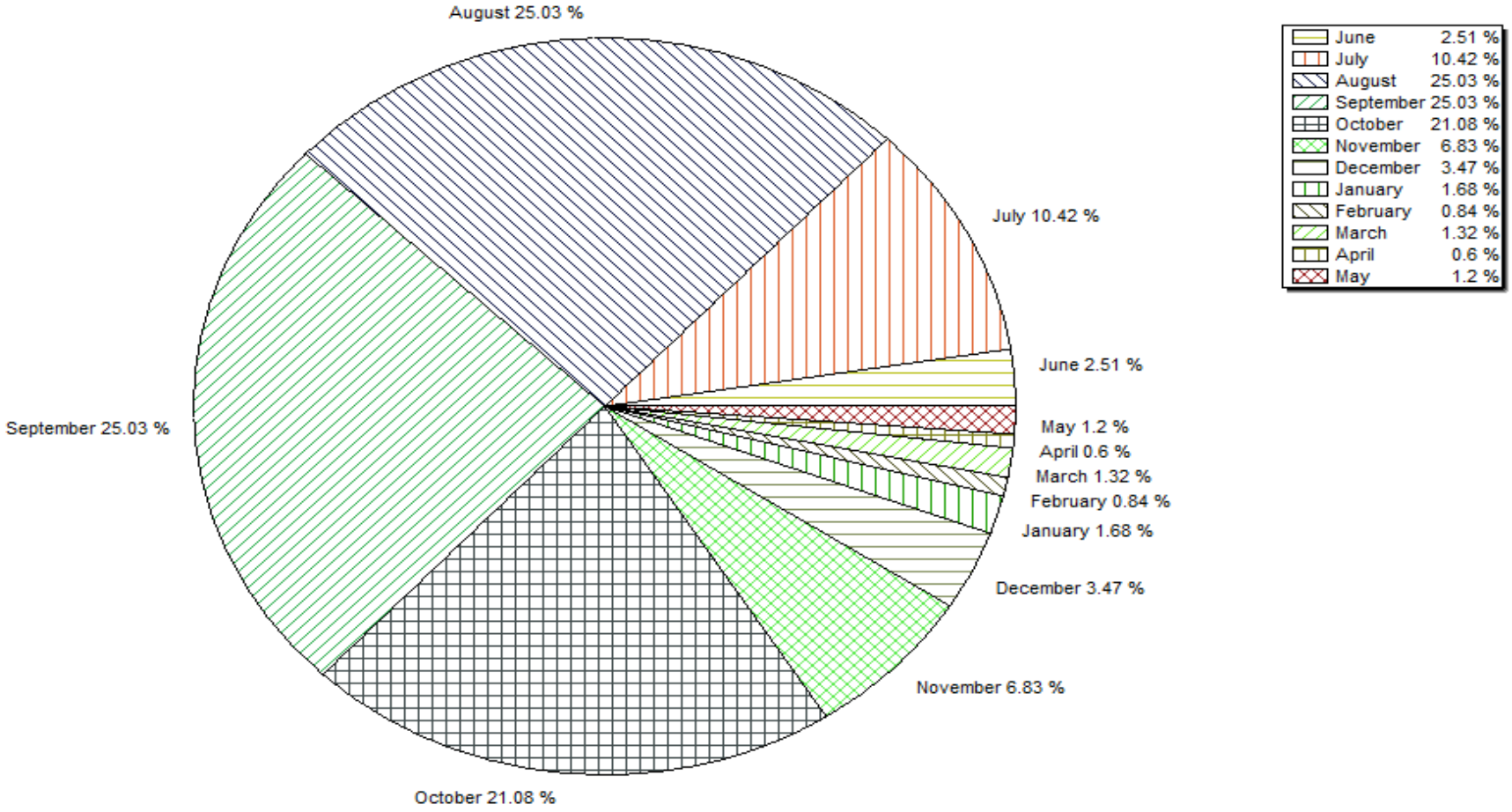
Local River : Vamsadhara **Sub-Division : Behrampur**



Monthly Runoff for the Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

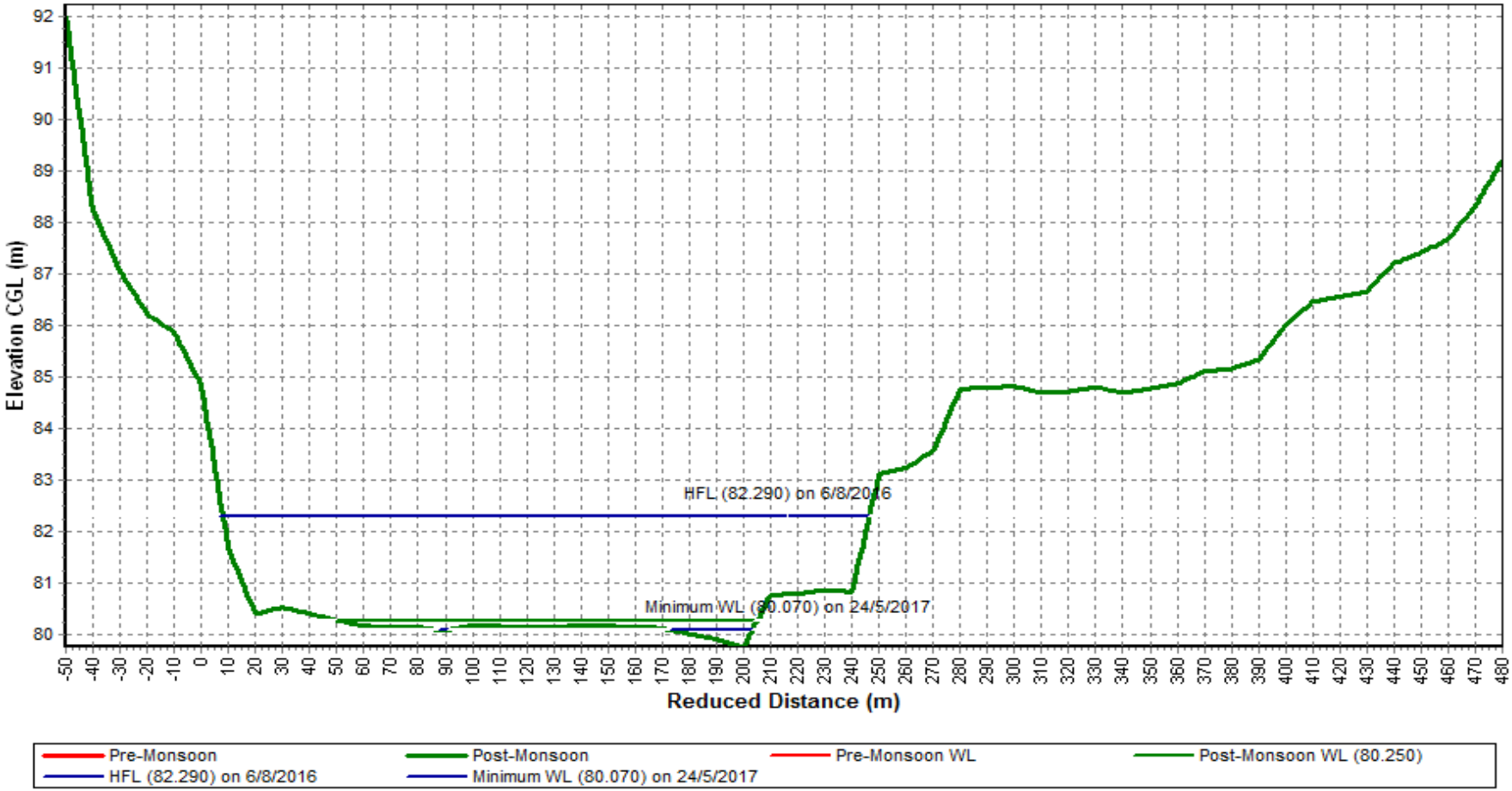
Local River : Vamsadhara **Sub-Division : Behrampur**



Pre-Monsoon & Post-Monsoon X-Section for Water Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

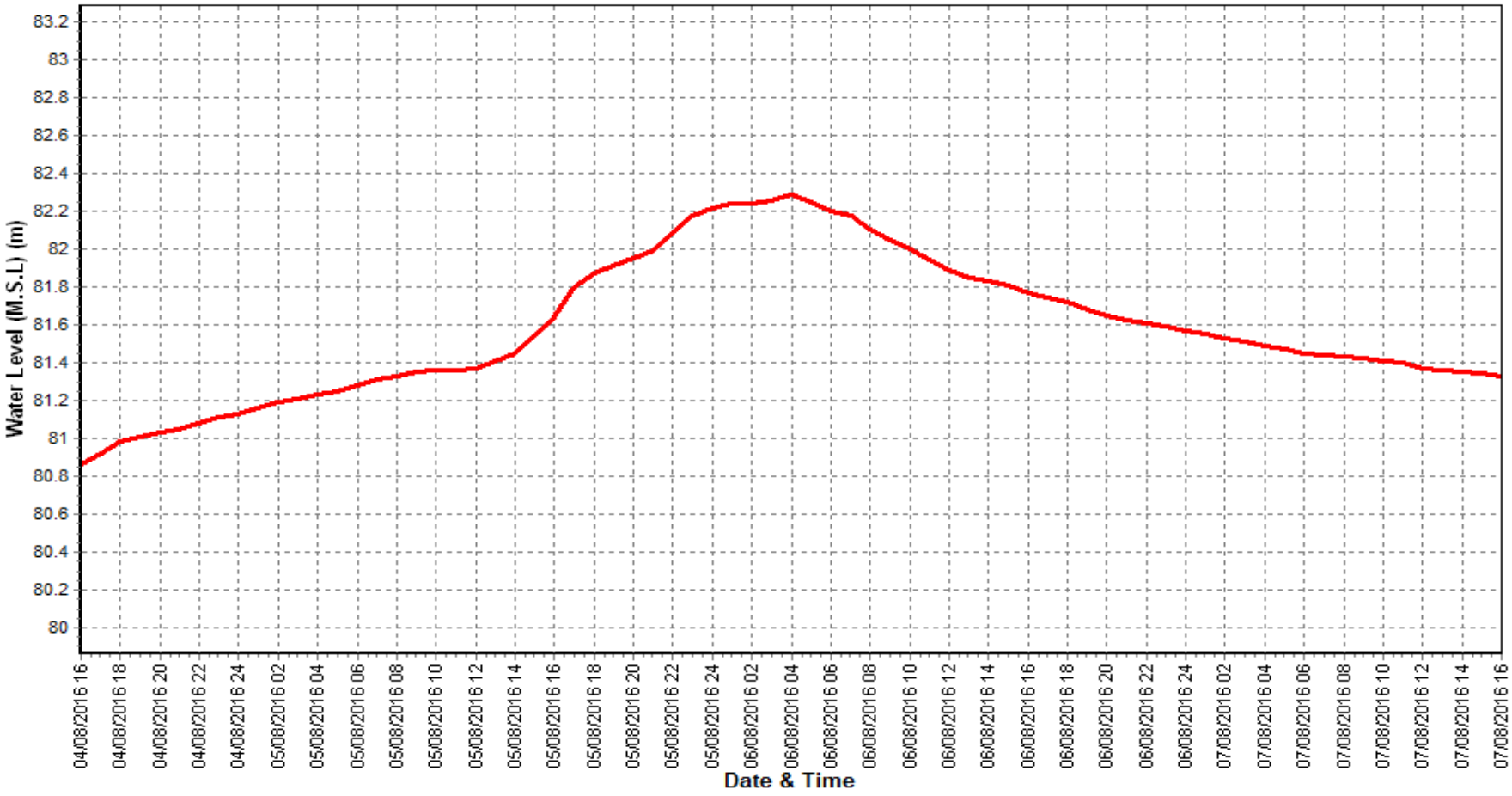
Local River : Vamsadhara **Sub-Division : Behrampur**



Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

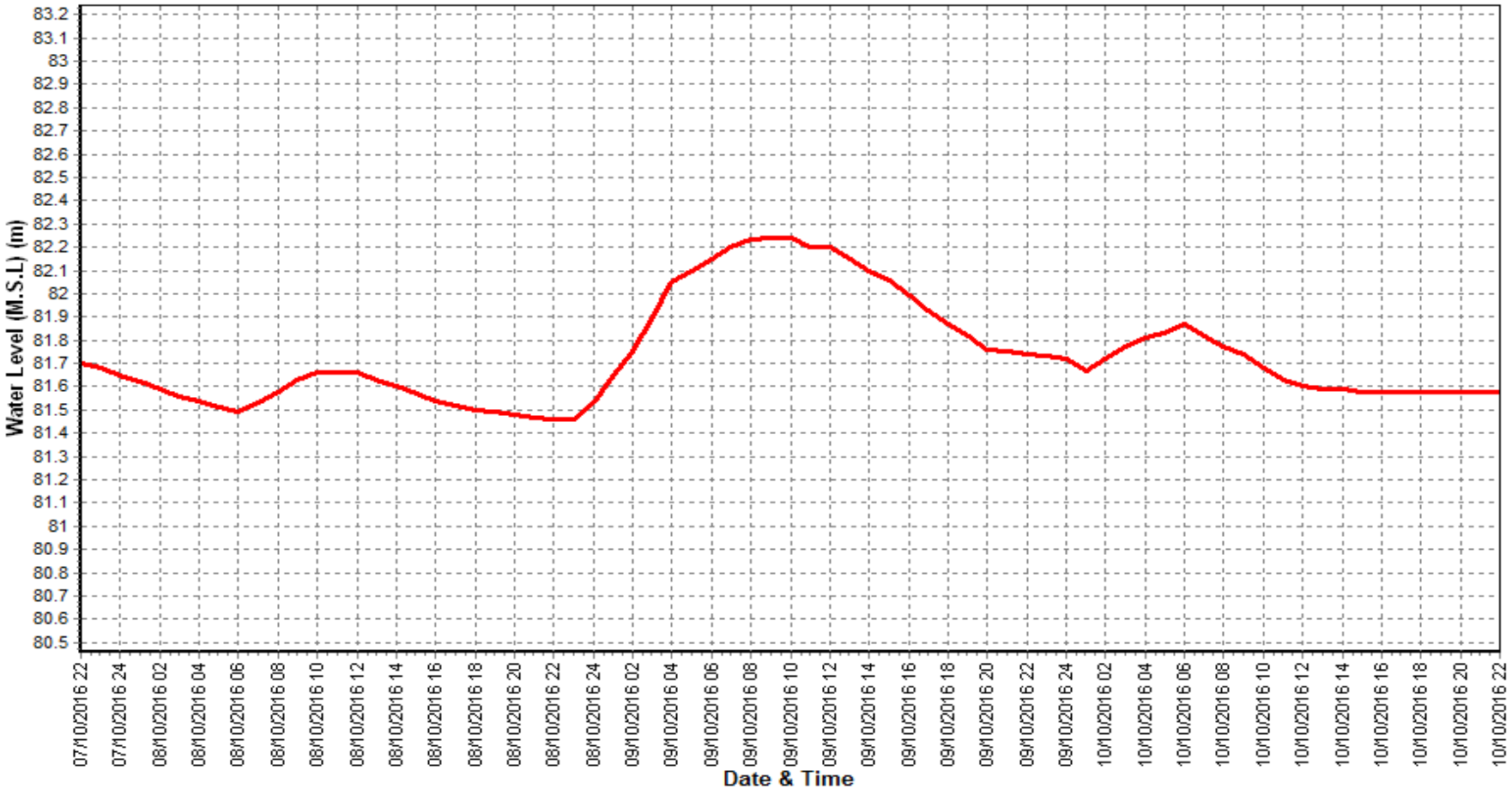


Time Span: 72 Hrs

Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

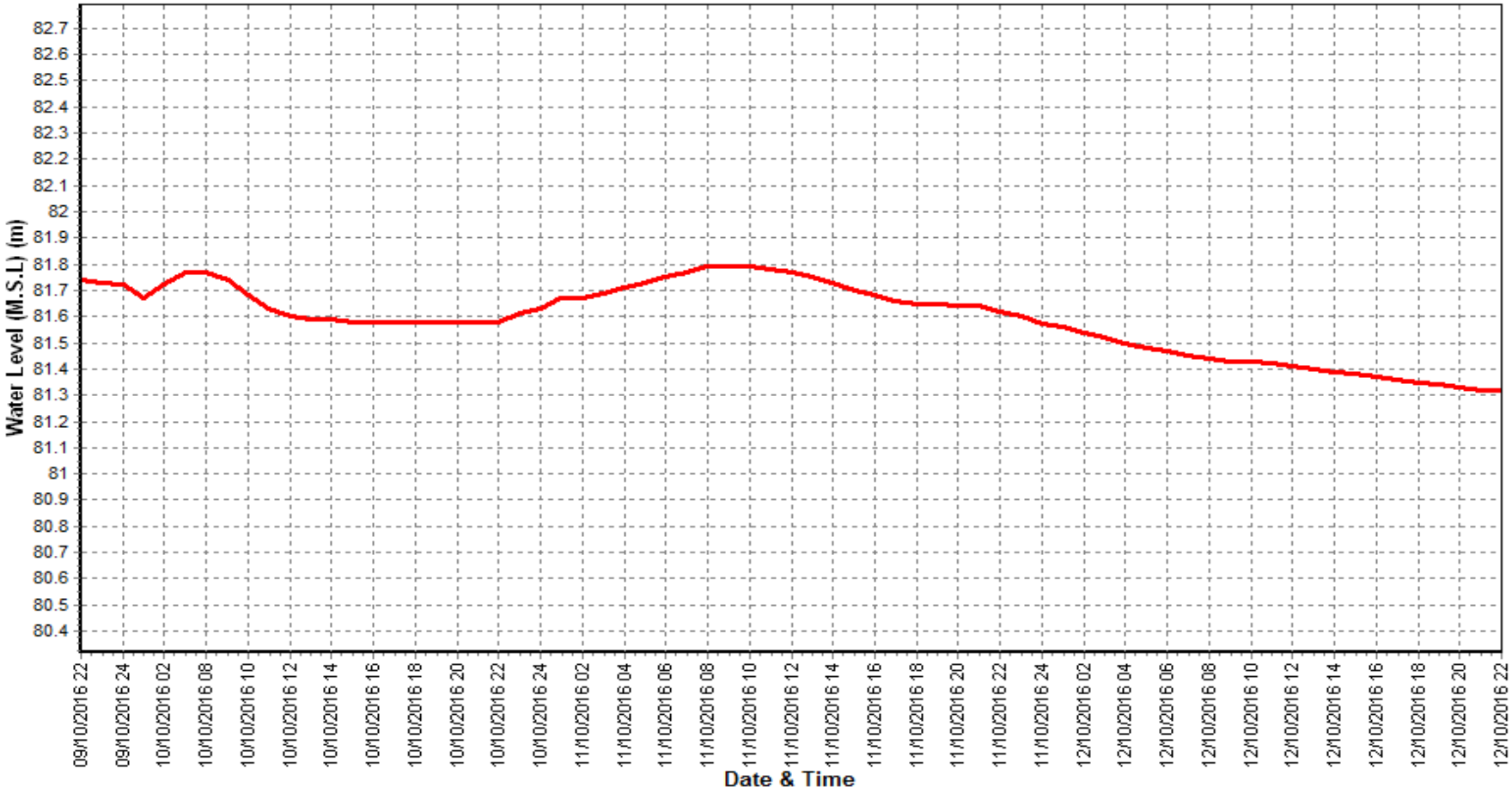


Time Span: 72 Hrs

Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**



Time Span: 72 Hrs

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Jun						Jul						Aug					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	1.375	0.000	0.000	0.406	0.406	48	11.84	0.000	0.000	0.471	0.471	482	28.27	0.000	0.000	0.190	0.190	464
2	1.400	0.000	0.000	0.366	0.366	44	37.19	0.000	0.000	0.079	0.079	253	66.07	0.000	0.000	0.156	0.156	891
3	8.087	0.000	0.000	0.872	0.872	610	122.7	0.000	0.000	0.260	0.260	2753	37.83	0.000	0.000	0.321	0.321	1050
4	6.392	0.000	0.000	0.384	0.384	212	32.43	0.000	0.000	0.154	0.154	431		0.000	0.000	0.193	0.193	
5	5.000	0.000	0.000	0.284	0.284	123	18.24	0.000	0.000	0.130	0.130	204	149.2	0.019	0.018	0.291	0.328	4233
6	3.124	0.000	0.000	0.444	0.444	120	14.27	0.000	0.000	0.159	0.159	195	393.3	0.089	0.095	0.240	0.425	14424
7	14.18	0.000	0.000	0.617	0.617	756	10.45	0.000	0.000	0.116	0.116	105	178.0	0.040	0.043	0.109	0.192	2954
8	4.524	0.000	0.000	0.425	0.425	166	8.642	0.000	0.000	0.071	0.071	53	181.9	0.034	0.035	0.092	0.161	2523
9	4.669	0.000	0.000	0.148	0.148	60	15.59	0.000	0.000	0.154	0.154	207	132.5	0.028	0.299	0.080	0.408	4667
10	14.08	0.000	0.000	0.310	0.310	377	16.52	0.000	0.000	0.163	0.163	233	78.12	0.000	0.000	0.081	0.081	546
11	9.134	0.000	0.000	0.211	0.211	166	65.97	0.000	0.000	0.071	0.071	406	71.75	0.000	0.000	0.013	0.013	80
12	6.000	0.000	0.000	0.138	0.138	72	61.57	0.000	0.000	0.056	0.056	295	184.8	0.031	0.032	0.024	0.087	1386
13	3.940	0.000	0.000	0.095	0.095	32	37.27	0.000	0.000	0.036	0.036	116	96.90	0.000	0.000	0.015	0.015	129
14	2.880	0.000	0.000	0.066	0.066	16	19.45	0.000	0.000	0.050	0.050	85	66.54	0.000	0.000	0.011	0.011	61
15	2.328	0.000	0.000	0.095	0.095	19	15.13	0.000	0.000	0.050	0.050	65	49.44	0.000	0.000	0.008	0.008	34
16	1.926	0.000	0.000	0.072	0.072	12	14.45	0.000	0.000	0.210	0.210	262	43.33	0.000	0.000	0.009	0.009	33
17	6.190	0.000	0.000	0.029	0.029	15	12.41	0.000	0.000	0.180	0.180	193	38.73	0.000	0.000	0.045	0.045	151
18	15.99	0.000	0.000	0.051	0.051	71	11.60	0.000	0.000	0.120	0.120	120	40.77	0.000	0.000	0.003	0.003	11
19	12.53	0.000	0.000	0.041	0.041	44	20.86	0.000	0.000	0.120	0.120	217	37.66	0.000	0.000	0.004	0.004	14
20	5.625	0.000	0.000	0.055	0.055	27	19.84	0.000	0.000	0.307	0.307	525	29.34	0.000	0.000	0.005	0.005	11
21	3.491	0.000	0.000	0.084	0.084	25	17.97	0.000	0.000	1.006	1.006	1562	24.02	0.000	0.000	0.004	0.004	8
22	2.875	0.000	0.000	0.102	0.102	25	91.61	0.000	0.000	0.108	0.108	852	17.80	0.000	0.000	0.011	0.011	16
23	2.711	0.000	0.000	0.068	0.068	16	56.35	0.000	0.000	0.440	0.440	2143	22.71	0.000	0.000	0.016	0.016	30
24	2.917	0.000	0.000	0.214	0.214	54	46.95	0.000	0.000	0.367	0.367	1487	58.80	0.000	0.000	0.080	0.080	408
25	8.882	0.000	0.000	0.176	0.176	135	62.57	0.000	0.000	0.105	0.105	569	62.02	0.000	0.000	0.038	0.038	201
26	11.12	0.000	0.000	0.000	0.000	0	28.58	0.000	0.000	0.046	0.046	115	44.21	0.000	0.000	0.025	0.025	95
27	17.46	0.000	0.000	0.128	0.128	193	33.87	0.000	0.000	0.014	0.014	42	73.94	0.000	0.000	0.123	0.123	783
28	31.19	0.000	0.000	0.104	0.104	280	26.09	0.000	0.000	0.165	0.165	371	77.58	0.000	0.000	0.129	0.129	861
29	19.84	0.000	0.000	0.118	0.118	202	25.13	0.000	0.000	0.163	0.163	354	50.84	0.000	0.000	0.046	0.046	204
30	12.16	0.000	0.000	0.151	0.151	158	20.76	0.000	0.000	0.042	0.042	75	42.51	0.000	0.000	0.034	0.034	125
31							27.19	0.000	0.000	0.055	0.055	129	41.29	0.000	0.000	0.063	0.063	223
Ten Daily Mean																		
Ten Daily I	6.283	0.000	0.000	0.426	0.426	252	28.79	0.000	0.000	0.176	0.176	492	138.4	0.021	0.049	0.175	0.245	3528
Ten Daily II	6.654	0.000	0.000	0.085	0.085	48	27.86	0.000	0.000	0.120	0.120	229	65.93	0.003	0.003	0.014	0.020	191
Ten Daily III	11.26	0.000	0.000	0.114	0.114	109	39.73	0.000	0.000	0.228	0.228	700	46.88	0.000	0.000	0.052	0.052	269
Monthly																		
Total						4080						14901						36617

Annual Sediment Load (Metric Tonnes) : 93443

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Sep						Oct						Nov					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	33.76	0.000	0.000	0.023	0.023	66	154.0	0.046	0.051	0.219	0.316	4209	29.94	0.000	0.000	0.006	0.006	16
2	36.44	0.000	0.000	0.014	0.014	43		0.055	0.060	0.259	0.374		29.14	0.000	0.000	0.009	0.009	22
3	35.12	0.000	0.000	0.040	0.040	122	136.8	0.011	0.015	0.026	0.052	612		0.000	0.000	0.013	0.013	
4		0.000	0.000	0.113	0.113		178.6	0.036	0.037	0.046	0.119	1838	29.09	0.000	0.000	0.008	0.008	20
5	135.5	0.030	0.031	0.178	0.238	2791	120.8	0.000	0.000	0.057	0.057	591	28.94	0.000	0.000	0.006	0.006	16
6	128.4	0.029	0.030	0.096	0.154	1712	117.0	0.000	0.000	0.025	0.025	251	28.50	0.000	0.000	0.006	0.006	16
7	81.13	0.000	0.000	0.021	0.021	150	120.9	0.000	0.000	0.015	0.015	160	28.50	0.000	0.000	0.008	0.008	20
8	70.33	0.000	0.000	0.027	0.027	165	231.5	0.023	0.025	0.031	0.079	1572	28.53	0.000	0.000	0.008	0.008	20
9	51.21	0.000	0.000	0.021	0.021	92		0.038	0.043	0.052	0.133		27.81	0.000	0.000	0.008	0.008	19
10	46.54	0.000	0.000	0.022	0.022	88		0.027	0.030	0.036	0.092		27.92	0.000	0.000	0.008	0.008	20
11		0.000	0.000	0.047	0.047			0.027	0.030	0.037	0.094		27.11	0.000	0.000	0.007	0.007	15
12	102.0	0.000	0.000	0.084	0.084	739		0.018	0.020	0.024	0.062		26.34	0.000	0.000	0.006	0.006	15
13		0.000	0.000	0.066	0.066		130.1	0.024	0.028	0.034	0.085	954	24.45	0.000	0.000	0.006	0.006	12
14	107.7	0.000	0.000	0.044	0.044	406	115.8	0.000	0.000	0.080	0.080	801	23.50	0.000	0.000	0.006	0.006	12
15	125.9	0.030	0.031	0.199	0.259	2822	101.0	0.000	0.000	0.057	0.057	500	22.02	0.000	0.000	0.006	0.006	11
16	139.0	0.030	0.032	0.095	0.157	1889		0.000	0.000	0.053	0.053		21.21	0.000	0.000	0.006	0.006	10
17	84.26	0.000	0.000	0.036	0.036	265	83.24	0.000	0.000	0.019	0.019	137	19.80	0.000	0.000	0.006	0.006	10
18		0.000	0.000	0.029	0.029		76.42	0.000	0.000	0.018	0.018	116	19.88	0.000	0.000	0.006	0.006	10
19	153.0	0.038	0.043	0.088	0.168	2219	68.34	0.000	0.000	0.016	0.016	95	20.10	0.000	0.000	0.006	0.006	10
20	121.0	0.000	0.000	0.080	0.080	831	59.32	0.000	0.000	0.018	0.018	91	20.00	0.000	0.000	0.006	0.006	10
21	106.7	0.000	0.000	0.038	0.038	348	52.85	0.000	0.000	0.021	0.021	94	19.50	0.000	0.000	0.005	0.005	8
22	85.75	0.000	0.000	0.017	0.017	126	43.52	0.000	0.000	0.022	0.022	81	18.82	0.000	0.000	0.005	0.005	8
23	110.6	0.000	0.000	0.034	0.034	323		0.000	0.000	0.021	0.021		18.77	0.000	0.000	0.006	0.006	9
24	163.0	0.039	0.046	0.079	0.164	2311	40.65	0.000	0.000	0.010	0.010	37	18.70	0.000	0.000	0.006	0.006	9
25		0.037	0.043	0.073	0.152		38.16	0.000	0.000	0.008	0.008	25	17.60	0.000	0.000	0.003	0.003	5
26	119.4	0.000	0.000	0.032	0.032	325	37.02	0.000	0.000	0.010	0.010	33	17.39	0.000	0.000	0.003	0.003	5
27	137.6	0.031	0.033	0.063	0.127	1511	35.16	0.000	0.000	0.009	0.009	28	16.50	0.000	0.000	0.003	0.003	4
28		0.000	0.000	0.112	0.112		31.89	0.000	0.000	0.008	0.008	21	15.58	0.000	0.000	0.004	0.004	5
29	108.0	0.000	0.000	0.090	0.090	837	31.46	0.000	0.000	0.008	0.008	23	15.63	0.000	0.000	0.004	0.004	5
30	131.0	0.028	0.031	0.366	0.424	4802		0.000	0.000	0.008	0.008		14.07	0.000	0.000	0.004	0.004	5
31							31.35	0.000	0.000	0.008	0.008	21						
Ten Daily Mean																		
Ten Daily I	68.72	0.006	0.006	0.055	0.067	581	151.4	0.024	0.026	0.077	0.126	1319	28.71	0.000	0.000	0.008	0.008	19
Ten Daily II	119.0	0.010	0.011	0.077	0.097	1310	90.61	0.007	0.008	0.036	0.050	385	22.44	0.000	0.000	0.006	0.006	12
Ten Daily III	120.3	0.013	0.015	0.090	0.119	1323	38.01	0.000	0.000	0.012	0.012	40	17.26	0.000	0.000	0.004	0.004	6
Monthly																		
Total						24982						12290						350

Annual Sediment Load (Metric Tonnes) : 93443

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Dec						Jan						Feb					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	14.04	0.000	0.000	0.004	0.004	5	7.851	0.000	0.000	0.003	0.003	2	3.479	0.000	0.000	0.002	0.002	0
2	13.94	0.000	0.000	0.004	0.004	5	7.684	0.000	0.000	0.003	0.003	2	3.312	0.000	0.000	0.002	0.002	0
3	13.06	0.000	0.000	0.004	0.004	4	7.848	0.000	0.000	0.003	0.003	2	3.309	0.000	0.000	0.002	0.002	0
4	13.06	0.000	0.000	0.004	0.004	4	7.329	0.000	0.000	0.003	0.003	2	3.076	0.000	0.000	0.001	0.001	0
5	12.93	0.000	0.000	0.004	0.004	4	7.402	0.000	0.000	0.003	0.003	2	3.193	0.000	0.000	0.001	0.001	0
6	13.10	0.000	0.000	0.004	0.004	4	7.120	0.000	0.000	0.003	0.003	2	3.238	0.000	0.000	0.002	0.002	0
7	12.67	0.000	0.000	0.004	0.004	4	6.814	0.000	0.000	0.002	0.002	1	3.191	0.000	0.000	0.002	0.002	0
8	12.50	0.000	0.000	0.004	0.004	4	7.123	0.000	0.000	0.002	0.002	1	3.175	0.000	0.000	0.002	0.002	0
9	11.72	0.000	0.000	0.003	0.003	3	6.708	0.000	0.000	0.003	0.003	2	3.027	0.000	0.000	0.001	0.001	0
10	11.99	0.000	0.000	0.004	0.004	4	6.607	0.000	0.000	0.003	0.003	1	3.000	0.000	0.000	0.001	0.001	0
11	11.60	0.000	0.000	0.003	0.003	3	6.613	0.000	0.000	0.003	0.003	1	2.865	0.000	0.000	0.001	0.001	0
12	11.60	0.000	0.000	0.003	0.003	3	6.065	0.000	0.000	0.002	0.002	1	2.887	0.000	0.000	0.001	0.001	0
13	11.22	0.000	0.000	0.004	0.004	4	6.021	0.000	0.000	0.002	0.002	1	2.673	0.000	0.000	0.001	0.001	0
14	10.68	0.000	0.000	0.004	0.004	4	6.027	0.000	0.000	0.002	0.002	1	2.635	0.000	0.000	0.001	0.001	0
15	10.15	0.000	0.000	0.004	0.004	3	6.031	0.000	0.000	0.002	0.002	1	2.616	0.000	0.000	0.001	0.001	0
16	9.837	0.000	0.000	0.004	0.004	3	5.626	0.000	0.000	0.002	0.002	1	2.636	0.000	0.000	0.001	0.001	0
17	9.813	0.000	0.000	0.004	0.004	3		0.000	0.000	0.002	0.002		2.503	0.000	0.000	0.001	0.001	0
18	9.830	0.000	0.000	0.004	0.004	3	5.096	0.000	0.000	0.002	0.002	1	2.514	0.000	0.000	0.001	0.001	0
19	9.838	0.000	0.000	0.004	0.004	3	4.918	0.000	0.000	0.002	0.002	1	2.443	0.000	0.000	0.001	0.001	0
20	9.197	0.000	0.000	0.004	0.004	3	4.688	0.000	0.000	0.002	0.002	1	2.365	0.000	0.000	0.001	0.001	0
21	11.03	0.000	0.000	0.004	0.004	4	4.635	0.000	0.000	0.002	0.002	1	2.353	0.000	0.000	0.001	0.001	0
22	10.94	0.000	0.000	0.004	0.004	4	4.596	0.000	0.000	0.002	0.002	1	2.415	0.000	0.000	0.001	0.001	0
23	10.31	0.000	0.000	0.004	0.004	3	4.295	0.000	0.000	0.002	0.002	1	2.392	0.000	0.000	0.001	0.001	0
24	9.964	0.000	0.000	0.004	0.004	3	4.240	0.000	0.000	0.002	0.002	1	2.375	0.000	0.000	0.001	0.001	0
25	9.398	0.000	0.000	0.003	0.003	3	4.291	0.000	0.000	0.002	0.002	1	2.353	0.000	0.000	0.001	0.001	0
26	9.400	0.000	0.000	0.003	0.003	3	3.911	0.000	0.000	0.002	0.002	1	2.400	0.000	0.000	0.001	0.001	0
27	9.314	0.000	0.000	0.003	0.003	3	3.782	0.000	0.000	0.002	0.002	1	1.740	0.000	0.000	0.001	0.001	0
28	9.165	0.000	0.000	0.003	0.003	3	3.831	0.000	0.000	0.002	0.002	1	1.784	0.000	0.000	0.001	0.001	0
29	8.757	0.000	0.000	0.003	0.003	2	3.618	0.000	0.000	0.002	0.002	1						
30	8.610	0.000	0.000	0.003	0.003	2	3.537	0.000	0.000	0.002	0.002	0						
31	7.905	0.000	0.000	0.003	0.003	2	3.455	0.000	0.000	0.002	0.002	0						
Ten Daily Mean																		
Ten Daily I	12.90	0.000	0.000	0.004	0.004	4	7.249	0.000	0.000	0.003	0.003	2	3.200	0.000	0.000	0.001	0.001	0
Ten Daily II	10.38	0.000	0.000	0.004	0.004	3	5.676	0.000	0.000	0.002	0.002	1	2.614	0.000	0.000	0.001	0.001	0
Ten Daily III	9.526	0.000	0.000	0.003	0.003	3	4.017	0.000	0.000	0.002	0.002	1	2.227	0.000	0.000	0.001	0.001	0
Monthly																		
Total						104						32						9

Annual Sediment Load (Metric Tonnes) : 93443

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Mar						Apr						May					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	1.946	0.000	0.000	0.001	0.001	0	2.736	0.000	0.000	0.002	0.002	0	4.611	0.000	0.000	0.000	0.000	0
2	1.914	0.000	0.000	0.001	0.001	0	2.447	0.000	0.000	0.002	0.002	0	4.525	0.000	0.000	0.000	0.000	0
3	1.925	0.000	0.000	0.001	0.001	0	2.413	0.000	0.000	0.003	0.003	1	2.485	0.000	0.000	0.000	0.000	0
4	1.936	0.000	0.000	0.001	0.001	0	2.373	0.000	0.000	0.003	0.003	1	1.842	0.000	0.000	0.000	0.000	0
5	1.943	0.000	0.000	0.001	0.001	0	2.042	0.000	0.000	0.002	0.002	0	1.174	0.000	0.000	0.000	0.000	0
6	1.948	0.000	0.000	0.001	0.001	0	1.949	0.000	0.000	0.002	0.002	0	6.078	0.000	0.000	0.000	0.000	0
7	1.708	0.000	0.000	0.001	0.001	0	1.864	0.000	0.000	0.002	0.002	0	8.246	0.000	0.000	0.000	0.000	0
8	1.703	0.000	0.000	0.001	0.001	0	1.851	0.000	0.000	0.002	0.002	0	11.85	0.000	0.000	0.006	0.006	6
9	2.494	0.000	0.000	0.002	0.002	0	1.853	0.000	0.000	0.002	0.002	0	6.081	0.000	0.000	0.003	0.003	2
10	4.466	0.000	0.000	0.003	0.003	1	1.668	0.000	0.000	0.002	0.002	0	4.180	0.000	0.000	0.000	0.000	0
11	14.15	0.000	0.000	0.010	0.010	13	1.661	0.000	0.000	0.002	0.002	0	3.840	0.000	0.000	0.000	0.000	0
12	11.65	0.000	0.000	0.009	0.009	9	1.661	0.000	0.000	0.002	0.002	0	2.978	0.000	0.000	0.000	0.000	0
13	10.40	0.000	0.000	0.008	0.008	7	1.674	0.000	0.000	0.002	0.002	0	2.948	0.000	0.000	0.000	0.000	0
14	9.768	0.000	0.000	0.010	0.010	8							2.984	0.000	0.000	0.000	0.000	0
15	5.269	0.000	0.000	0.006	0.006	3	1.865	0.000	0.000	0.002	0.002	0	3.020	0.000	0.000	0.000	0.000	0
16	3.493	0.000	0.000	0.004	0.004	1	1.848	0.000	0.000	0.002	0.002	0	2.709	0.000	0.000	0.000	0.000	0
17	2.629	0.000	0.000	0.003	0.003	1	1.829	0.000	0.000	0.002	0.002	0	2.352	0.000	0.000	0.000	0.000	0
18	3.594	0.000	0.000	0.004	0.004	1	1.839	0.000	0.000	0.002	0.002	0	2.231	0.000	0.000	0.000	0.000	0
19	3.321	0.000	0.000	0.003	0.003	1	1.869	0.000	0.000	0.002	0.002	0	1.794	0.000	0.000	0.000	0.000	0
20	2.978	0.000	0.000	0.002	0.002	1	1.628	0.000	0.000	0.002	0.002	0	1.424	0.000	0.000	0.000	0.000	0
21	2.939	0.000	0.000	0.002	0.002	1	2.242	0.000	0.000	0.000	0.000	0	1.426	0.000	0.000	0.000	0.000	0
22	2.761	0.000	0.000	0.002	0.002	1	2.319	0.000	0.000	0.000	0.000	0	1.428	0.000	0.000	0.000	0.000	0
23	3.420	0.000	0.000	0.003	0.003	1	1.758	0.000	0.000	0.000	0.000	0	1.676	0.000	0.000	0.000	0.000	0
24	3.403	0.000	0.000	0.003	0.003	1	1.470	0.000	0.000	0.000	0.000	0	1.085	0.000	0.000	0.000	0.000	0
25	3.043	0.000	0.000	0.003	0.003	1	1.555	0.000	0.000	0.000	0.000	0	2.501	0.000	0.000	0.000	0.000	0
26	3.024	0.000	0.000	0.003	0.003	1	1.258	0.000	0.000	0.000	0.000	0	1.674	0.000	0.000	0.000	0.000	0
27	3.000	0.000	0.000	0.003	0.003	1	1.231	0.000	0.000	0.000	0.000	0	10.02	0.000	0.000	0.005	0.005	4
28	2.863	0.000	0.000	0.002	0.002	1	1.253	0.000	0.000	0.000	0.000	0	3.400	0.000	0.000	0.000	0.000	0
29	2.884	0.000	0.000	0.002	0.002	1	4.874	0.000	0.000	0.000	0.000	0	6.139	0.000	0.000	0.002	0.002	1
30	2.846	0.000	0.000	0.002	0.002	1	4.739	0.000	0.000	0.000	0.000	0	3.501	0.000	0.000	0.011	0.011	3
31	2.808	0.000	0.000	0.002	0.002	1							3.016	0.000	0.000	0.000	0.000	0
Ten Daily Mean																		
Ten Daily I	2.198	0.000	0.000	0.002	0.002	0	2.120	0.000	0.000	0.002	0.002	0	5.107	0.000	0.000	0.001	0.001	1
Ten Daily II	6.725	0.000	0.000	0.006	0.006	4	1.764	0.000	0.000	0.002	0.002	0	2.628	0.000	0.000	0.000	0.000	0
Ten Daily III	2.999	0.000	0.000	0.002	0.002	1	2.270	0.000	0.000	0.000	0.000	0	3.261	0.000	0.000	0.002	0.002	1
Monthly																		
Total						54						7						16

Annual Sediment Load (Metric Tonnes) : 93443

Annual Sediment Load for period : 2014-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

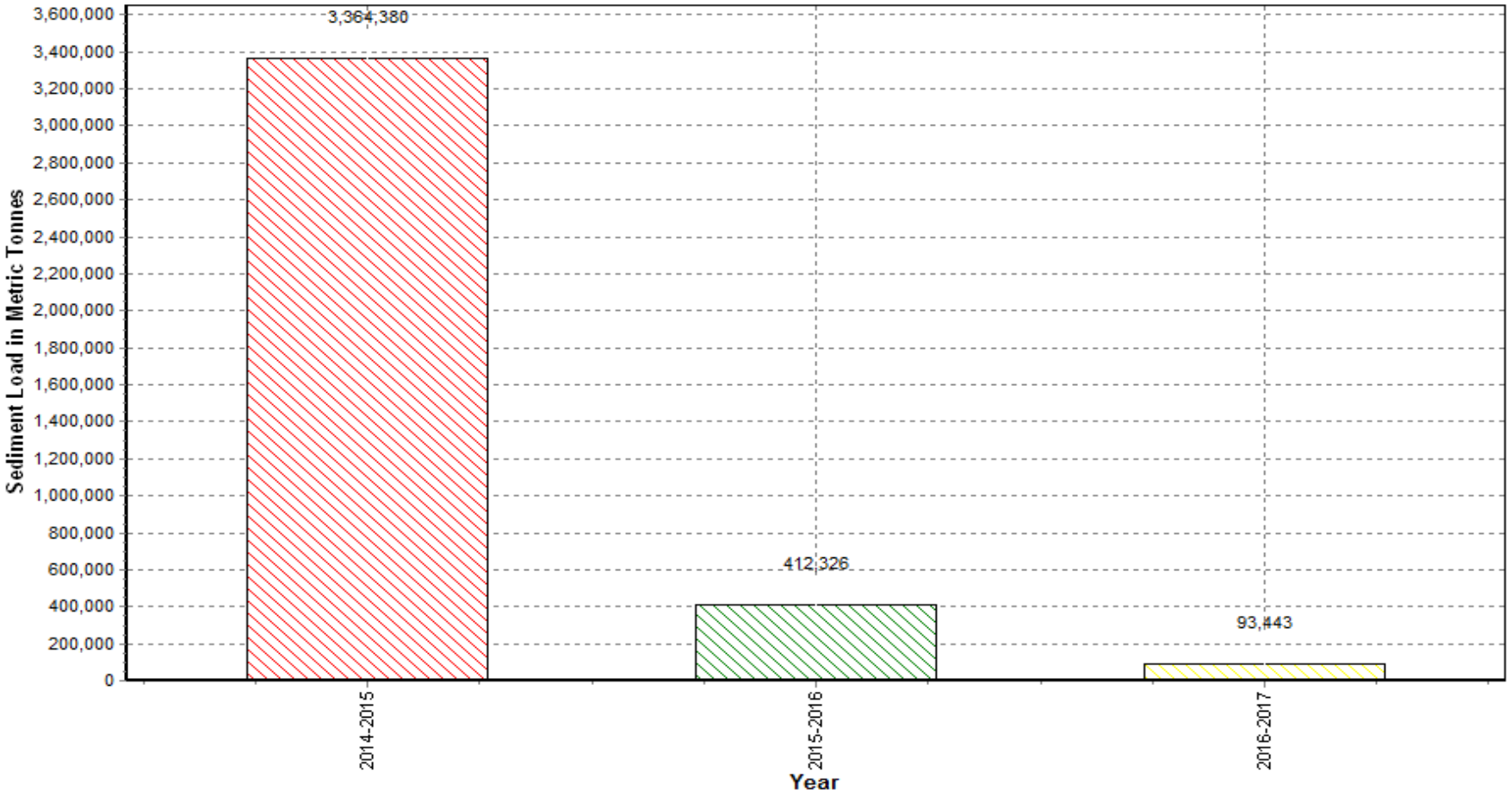
Local River : Vamsadhara **Sub-Division : Behrampur**

Year	Monsoon (M.T.)	Non-Monsoon (M.T.)	Annual Load (M.T.)	Annual Run Off (MCM)
2014-2015	3351292	13088	3364380	4195
2015-2016	409630	2696	412326	1047
2016-2017	93220	223	93443	834

Annual Sediment Load for the period: 2014-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**



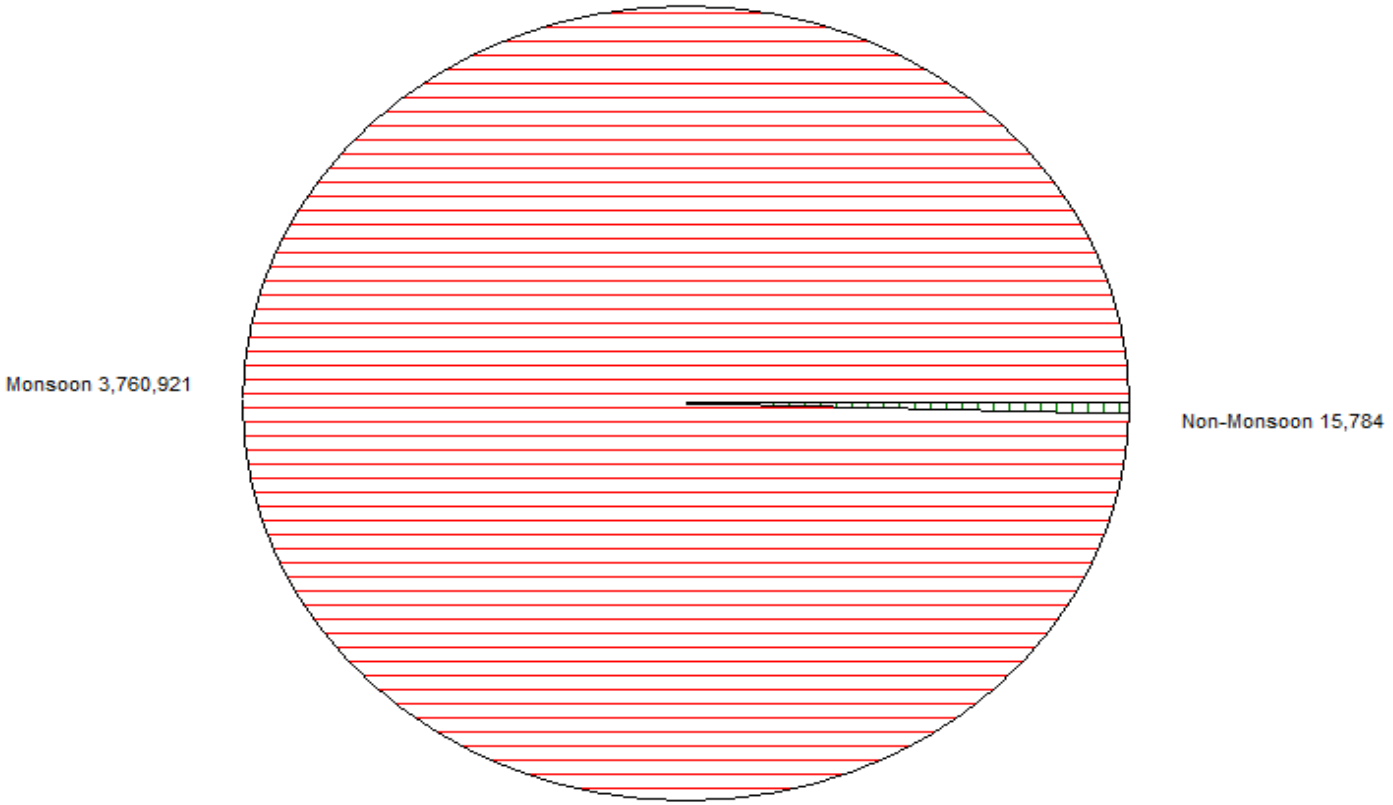
Seasonal Sediment Load for the period : 2014-2016

Station Name : GUNUPUR (AV000K9)

Local River : Vamsadhara

Division : E.E., Bhubaneswar

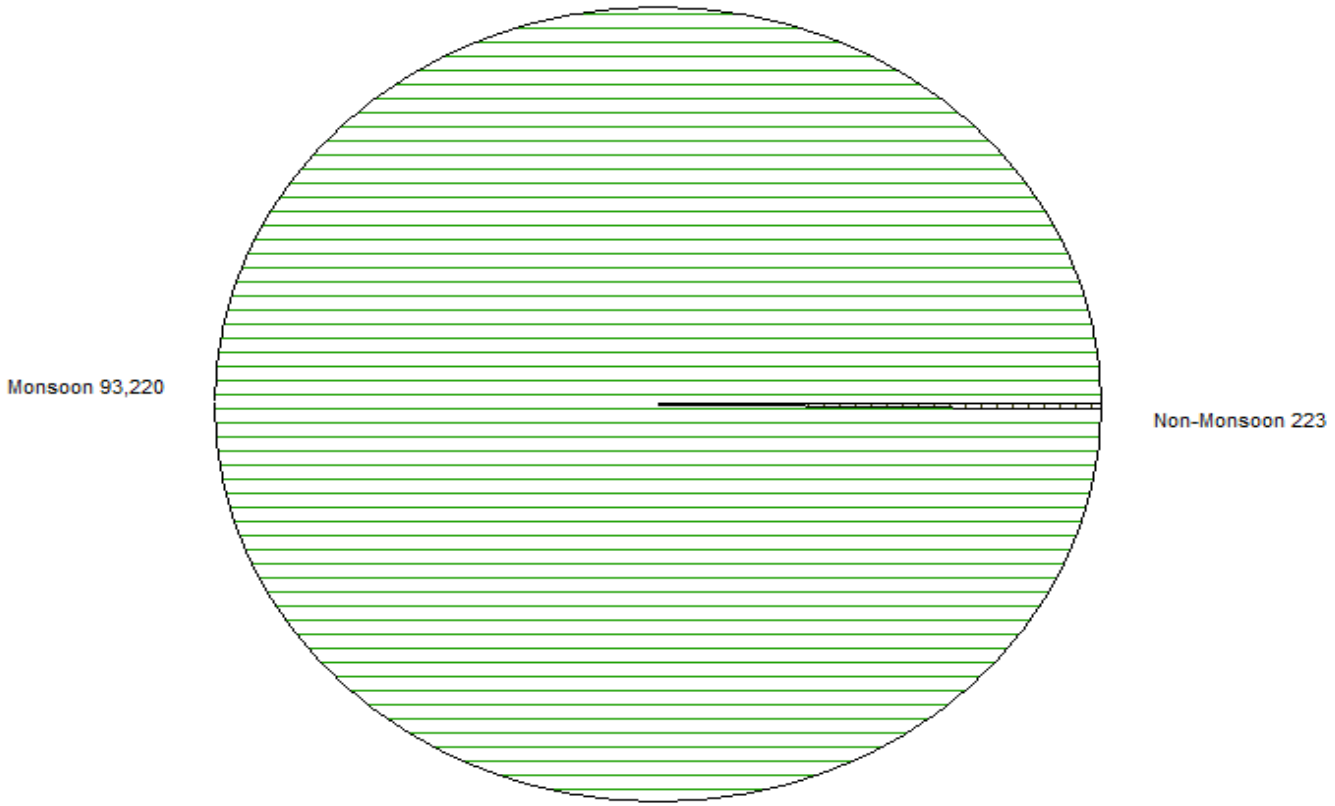
Sub-Division : Behrampur



Seasonal Sediment Load for the Year: 2016-2017

Station Name : GUNUPUR (AV000K9)
Local River : Vamsadhara

Division : E.E., Bhubaneswar
Sub-Division : Behrampur



Water Quality Datasheet for the period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **River Water Analysis** **Sub-Division : Behrampur**

S.No	Parameters	6/1/2016	8/1/2016	10/1/2016	12/1/2016	2/1/2017	4/1/2017
		A	A	A	A	A	A
	PHYSICAL						
1	Q (cumec)						
2	Colour_Cod (-)	Clear	Light Brown	Light Brown	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	288	148	102	550	315	654
4	EC_GEN (µmho/cm)	290	151	106	553	318	659
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	7.4	7.6	7.1	7.7	7.7	7.8
7	pH_GEN (pH units)	7.5	7.7	7.2	7.8	7.8	8.0
8	Temp (deg C)	27.0	29.0	28.0	30.0	21.0	23.0
	CHEMICAL						
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	102	106	46	51	55	65
3	B (mg/L)	0.02	0.02	0.02	0.01	0.01	0.03
4	Ca (mg/L)	45	46	32	34	37	38
5	Cl (mg/L)	54.7	17.0	5.7	7.5	28.3	35.8
6	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)	0.2	1.1	0.2	0.9	0.6	0.5
9	HCO3 (mg/L)	124	130	56	62	68	79
10	K (mg/L)	3.9	8.9	10.7	11.0	11.6	11.9
11	Mg (mg/L)	21.4	22.4	18.9	10.7	11.7	12.6
12	Na (mg/L)	11.3	36.5	18.5	20.6	95.8	90.1
13	NO2+NO3 (mg N/L)	0.81	1.18	1.01	1.21	1.11	0.99
14	NO2-N (mgN/L)	0.03	0.07	0.01	0.00	0.01	0.03
15	NO3-N (mgN/L)	0.78	1.11	0.99	1.21	1.09	0.97
16	P-Tot (mgP/L)	0.010	0.010	0.010	0.010	0.010	0.010
17	SiO2 (mg/L)	7.0	6.0	7.0	6.0	7.5	7.0
18	SO4 (mg/L)	3.6	3.8	15.7	15.8	15.9	16.0
	BIOLOGICAL/BACTERIOLOGICAL						
	TRACE & TOXIC						
	CHEMICAL INDICES						
1	HAR_Ca (mgCaCO3/L)	112	116	80	84	92	96
2	HAR_Total (mgCaCO3/L)	201	209	159	129	141	149
3	Na% (%)	11	27	19	24	57	55
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	0.3	1.1	0.6	0.8	3.5	3.2
	PESTICIDES						

Water Quality Summary for the period : 2016-2017

Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

River Water Summary

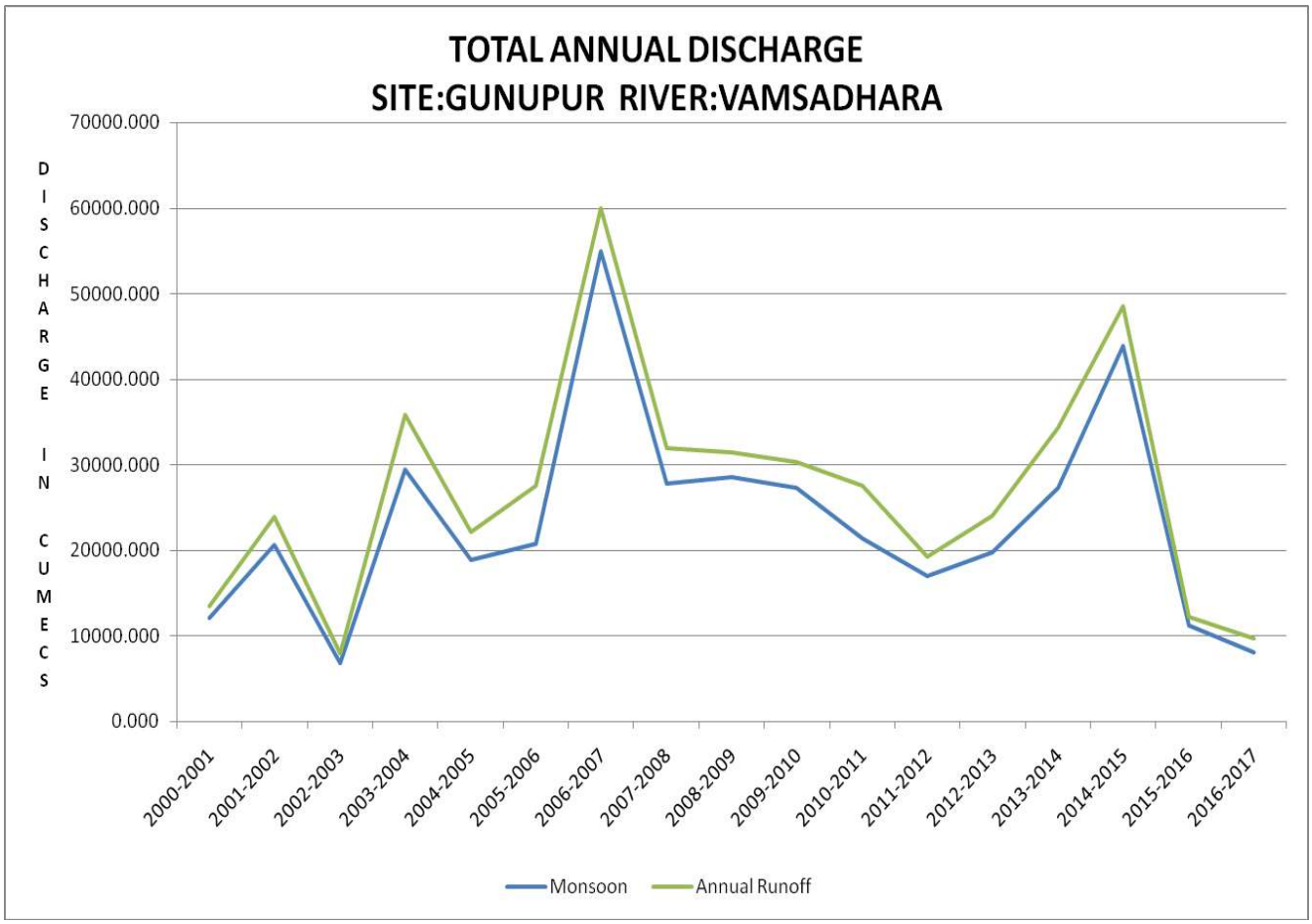
S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)				
2	EC_FLD (µmho/cm)	6	654	102	343
3	EC_GEN (µmho/cm)	6	659	106	346
4	pH_FLD (pH units)	6	7.8	7.1	7.6
5	pH_GEN (pH units)	6	8.0	7.2	7.7
6	Temp (deg C)	6	30.0	21.0	26.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	106	46	71
3	B (mg/L)	6	0.03	0.01	0.02
4	Ca (mg/L)	6	46	32	39
5	Cl (mg/L)	6	54.7	5.7	24.8
6	CO3 (mg/L)	6	0.0	0.0	0
7	F (mg/L)	6	0.05	0.05	0.05
8	Fe (mg/L)	6	1.1	0.2	0.6
9	HCO3 (mg/L)	6	130	56	86
10	K (mg/L)	6	11.9	3.9	9.7
11	Mg (mg/L)	6	22.4	10.7	16.3
12	Na (mg/L)	6	95.8	11.3	45.5
13	NO2+NO3 (mg N/L)	6	1.21	0.81	1.05
14	NO2-N (mgN/L)	6	0.07	0.00	0.03
15	NO3-N (mgN/L)	6	1.21	0.78	1.03
16	P-Tot (mgP/L)	6	0.010	0.010	0.01
17	SiO2 (mg/L)	6	7.5	6.0	6.8
18	SO4 (mg/L)	6	16.0	3.6	11.8
	BIOLOGICAL/BACTERIOLOGICAL				
	TRACE & TOXIC				
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	116	80	97
2	HAR_Total (mgCaCO3/L)	6	209	129	165
3	Na% (%)	6	57	11	32
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	3.5	0.3	1.6
	PESTICIDES				

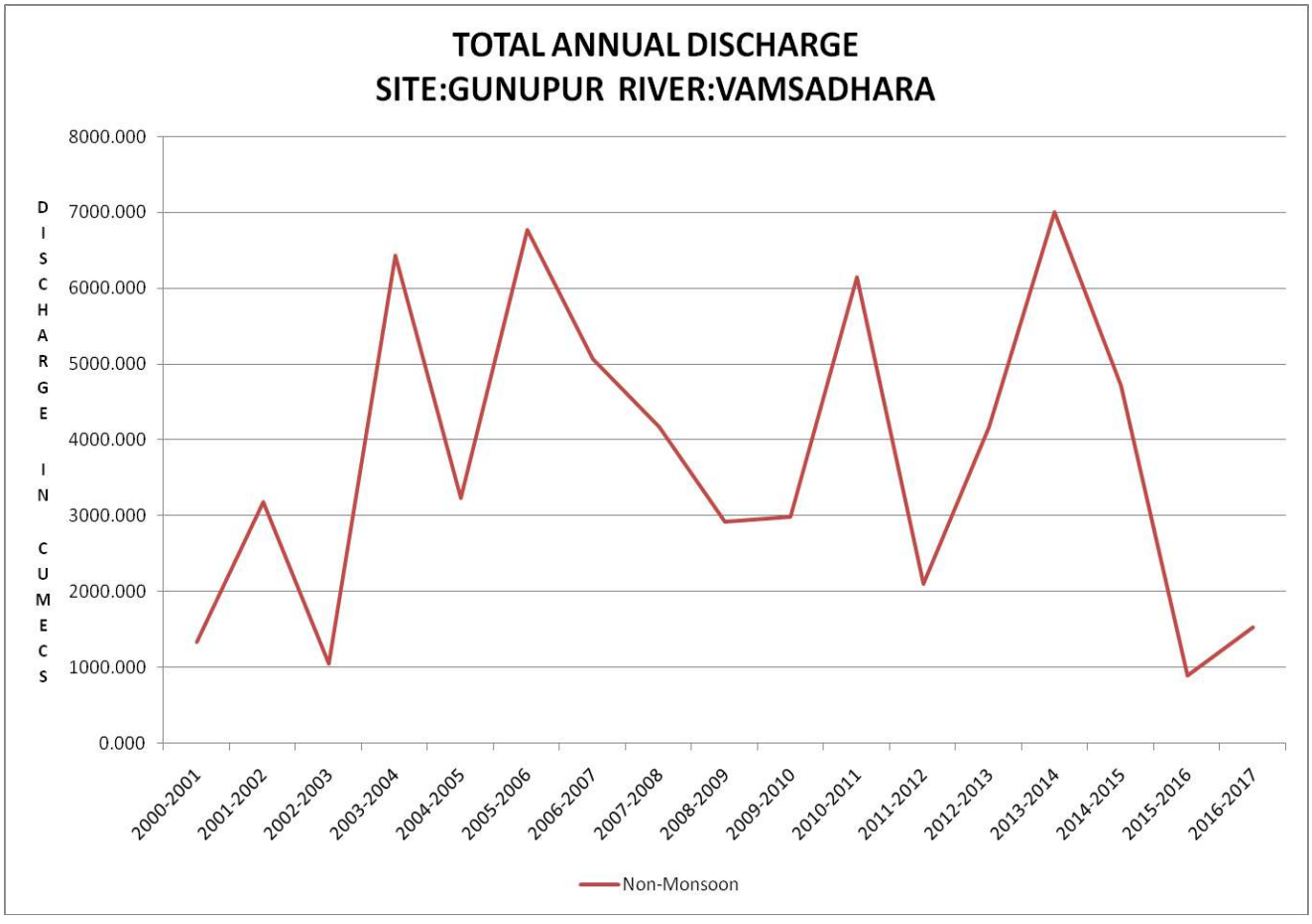
Water Quality Seasonal Average for the period: 2015-2017

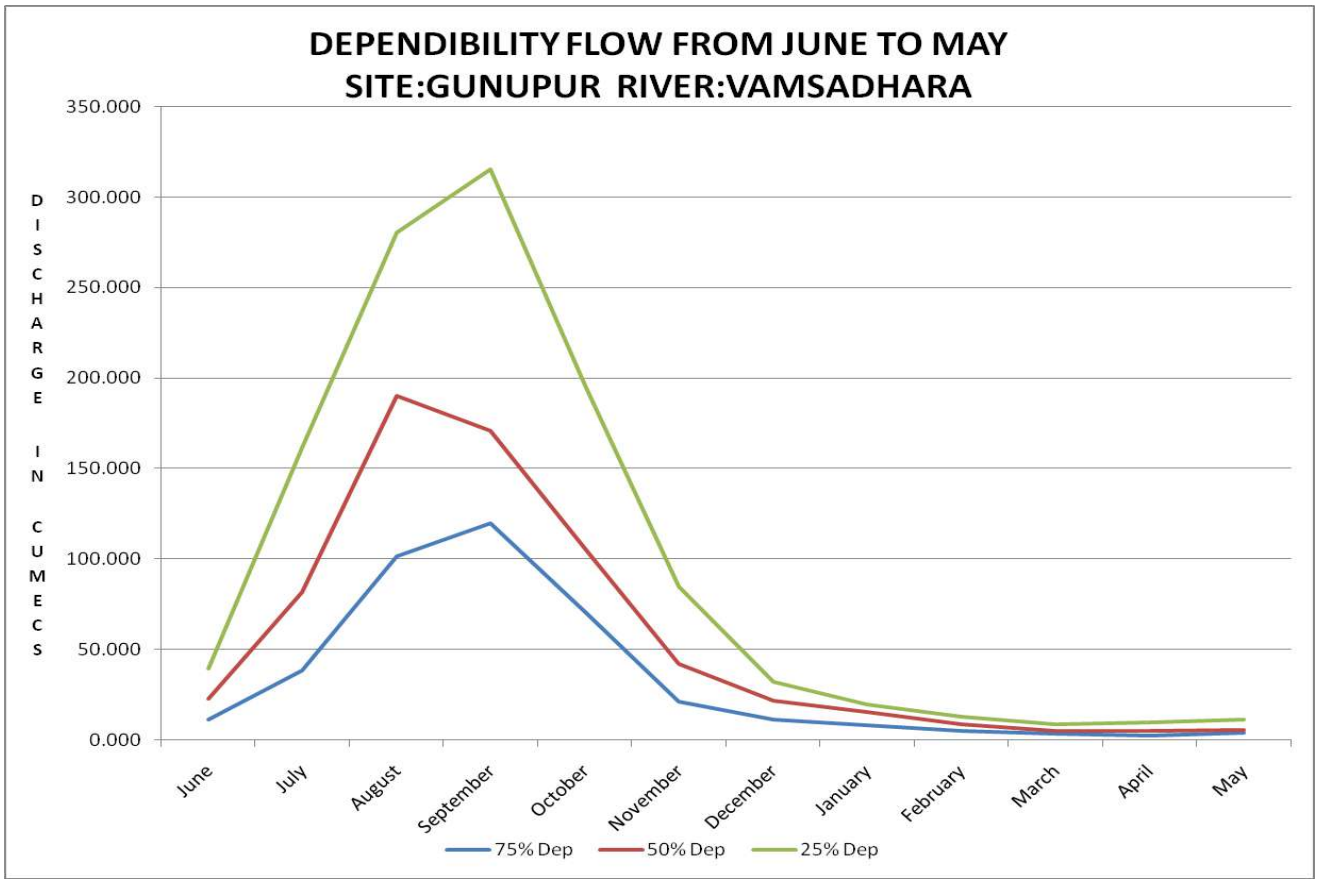
Station Name : GUNUPUR (AV000K9) **Division : E.E., Bhubaneswar**

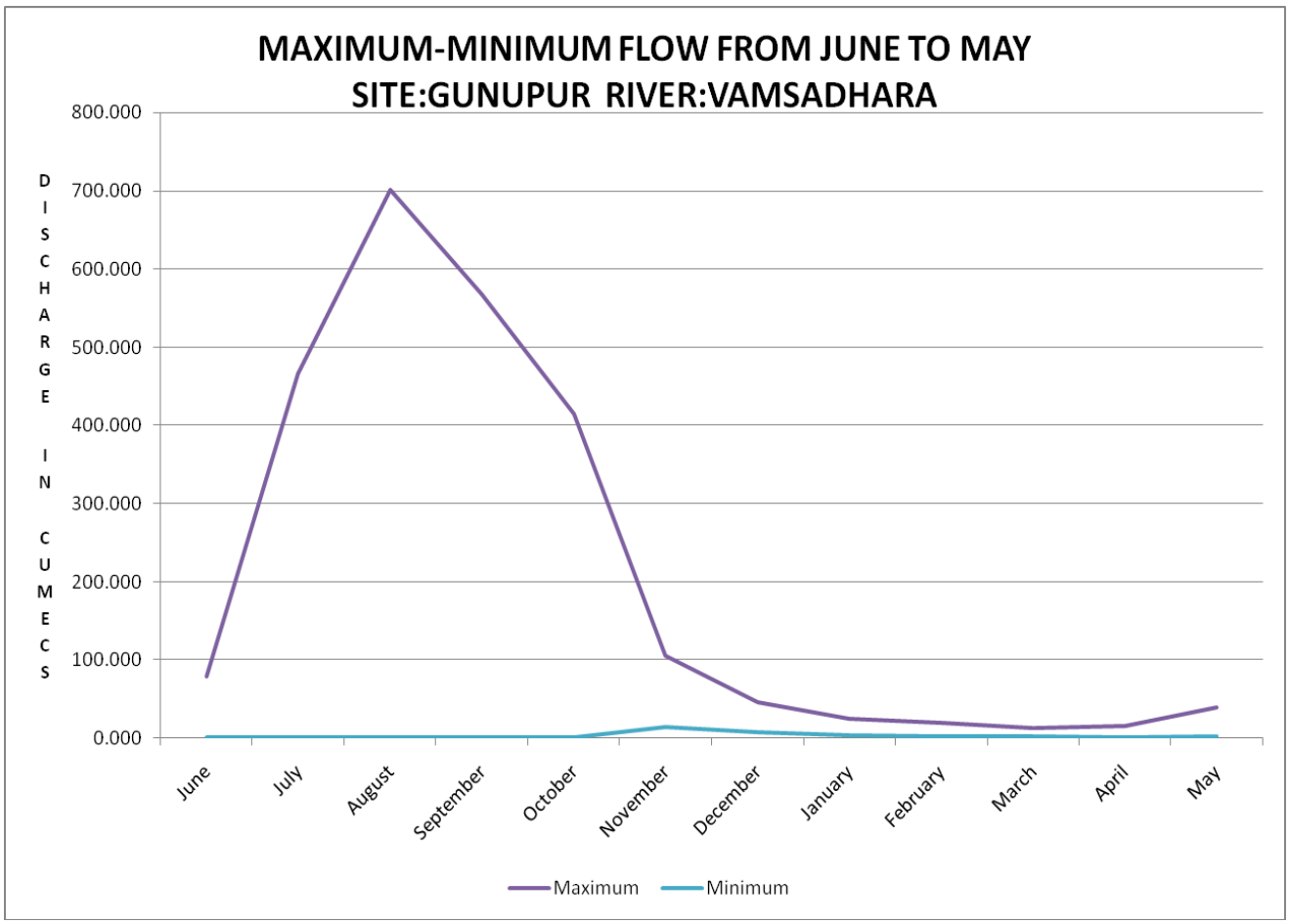
Local River : Vamsadhara **River Water** **Sub-Division : Behrampur**

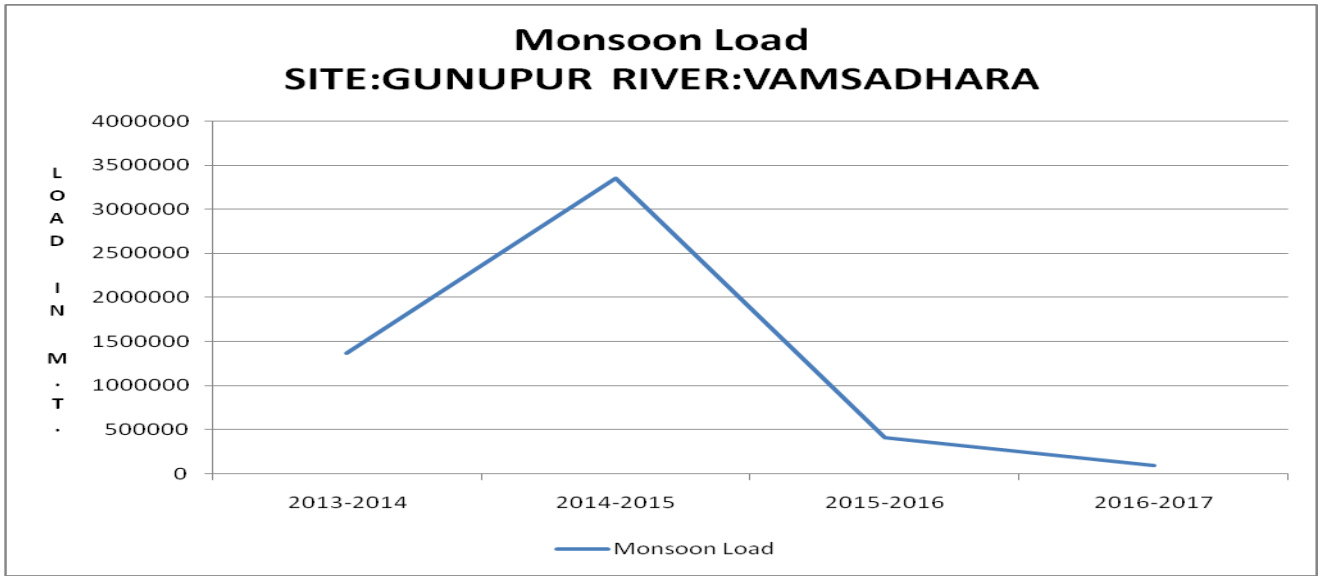
S.No	Parameters	Flood		Winter		Summer	
		Jun - Oct		Nov - Feb		Mar - May	
		2015	2016	2015-2016	2016-2017	2016	2017
	PHYSICAL						
1	Q (cumec)						
2	EC_FLD (µmho/cm)	358	179	397	433	710	654
3	EC_GEN (µmho/cm)	366	182	394	436	713	659
4	pH_FLD (pH units)	7.3	7.4	7.9	7.7	8.0	7.8
5	pH_GEN (pH units)	7.2	7.5	7.9	7.8	8.0	7.9
6	Temp (deg C)	27.2	28.0	18.5	25.5	22.5	23.0
	CHEMICAL						
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	4.6	0.0	18.4	0.0
2	ALK-TOT (mgCaCO3/L)	79	85	65	53	97	65
3	B (mg/L)	0.01	0.02	0.01	0.01	0.02	0.03
4	Ca (mg/L)	20	41	21	35	27	38
5	Cl (mg/L)	11.9	25.8	15.1	17.9	18.9	35.8
6	CO3 (mg/L)	0.0	0.0	5.5	0.0	22.2	0.0
7	F (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)	0.5	0.5	0.4	0.8	0.4	0.5
9	HCO3 (mg/L)	96	103	68	65	73	79
10	K (mg/L)	2.7	7.8	2.8	11.3	8.0	11.9
11	Mg (mg/L)	10.4	20.9	9.2	11.2	14.6	12.6
12	Na (mg/L)	10.4	22.1	21.5	58.2	17.0	90.1
13	NO2+NO3 (mg N/L)	0.92	1.00	1.04	1.16	0.98	0.99
14	NO2-N (mgN/L)	0.01	0.04	0.01	0.01	0.03	0.03
15	NO3-N (mgN/L)	0.90	0.96	1.04	1.15	0.95	0.97
16	P-Tot (mgP/L)	0.001	0.010	0.001	0.010	0.002	0.010
17	SiO2 (mg/L)	5.7	6.7	5.5	6.8	6.0	7.0
18	SO4 (mg/L)	13.2	7.7	7.0	15.8	7.7	16.0
	BIOLOGICAL/BACTERIOLOGICAL						
	TRACE & TOXIC						
	CHEMICAL INDICES						
1	HAR_Ca (mgCaCO3/L)	49	103	52	88	68	96
2	HAR_Total (mgCaCO3/L)	93	190	91	135	129	149
3	Na% (%)	18	19	33	41	21	55
4	SAR (-)	0.5	0.7	1.0	2.2	0.7	3.2
	PESTICIDES						

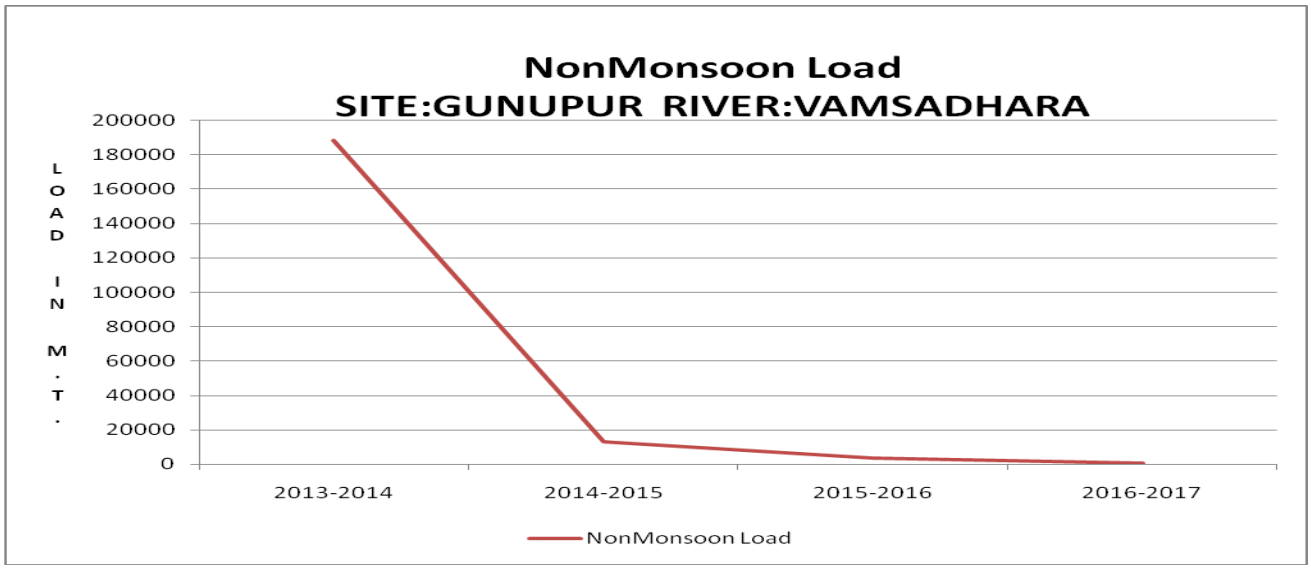

TOTAL ANNUAL DISCHARGE
SITE:GUNUPUR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
70000.000
60000.000
50000.000
40000.000
30000.000
20000.000
10000.000
0.000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon
Annual Runoff

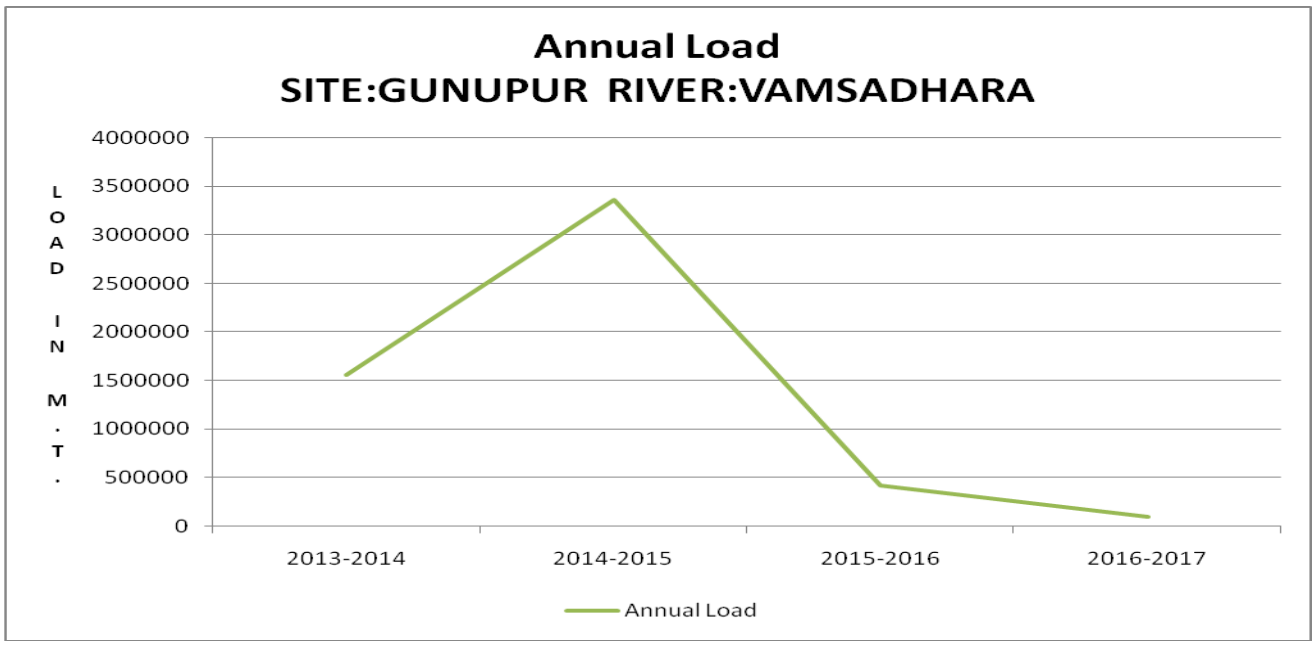

TOTAL ANNUAL DISCHARGE
SITE:GUNUPUR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
8000.000
7000.000
6000.000
5000.000
4000.000
3000.000
2000.000
1000.000
0.000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Non-Monsoon


DEPENDIBILITY FLOW FROM JUNE TO MAY
SITE:GUNUPUR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
350.000
300.000
250.000
200.000
150.000
100.000
50.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
75% Dep
50% Dep
25% Dep


MAXIMUM-MINIMUM FLOW FROM JUNE TO MAY
SITE:GUNUPUR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
Maximum
Minimum


Monsoon Load
SITE:GUNUPUR RIVER:VAMSADHARA
LOAD IN M.T.
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon Load


NonMonsoon Load
SITE:GUNUPUR RIVER:VAMSADHARA
LOAD IN M.T.
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
2013-2014
2014-2015
2015-2016
2016-2017
NonMonsoon Load


Annual Load
SITE:GUNUPUR RIVER:VAMSADHARA
LOAD IN M.T.
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
2013-2014
2014-2015
2015-2016
2016-2017
Annual Load

HISTORY SHEET

Water Year : 2016-2017

Site	:	**KASHINAGAR**	**Code**	:	**AV000J4**
State	:	Odisha	District		Gajapati
Basin	:	EFR B Mahanadi-Godavari	Independent River	:	Vamsadhara
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Vamsadhara
Division	:	E.E., Bhubaneswar	Sub-Division	:	Behrampur
Drainage Area	:	7820 Sq. Km.	Bank	:	Left
Latitude	:	18°50'49"	Longitude	:	83°57'04"
Zero of Gauge (m)	:	50 (m.s.l) 51 (m.s.l)	3/20/1971 6/1/1985	-	5/31/1985 12/31/2999
		Opening Date	Closing Date		
Gauge	:	3/20/1971			
Discharge	:	4/28/1971			
Sediment	:	10/13/1972			
Water Quality	:	9/1/1972			

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1971-1972	3348	55.565	9/5/1971	0.100	53.095	5/29/1972
1972-1973	6589	56.303	9/23/1972	0.100	53.080	6/8/1972
1973-1974	763.3	53.735	8/23/1973	0.300	51.760	4/21/1974
1974-1975	1081	54.160	6/17/1974	0.100	52.125	4/20/1975
1975-1976	867.1	53.985	6/27/1975	0.500	52.268	5/10/1976
1976-1977	1611	54.370	9/4/1976	0.400	51.835	4/6/1977
1977-1978	2148	54.770	9/12/1977	1.000	51.825	5/31/1978
1978-1979	1292	54.565	8/28/1978	0.400	52.150	4/13/1979
1979-1980	1158	54.415	8/8/1979	0.200	52.230	5/27/1980
1980-1981	1901	53.980	9/17/1980	2.000	52.415	6/1/1980
1981-1982	1160	54.500	8/9/1981	2.000	51.000	5/9/1982
1982-1983	2001	53.790	8/30/1982	0.865	51.450	5/6/1983
1983-1984	765.3	53.820	10/7/1983	0.261	51.570	5/25/1984
1984-1985	850.0	54.460	6/13/1984	0.016	51.510	5/6/1985
1985-1986	928.9	54.790	8/7/1985	0.520	52.595	6/1/1985
1986-1987	1006	54.985	7/22/1986	1.036	52.680	4/15/1987
1987-1988	327.3	54.340	10/17/1987	0.020	52.530	4/15/1988
1988-1989	1100	54.950	10/2/1988	0.040	52.660	4/12/1989
1989-1990	1499	55.755	5/11/1990	0.484	52.690	6/1/1989
1990-1991	3217	55.928	10/12/1990	5.000	53.325	5/22/1991

Q : Observed / Computed Discharge WL : Corresponding Water Level(m.s.l)

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1991-1992	3246	56.250	7/29/1991	2.450	53.015	4/25/1992
1992-1993	3078	56.190	7/28/1992	2.210	52.955	5/12/1993
1993-1994	294.5	54.620	8/20/1993	0.870	53.035	4/2/1994
1994-1995	2486	56.045	9/4/1994	2.130	53.100	6/3/1994
1995-1996	1640	55.595	8/31/1995	2.590	53.345	5/17/1996
1996-1997	529.0	55.140	8/23/1996	1.000	53.330	3/23/1997
1997-1998	2052	55.885	8/21/1997	0.380	53.230	6/11/1997
1998-1999	278.6	54.815	11/17/1998	0.065	53.495	4/24/1999
1999-2000	326.8	54.895	7/29/1999	2.233	53.495	4/18/2000
2000-2001	465.0	54.975	8/27/2000	0.568	53.480	5/5/2001
2001-2002	1235	55.685	7/7/2001	1.060	53.425	5/14/2002
2002-2003	457.3	55.060	8/29/2002	0.000	51.000	5/17/2003
2003-2004	4268	56.480	10/7/2003	0.000	51.000	6/10/2003
2004-2005	1040	55.535	8/11/2004	0.950	53.275	5/23/2005
2005-2006	1624	55.880	9/19/2005	1.531	53.300	6/18/2005
2006-2007	4062	56.560	7/3/2006	5.796	53.375	4/10/2007
2007-2008	7322	57.850	8/7/2007	4.731	53.040	5/22/2008
2008-2009	5399	56.955	9/18/2008	1.500	52.735	5/3/2009
2009-2010	1553	55.542	7/20/2009	1.344	52.885	4/23/2010
2010-2011	1563	55.545	8/5/2010	2.417	52.870	6/10/2010
2011-2012	1948	55.725	9/2/2011	1.118	53.115	4/8/2012
2012-2013	729.3	55.215	8/6/2012	0.862	53.215	6/16/2012
2013-2014	1999	55.688	10/25/2013	4.584	53.160	5/2/2014
2014-2015	4250	56.605	9/7/2014	7.600	53.505	5/31/2015
2015-2016	572.5	55.110	9/16/2015	0.700	53.220	5/1/2016
2016-2017	541.6	55.100	8/6/2016	0.826	53.060	4/29/2017

Q : Observed / Computed Discharge WL : Corresponding Water Level(m.s.l)

Stage-Discharge Data for the period 2016 - 2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	53.370	4.008	53.830	42.44	53.950	59.26	53.900	93.07	54.390	157.7	53.630	48.47
2	53.360	3.665	53.800	40.16	54.440	195.8	53.880	82.93	54.560	193.0 *	53.600	44.00
3	53.350	3.334	54.290	122.0 *	54.090	113.0	54.880	81.00	54.370	153.5	53.580	42.23
4	53.450	8.601	53.950	65.21	53.960	74.92	54.240	132.6 *	54.310	139.8	53.560	43.20
5	53.410	6.307 *	53.710	45.04	54.300	135.6	54.180	126.9	54.290	134.4	53.550	42.67
6	53.410	6.182	53.760	48.96	55.100	541.6	54.450	239.2	54.160	116.2	53.550	43.00 *
7	53.410	6.279	53.720	44.00 *	54.480	210.0 *	54.250	140.3	54.220	128.5	53.570	50.06
8	53.500	11.80	53.690	41.14	54.430	193.0	54.110	95.35	54.400	165.0	53.550	47.70
9	53.480	9.137	53.680	39.78	54.150	139.0	54.030	77.95	54.490	183.0 *	53.480	44.71
10	53.500	11.19	53.800	48.00 *	54.080	132.3	53.980	61.56	54.540	193.0 *	53.480	41.54
11	53.600	16.48	53.980	60.87	53.920	119.0	54.070	83.77 *	54.530	191.0 *	53.460	40.12
12	53.540	13.00 *	54.070	75.42	53.900	117.3	54.360	156.3	54.490	183.0 *	53.450	39.15
13	53.480	10.36	53.950	65.12	54.170	148.9	54.180	100.9 *	54.310	140.5	53.450	39.00 *
14	53.440	8.247	53.840	52.71	53.950	100.0 *	54.160	95.47	54.190	134.8	53.450	39.00 *
15	53.420	7.625	53.750	43.72	53.990	109.0 *	54.290	123.6	54.120	127.6	53.440	36.53
16	53.400	6.831	53.720	39.95	53.940	97.80	54.280	119.0	54.050	123.0 *	53.440	36.20
17	53.410	7.180	53.750	44.00 *	53.900	87.66	54.230	109.4	53.930	117.0	53.430	35.01
18	53.520	12.74	53.710	38.89	53.900	88.12	54.140	81.06 *	53.870	107.8	53.430	34.85
19			53.710	33.55	53.880	78.38	54.070	81.07	53.850	101.9	53.430	34.46
20	53.570	15.09	53.870	60.76	53.830	70.70	54.320	128.4	53.820	96.38	53.420	32.00 *
21	53.500	11.51	53.760	41.89	53.790	63.00 *	54.150	94.26	53.780	92.45	53.410	30.73
22	53.450	8.238	54.300	158.6	53.710	41.59	54.060	77.31	53.750	87.81	53.410	30.02
23	53.430	7.790	54.000	75.04	53.670	34.36	54.090	79.62	53.730	75.00 *	53.410	29.50
24	53.410	6.944	54.020	84.00 *	53.940	95.60	54.330	142.9	53.730	72.77	53.410	29.17
25	53.440	8.068	53.970	61.57	53.870	81.43	54.380	161.0 *	53.720	67.17	53.410	29.19
26			53.970	61.24	53.870	78.39	54.310	138.9	53.710	63.79	53.410	29.00
27	53.660	23.55	53.890	50.37	53.930	94.65	54.220	110.2	53.690	61.66	53.400	28.00 *
28	54.000	50.82	53.920	54.04	54.130	150.0 *	54.210	107.7	53.660	59.37	53.400	28.27
29	53.790	40.35	53.930	55.78	54.080	139.0	54.140	93.34	53.660	58.72	53.400	28.62
30	53.670	23.86	53.850	49.00	53.990	114.4	54.200	113.1	53.650	56.00 *	53.390	27.45
31			53.960	60.00 *	53.920	100.9			53.630	49.30		
Ten-Daily Mean												
I Ten-Daily	53.424	7.050	53.823	53.67	54.298	179.4	54.190	113.1	54.373	156.4	53.555	44.76
II Ten-Daily	53.487	10.84	53.835	51.50	53.938	101.7	54.210	107.9	54.116	132.3	53.440	36.63
III Ten-Daily	53.594	20.13	53.961	68.32	53.900	90.30	54.209	111.8	53.701	67.64	53.405	29.00
Monthly												
Min.	53.350	3.334	53.680	33.55	53.670	34.36	53.880	61.56	53.630	49.30	53.390	27.45
Max.	54.000	50.82	54.300	158.6	55.100	541.6	54.880	239.2	54.560	193.0	53.630	50.06
Mean	53.499	12.47	53.876	58.17	54.041	122.7	54.203	110.9	54.052	117.1	53.467	36.8

Annual Runoff in MCM = 1318 Annual Runoff in mm = 168

Peak Observed Discharge = 541.6 cumecs on 06/08/2016 Corres. Water Level :55.1 m

Lowest Observed Discharge = 0.826 cumecs on 29/04/2017 Corres. Water Level :53.06 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	53.390	27.05	53.270	10.00 *	53.190	6.441	53.140	2.239	53.130	2.066	53.170	3.285
2	53.390	26.59	53.270	10.42	53.190	6.391	53.140	2.287	53.130	2.000 *	53.240	8.713
3	53.390	26.98	53.270	10.08	53.180	5.803	53.130	2.144	53.130	1.985	53.190	4.615
4	53.380	25.50 *	53.270	10.08	53.180	5.843	53.130	2.159	53.120	1.857	53.160	3.424
5	53.370	24.06	53.260	9.635	53.180	5.500 *	53.130	2.000 *	53.120	1.914	53.150	2.931
6	53.360	22.25	53.260	9.722	53.180	5.128	53.130	1.929	53.120	1.852	53.140	2.628
7	53.360	21.57	53.260	10.08	53.170	5.049	53.130	1.928	53.110	1.507	53.200	
8	53.360	21.09	53.260	10.00 *	53.170	4.990	53.130	1.784	53.110	1.469	53.210	5.488
9	53.360	20.90	53.250	8.850	53.170	5.129	53.120	1.768	53.110	1.400 *	53.320	12.87
10	53.350	19.02	53.240	8.967	53.170	4.798	53.120	1.862	53.100	1.359	53.300	
11	53.350	19.00 *	53.240	8.771	53.170	4.857	53.170	2.856	53.100	1.415	53.270	10.60
12	53.350	19.00 *	53.240	8.599	53.170	4.700 *	53.420	32.00 *	53.100	1.382	53.240	7.155
13	53.330	14.45	53.230	8.179	53.170	4.613	53.410	29.00 *	53.100	1.350	53.220	5.391
14	53.330	14.01	53.230	8.257	53.170	4.619	53.320	16.42	53.090	1.300 *	53.210	
15	53.330	14.05	53.230	8.000 *	53.160	4.244	53.290	12.89	53.090	1.238	53.200	4.208
16	53.330	14.81	53.230	8.180	53.160	4.173	53.240	9.176	53.090	1.250 *	53.200	3.950
17	53.320	13.88	53.220	7.878	53.160	4.259	53.220	7.673	53.080	1.203	53.190	3.543
18	53.320	13.75 *	53.220	7.610	53.160	4.085	53.210	6.564	53.080	1.147	53.180	3.132
19	53.310	13.62	53.220	7.483	53.160	4.000 *	53.180	6.000 *	53.070	1.084	53.180	3.096
20	53.310	13.67	53.220	7.740	53.150	3.452	53.180	4.556	53.070	1.059	53.170	2.674
21	53.300	12.31	53.220	7.510	53.150	3.422	53.170	4.394	53.070	1.004	53.160	
22	53.300	12.18	53.220	7.748 *	53.150	3.022	53.170	3.891	53.070	1.043	53.150	1.774
23	53.290	11.81	53.210	7.344	53.150	3.020	53.160	3.358	53.070	1.000 *	53.150	1.758
24	53.280	10.81	53.210	7.171	53.140	3.000 *	53.160	3.322	53.070	1.039	53.160	2.085
25	53.280	11.00 *	53.210	7.150	53.140	2.898	53.160	3.215	53.070	1.023	53.190	3.644
26	53.270	10.27	53.210	7.000 *	53.140	3.000 *	53.150	2.760 *	53.060	0.909	53.210	4.714
27	53.270	10.95	53.200		53.140	2.642	53.140	2.294	53.060	0.889	53.220	4.933
28	53.270	10.93	53.200	6.661	53.140	2.712	53.140	2.303	53.060	0.886	53.350	
29	53.270	10.76	53.200	7.000 *			53.140	2.234	53.060	0.826	53.270	9.188
30	53.270	10.46	53.190	6.520			53.130	2.033	53.140	2.618 *	53.250	7.776
31	53.270	10.41	53.190	6.460			53.130	2.036			53.240	7.290
Ten-Daily Mean												
I Ten-Daily	53.371	23.50	53.261	9.783	53.178	5.507	53.130	2.010	53.118	1.741	53.208	5.494
II Ten-Daily	53.328	15.02	53.228	8.070	53.163	4.300	53.264	12.71	53.087	1.243	53.206	4.861
III Ten-Daily	53.279	11.08	53.205	7.056	53.144	2.965	53.150	2.894	53.073	1.124	53.214	4.796
Monthly												
Min.	53.270	10.27	53.190	6.460	53.140	2.642	53.120	1.768	53.060	0.826	53.140	1.758
Max.	53.390	27.05	53.270	10.42	53.190	6.441	53.420	32.00	53.140	2.618	53.350	12.87
Mean	53.325	16.36	53.231	8.303	53.163	4.35	53.180	5.776	53.093	1.369	53.209	5.033

Peak Computed Discharge = 210.0 cumecs on 07/08/2016 Corres. Water Level :54.48 m

Lowest Computed Discharge = 1.000 cumecs on 23/04/2017 Corres. Water Level :53.07 m

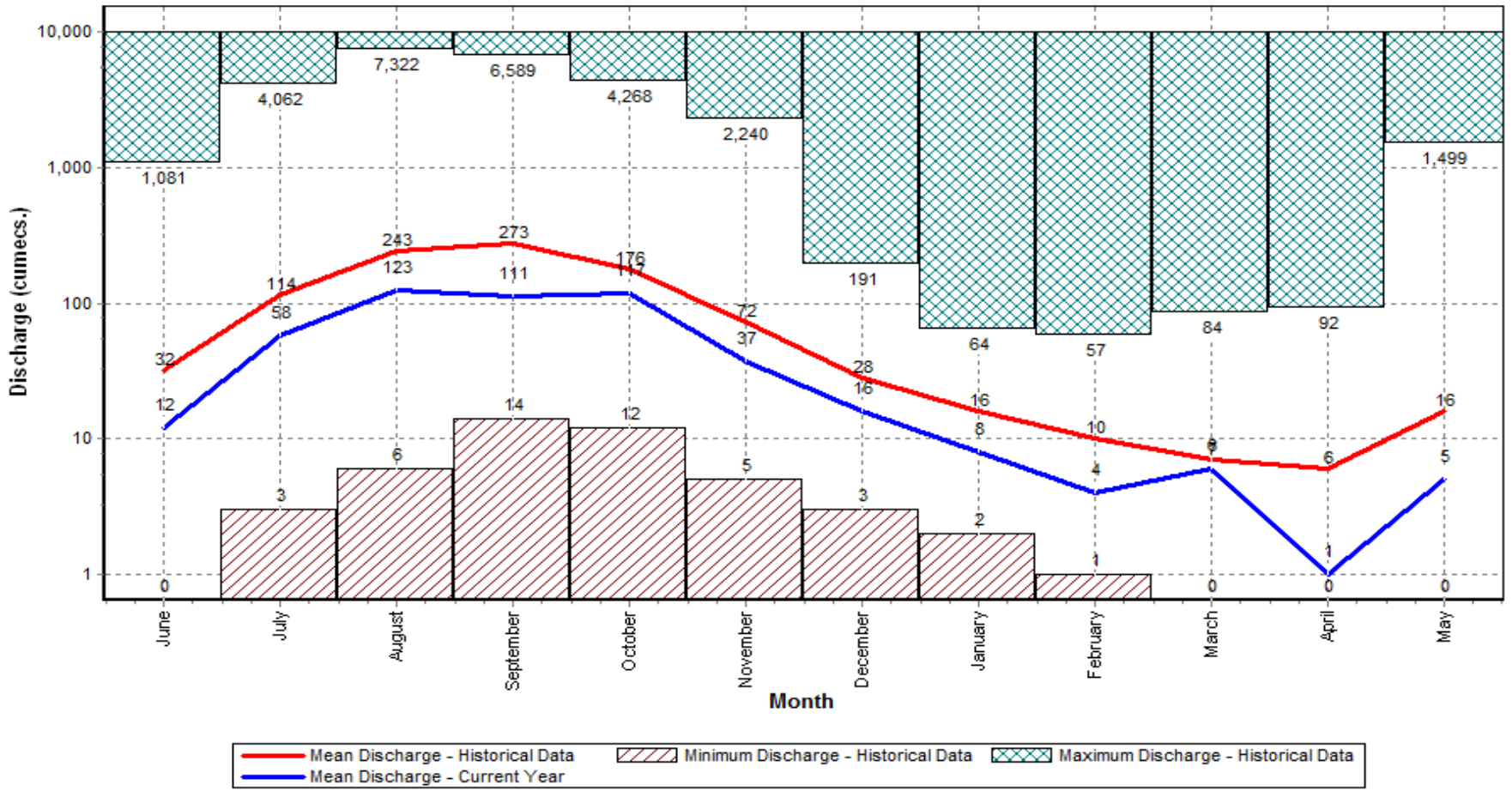
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

HISTOGRAM - HYDROGRAPH for Water Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Data considered : 1971-2017** **Division : E.E., Bhubaneswar**

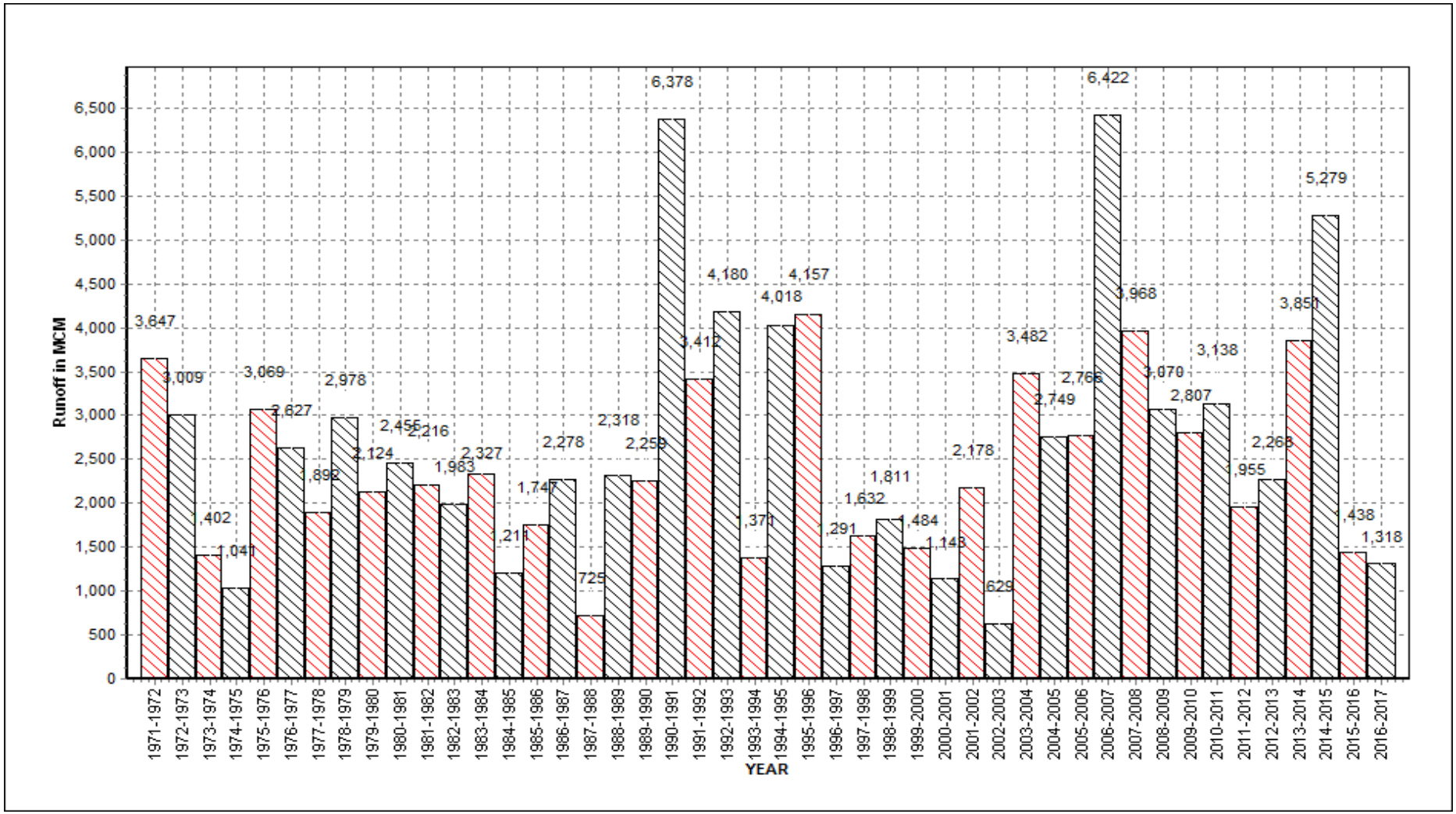
Local River : Vamsadhara **Sub-Division : Behrampur**



Annual Runoff Values for the period: 1971 - 2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

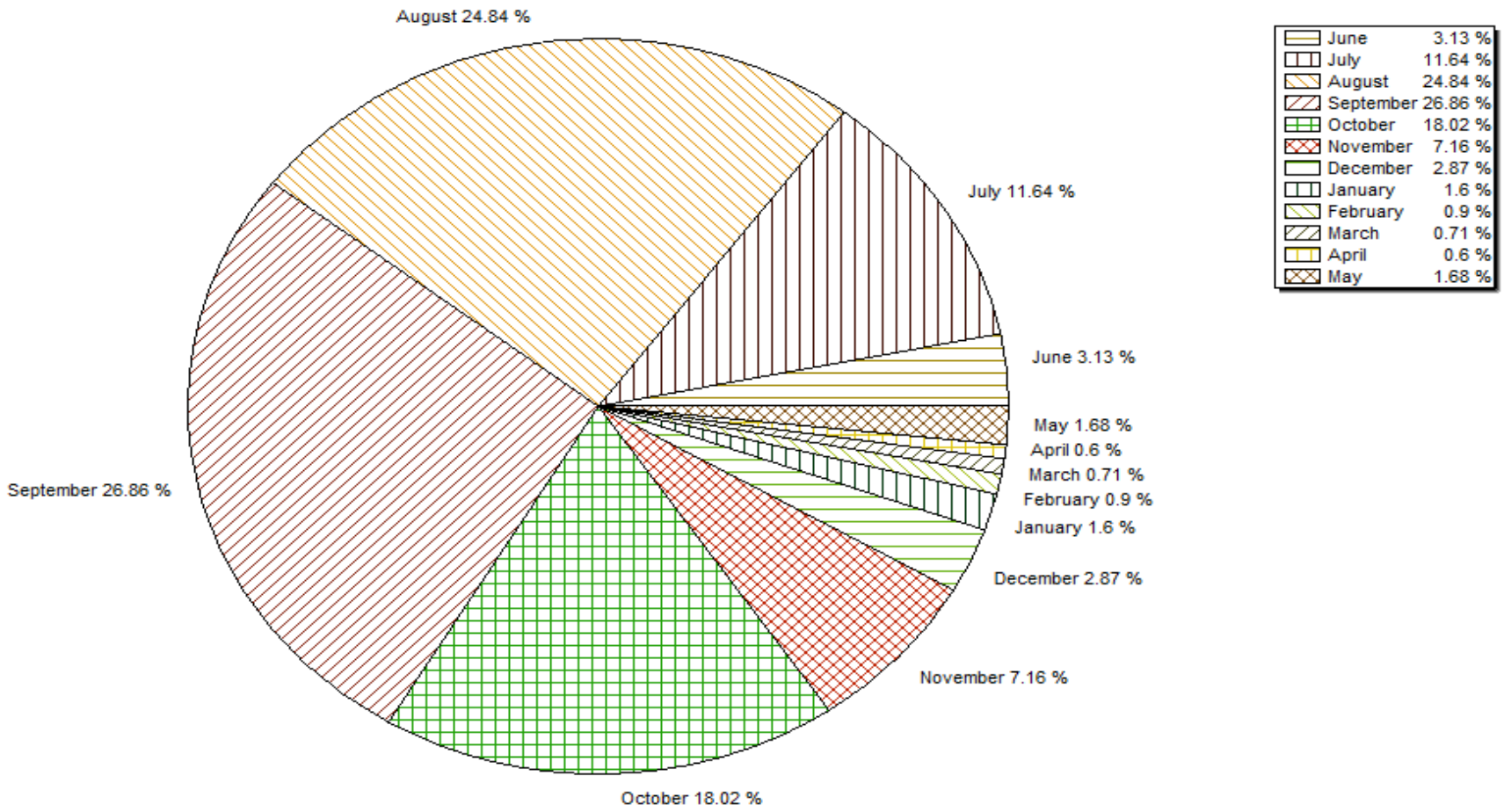


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period : 1971-2016

Station Name : KASHINAGAR (AV000J4)
Local River : Vamsadhara

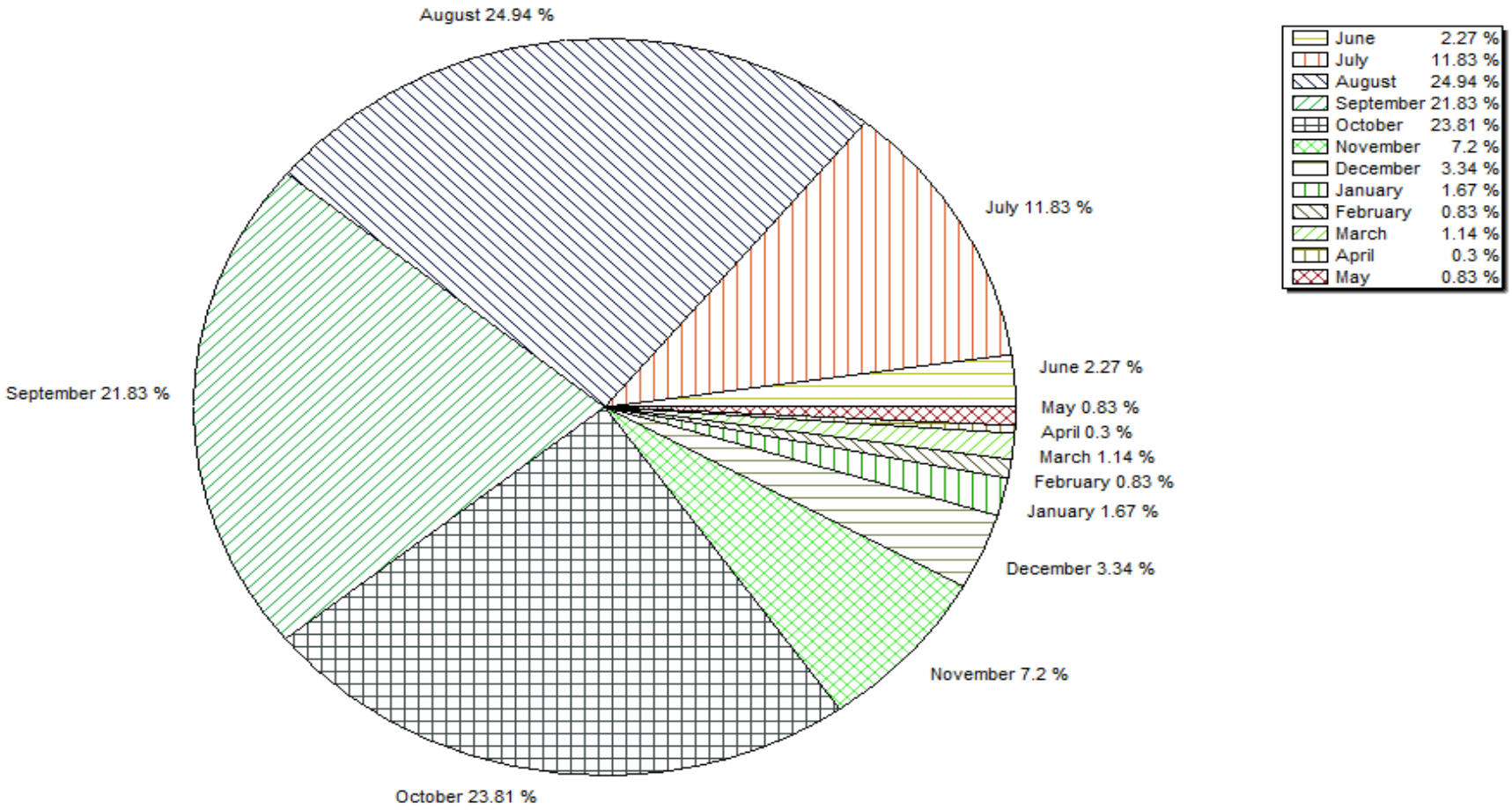
Division : E.E., Bhubaneswar
Sub-Division : Behrampur



Monthly Runoff for the Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

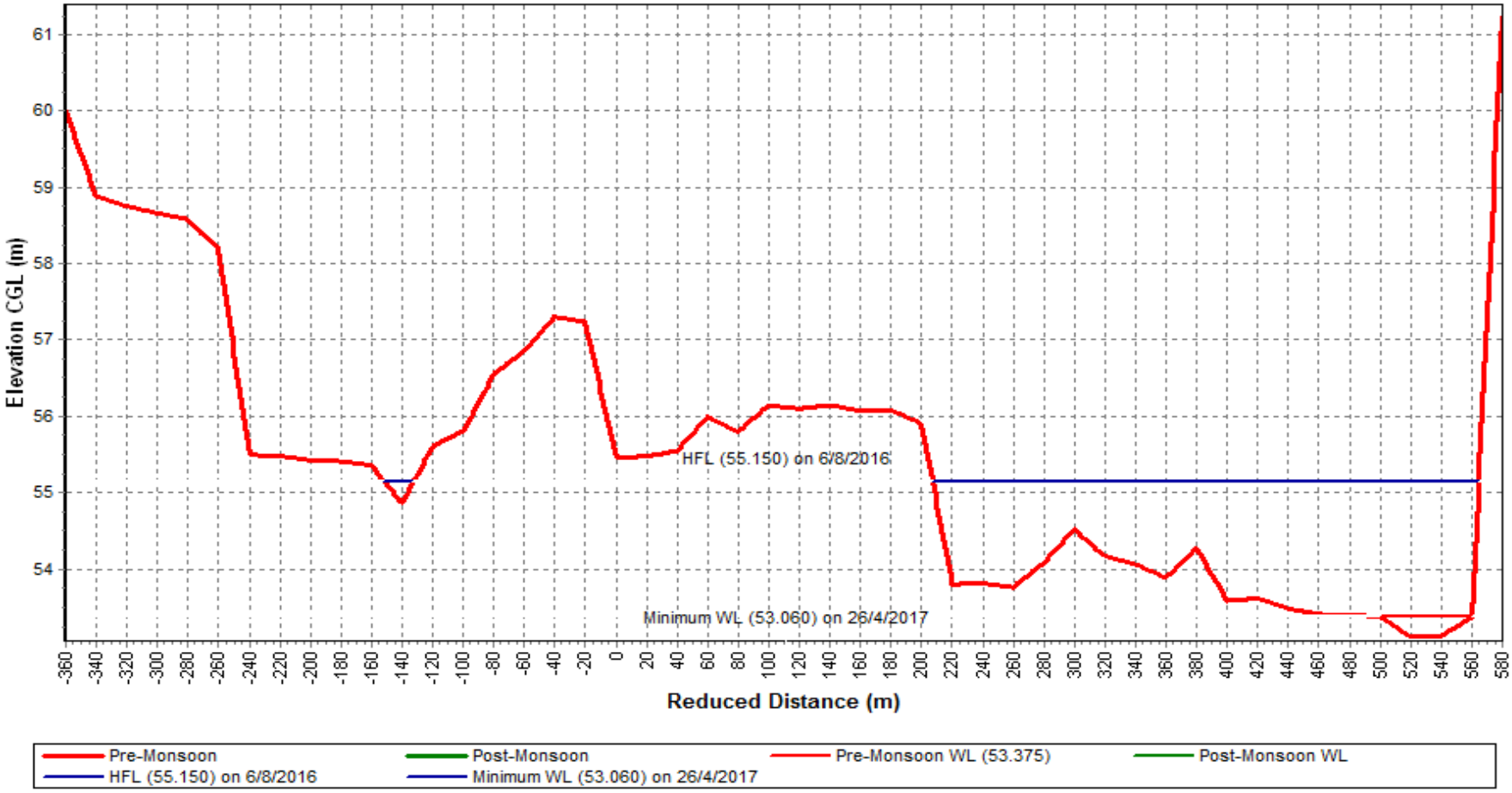
Local River : Vamsadhara **Sub-Division : Behrampur**



Pre-Monsoon & Post-Monsoon X-Section for Water Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

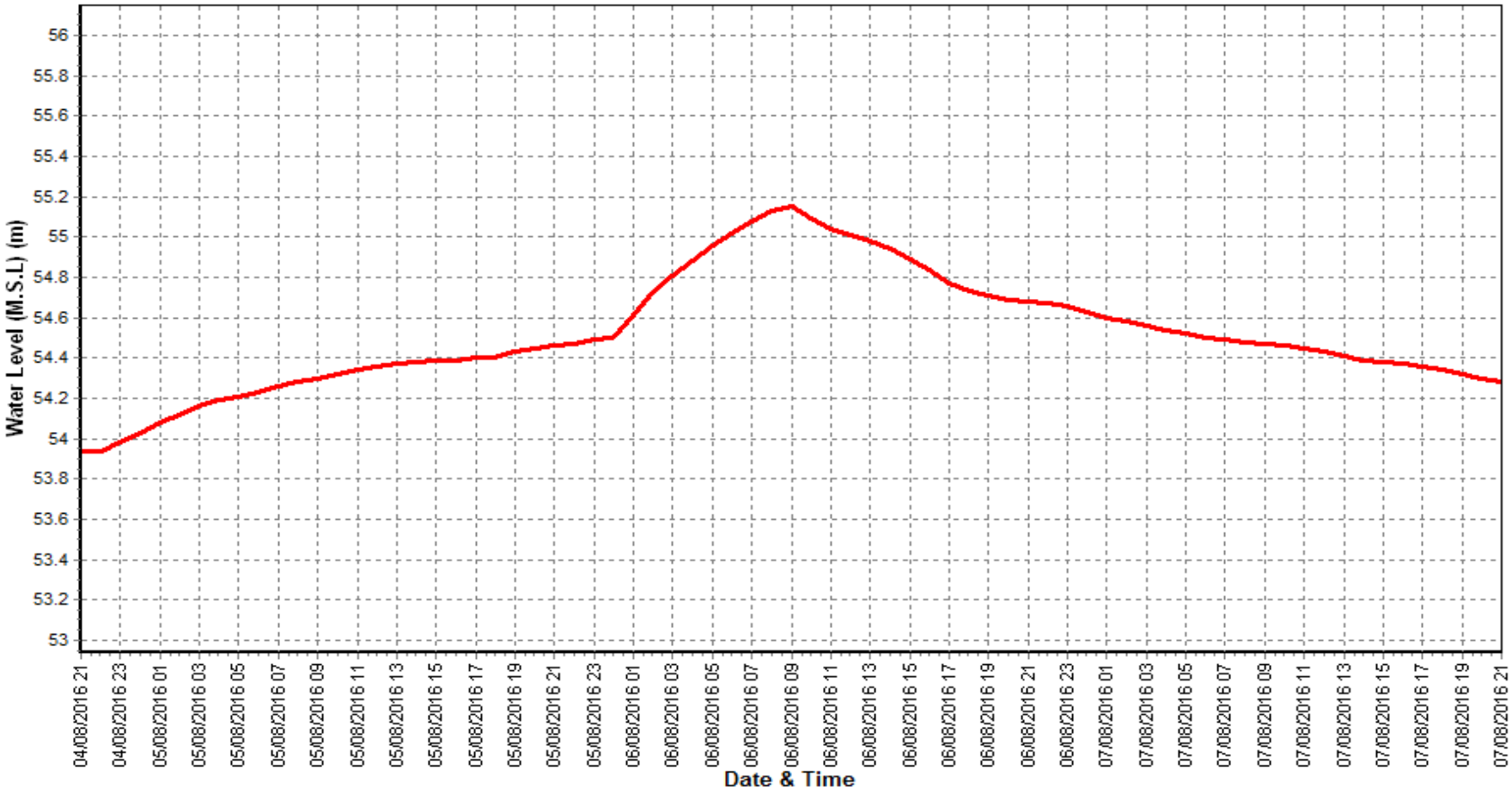
Local River : Vamsadhara **Sub-Division : Behrampur**



Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

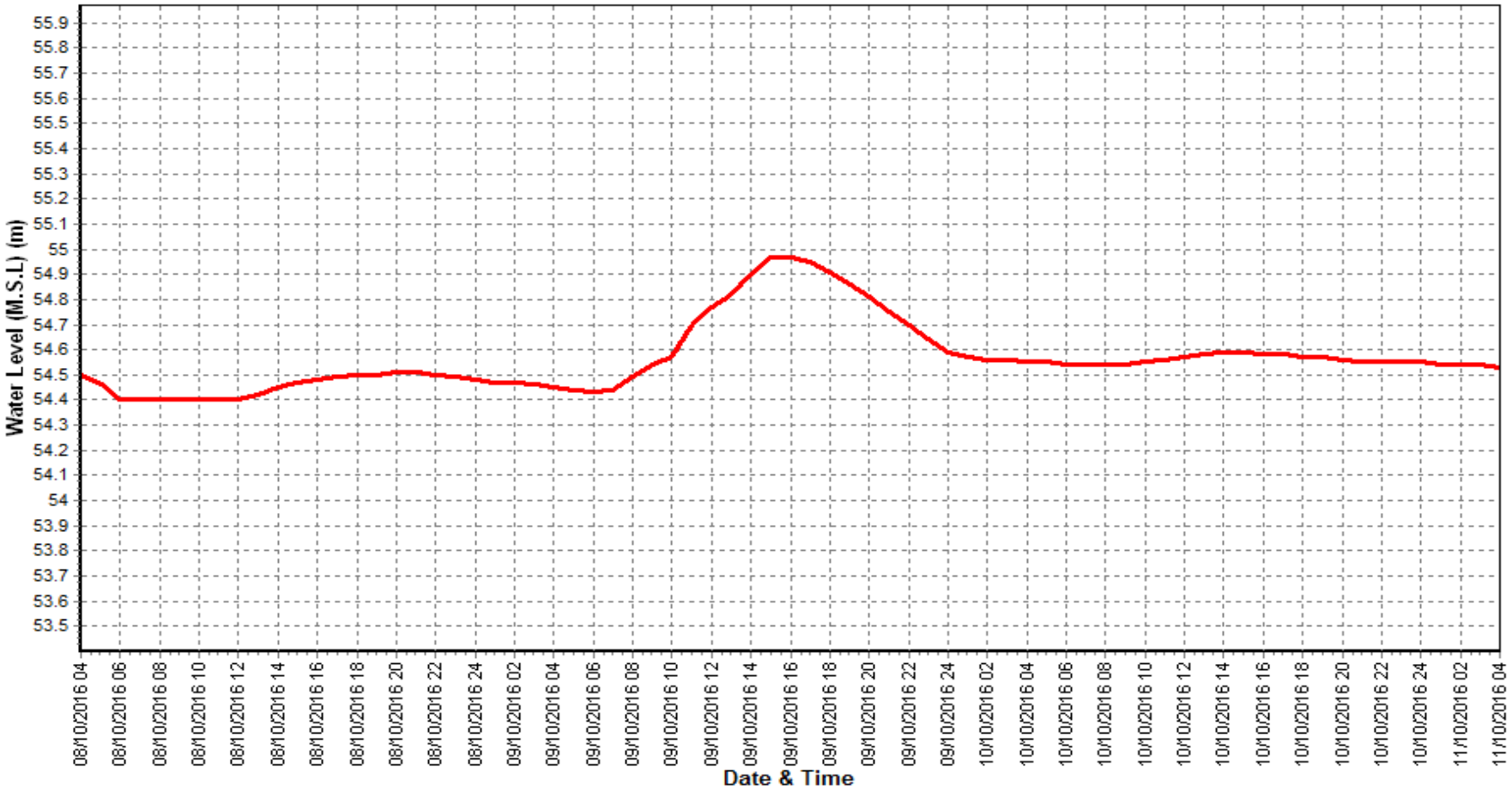


Time Span: 72 Hrs

Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

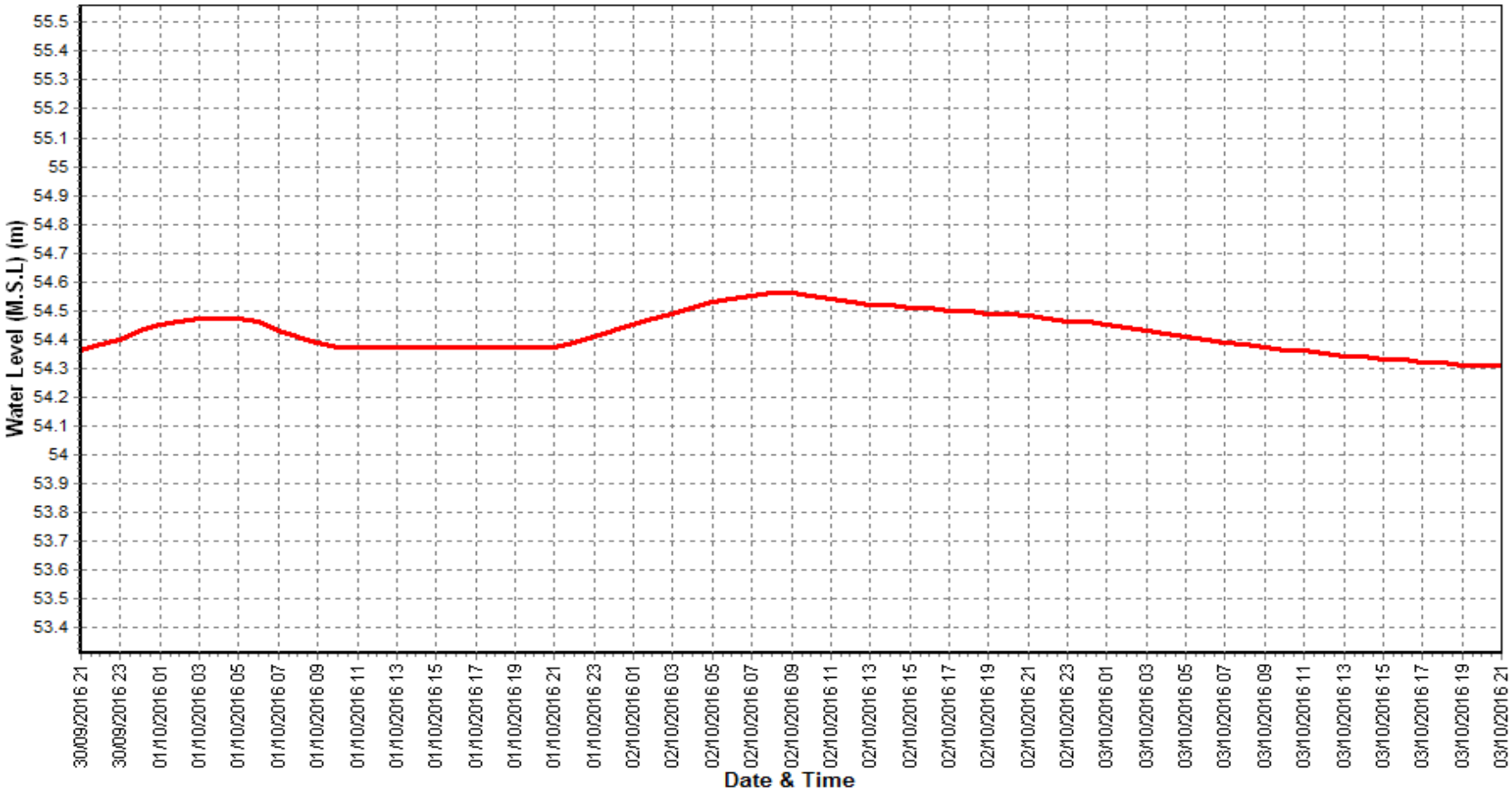


Time Span: 72 Hrs

Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**



Time Span: 72 Hrs

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Jun						Jul						Aug					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	4.008	0.000	0.000	0.201	0.201	70	42.44	0.000	0.000	0.541	0.541	1983	59.26	0.000	0.000	0.767	0.767	3928
2	3.665	0.000	0.000	0.225	0.225	71	40.16	0.000	0.000	0.514	0.514	1784	195.8	0.023	0.035	1.615	1.673	28291
3	3.334	0.000	0.000	0.228	0.228	66	122.0	0.000	0.000	1.562	1.562	16459	113.0	0.139	0.021	0.918	1.078	10525
4	8.601	0.000	0.000	0.235	0.235	174	65.21	0.000	0.000	1.156	1.156	6514	74.92	0.000	0.000	0.616	0.616	3984
5	6.307	0.000	0.000	0.192	0.192	105	45.04	0.000	0.000	0.436	0.436	1697	135.6	0.015	0.265	0.863	1.143	13390
6	6.182	0.000	0.000	0.219	0.219	117	48.96	0.000	0.000	0.285	0.285	1206	541.6	0.042	0.045	0.867	0.953	44617
7	6.279	0.000	0.000	0.241	0.241	131	44.00	0.000	0.000	0.256	0.256	974	210.0	0.016	0.018	0.341	0.375	6808
8	11.80	0.000	0.000	0.239	0.239	243	41.14	0.000	0.000	0.145	0.145	516	193.0	0.008	0.014	0.377	0.399	6652
9	9.137	0.000	0.000	0.213	0.213	168	39.78	0.000	0.000	0.389	0.389	1336	139.0	0.023	0.042	0.417	0.481	5779
10	11.19	0.000	0.000	0.227	0.227	220	48.00	0.000	0.000	0.469	0.469	1945	132.3	0.020	0.036	0.309	0.366	4180
11	16.48	0.000	0.000	0.305	0.305	434	60.87	0.000	0.000	0.440	0.440	2314	119.0	0.017	0.031	0.353	0.401	4120
12	13.00	0.000	0.000	0.240	0.240	270	75.42	0.000	0.000	0.504	0.504	3283	117.3	0.015	0.022	0.274	0.310	3143
13	10.36	0.000	0.000	0.219	0.219	196	65.12	0.000	0.000	0.249	0.249	1402	148.9	0.022	0.040	0.254	0.316	4068
14	8.247	0.000	0.000	0.203	0.203	145	52.71	0.000	0.000	0.215	0.215	977	100.0	0.015	0.027	0.171	0.212	1833
15	7.625	0.000	0.000	0.199	0.199	131	43.72	0.000	0.000	0.162	0.162	613	109.0	0.016	0.029	0.186	0.231	2177
16	6.831	0.000	0.000	0.198	0.198	117	39.95	0.000	0.000	0.148	0.148	511	97.80	0.018	0.035	0.070	0.123	1038
17	7.180	0.000	0.000	0.197	0.197	122	44.00	0.000	0.000	0.162	0.162	617	87.66	0.017	0.033	0.072	0.122	920
18	12.74	0.000	0.000	0.239	0.239	264	38.89	0.000	0.000	0.220	0.220	738	88.12	0.017	0.034	0.043	0.094	716
19		0.000	0.000	0.300	0.300		33.55	0.000	0.000	0.268	0.268	777	78.38	0.022	0.045	0.029	0.096	649
20	15.09	0.000	0.000	0.295	0.295	385	60.76	0.000	0.000	0.922	0.922	4839	70.70	0.024	0.043	0.067	0.134	819
21	11.51	0.000	0.000	0.233	0.233	231	41.89	0.000	0.000	0.522	0.522	1889	63.00	0.021	0.038	0.060	0.120	650
22	8.238	0.000	0.000	0.070	0.070	50	158.6	0.000	0.000	1.713	1.713	23474	41.59	0.029	0.055	0.124	0.209	750
23	7.790	0.000	0.000	0.064	0.064	43	75.04	0.000	0.000	0.921	0.921	5971	34.36	0.027	0.053	0.068	0.148	438
24	6.944	0.000	0.000	0.045	0.045	27	84.00	0.000	0.000	1.029	1.029	7470	95.60	0.021	0.042	0.257	0.320	2639
25	8.068	0.000	0.000	0.057	0.057	40	61.57	0.000	0.000	0.619	0.619	3294	81.43	0.019	0.039	0.373	0.430	3027
26		0.000	0.000	0.142	0.142		61.24	0.000	0.000	0.802	0.802	4243	78.39	0.018	0.038	0.527	0.582	3944
27	23.55	0.000	0.000	1.071	1.071	2178	50.37	0.000	0.000	0.555	0.555	2415	94.65	0.022	0.045	0.197	0.264	2156
28	50.82	0.000	0.000	0.524	0.524	2299	54.04	0.000	0.000	0.671	0.671	3134	150.0	0.035	0.071	0.312	0.418	5416
29	40.35	0.000	0.000	0.790	0.790	2755	55.78	0.000	0.000	0.772	0.772	3719	139.0	0.034	0.067	0.307	0.407	4892
30	23.86	0.000	0.000	0.654	0.654	1348	49.00	0.000	0.000	0.741	0.741	3136	114.4	0.030	0.055	0.106	0.191	1889
31							60.00	0.000	0.000	0.907	0.907	4701	100.9	0.027	0.049	0.091	0.167	1452
Ten Daily Mean																		
Ten Daily I	7.050	0.000	0.000	0.222	0.222	136	53.67	0.000	0.000	0.575	0.575	3441	179.4	0.029	0.048	0.709	0.785	12815
Ten Daily II	10.84	0.000	0.000	0.239	0.239	229	51.50	0.000	0.000	0.329	0.329	1607	101.7	0.018	0.034	0.152	0.204	1948
Ten Daily III	20.13	0.000	0.000	0.365	0.365	997	68.32	0.000	0.000	0.841	0.841	5768	90.30	0.026	0.050	0.220	0.296	2478
Monthly Total						12398						113933						174891

Annual Sediment Load (Metric Tonnes) : 520582

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Sep						Oct						Nov					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	93.07	0.024	0.045	0.347	0.416	3342	157.7	0.012	0.023	0.545	0.580	7897	48.47	0.000	0.000	0.007	0.007	27
2	82.93	0.000	0.000	0.189	0.189	1351	193.0	0.015	0.028	0.667	0.710	11831	44.00	0.000	0.000	0.007	0.007	25
3	81.00	0.000	0.000	0.153	0.153	1073	153.5	0.011	0.022	0.379	0.412	5467	42.23	0.000	0.000	0.006	0.006	22
4	132.6	0.035	0.064	0.252	0.351	4021	139.8	0.010	0.020	0.340	0.370	4466	43.20	0.000	0.000	0.006	0.006	23
5	126.9	0.028	0.044	0.572	0.644	7059	134.4	0.010	0.019	0.256	0.284	3299	42.67	0.000	0.000	0.006	0.006	22
6	239.2	0.053	0.080	0.618	0.751	15520	116.2	0.007	0.014	0.163	0.183	1839	43.00	0.000	0.000	0.006	0.006	22
7	140.3	0.032	0.049	0.353	0.433	5255	128.5	0.008	0.016	0.182	0.206	2284	50.06	0.000	0.000	0.007	0.007	28
8	95.35	0.013	0.020	0.253	0.286	2360	165.0	0.010	0.020	0.641	0.671	9568	47.70	0.000	0.000	0.006	0.006	26
9	77.95	0.000	0.000	0.122	0.122	821	183.0	0.011	0.022	0.711	0.745	11779	44.71	0.000	0.000	0.006	0.006	22
10	61.56	0.000	0.000	0.086	0.086	456	193.0	0.012	0.024	0.750	0.786	13100	41.54	0.000	0.000	0.005	0.005	18
11	83.77	0.000	0.000	0.118	0.118	850	191.0	0.012	0.023	0.743	0.778	12832	40.12	0.000	0.000	0.005	0.005	17
12	156.3	0.018	0.032	0.520	0.570	7695	183.0	0.011	0.022	0.711	0.745	11779	39.15	0.000	0.000	0.005	0.005	16
13	100.9	0.012	0.024	0.336	0.371	3238	140.5	0.008	0.017	0.209	0.234	2840	39.00	0.000	0.000	0.005	0.005	16
14	95.47	0.000	0.000	0.464	0.464	3826	134.8	0.007	0.016	0.144	0.167	1940	39.00	0.000	0.000	0.005	0.005	16
15	123.6	0.013	0.027	0.519	0.560	5975	127.6	0.007	0.014	0.111	0.132	1455	36.53	0.000	0.000	0.004	0.004	13
16	119.0	0.012	0.025	0.334	0.371	3810	123.0	0.007	0.014	0.107	0.128	1356	36.20	0.000	0.000	0.004	0.004	12
17	109.4	0.010	0.020	0.454	0.483	4567	117.0	0.006	0.013	0.051	0.070	703	35.01	0.000	0.000	0.003	0.003	10
18	81.06	0.000	0.000	0.385	0.385	2694	107.8	0.005	0.010	0.033	0.048	443	34.85	0.000	0.000	0.003	0.003	9
19	81.07	0.000	0.000	0.138	0.138	967	101.9	0.003	0.007	0.029	0.039	345	34.46	0.000	0.000	0.003	0.003	9
20	128.4	0.013	0.027	0.652	0.692	7675	96.38	0.000	0.000	0.024	0.024	197	32.00	0.000	0.000	0.003	0.003	7
21	94.26	0.000	0.000	0.301	0.301	2449	92.45	0.000	0.000	0.019	0.019	149	30.73	0.000	0.000	0.003	0.003	7
22	77.31	0.000	0.000	0.195	0.195	1299	87.81	0.000	0.000	0.015	0.015	112	30.02	0.000	0.000	0.003	0.003	7
23	79.62	0.000	0.000	0.214	0.214	1469	75.00	0.000	0.000	0.013	0.013	82	29.50	0.000	0.000	0.003	0.003	6
24	142.9	0.012	0.023	0.406	0.440	5436	72.77	0.000	0.000	0.011	0.011	67	29.17	0.000	0.000	0.002	0.002	6
25	161.0	0.013	0.025	0.451	0.490	6815	67.17	0.000	0.000	0.010	0.010	59	29.19	0.000	0.000	0.002	0.002	6
26	138.9	0.010	0.018	0.270	0.298	3571	63.79	0.000	0.000	0.010	0.010	54	29.00	0.000	0.000	0.002	0.002	6
27	110.2	0.007	0.018	0.244	0.269	2560	61.66	0.000	0.000	0.009	0.009	48	28.00	0.000	0.000	0.002	0.002	5
28	107.7	0.006	0.017	0.232	0.254	2365	59.37	0.000	0.000	0.008	0.008	43	28.27	0.000	0.000	0.002	0.002	5
29	93.34	0.000	0.000	0.122	0.122	981	58.72	0.000	0.000	0.008	0.008	41	28.62	0.000	0.000	0.002	0.002	5
30	113.1	0.007	0.018	0.255	0.280	2733	56.00	0.000	0.000	0.008	0.008	37	27.45	0.000	0.000	0.002	0.002	4
31							49.30	0.000	0.000	0.007	0.007	29						
Ten Daily Mean																		
Ten Daily I	113.1	0.018	0.030	0.294	0.343	4126	156.4	0.011	0.021	0.463	0.495	7153	44.76	0.000	0.000	0.006	0.006	24
Ten Daily II	107.9	0.008	0.016	0.392	0.415	4130	132.3	0.007	0.013	0.216	0.236	3389	36.63	0.000	0.000	0.004	0.004	12
Ten Daily III	111.8	0.006	0.012	0.269	0.286	2968	67.64	0.000	0.000	0.011	0.011	65	29.00	0.000	0.000	0.002	0.002	6
Monthly																		
Total						112233						106141						414

Annual Sediment Load (Metric Tonnes) : 520582

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Dec						Jan						Feb					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	27.05	0.000	0.000	0.002	0.002	4	10.00	0.000	0.000	0.001	0.001	1	6.441	0.000	0.000	0.001	0.001	1
2	26.59	0.000	0.000	0.002	0.002	4	10.42	0.000	0.000	0.001	0.001	1	6.391	0.000	0.000	0.001	0.001	0
3	26.98	0.000	0.000	0.002	0.002	4	10.08	0.000	0.000	0.001	0.001	1	5.803	0.000	0.000	0.001	0.001	0
4	25.50	0.000	0.000	0.002	0.002	4	10.08	0.000	0.000	0.001	0.001	1	5.843	0.000	0.000	0.001	0.001	0
5	24.06	0.000	0.000	0.002	0.002	3	9.635	0.000	0.000	0.001	0.001	1	5.500	0.000	0.000	0.001	0.001	0
6	22.25	0.000	0.000	0.001	0.001	3	9.722	0.000	0.000	0.001	0.001	1	5.128	0.000	0.000	0.001	0.001	0
7	21.57	0.000	0.000	0.001	0.001	2	10.08	0.000	0.000	0.001	0.001	1	5.049	0.000	0.000	0.001	0.001	0
8	21.09	0.000	0.000	0.001	0.001	2	10.00	0.000	0.000	0.001	0.001	1	4.990	0.000	0.000	0.001	0.001	0
9	20.90	0.000	0.000	0.001	0.001	2	8.850	0.000	0.000	0.001	0.001	1	5.129	0.000	0.000	0.001	0.001	0
10	19.02	0.000	0.000	0.001	0.001	2	8.967	0.000	0.000	0.001	0.001	1	4.798	0.000	0.000	0.001	0.001	0
11	19.00	0.000	0.000	0.002	0.002	2	8.771	0.000	0.000	0.001	0.001	1	4.857	0.000	0.000	0.001	0.001	0
12	19.00	0.000	0.000	0.002	0.002	2	8.599	0.000	0.000	0.001	0.001	1	4.700	0.000	0.000	0.001	0.001	0
13	14.45	0.000	0.000	0.001	0.001	2	8.179	0.000	0.000	0.001	0.001	1	4.613	0.000	0.000	0.001	0.001	0
14	14.01	0.000	0.000	0.001	0.001	2	8.257	0.000	0.000	0.001	0.001	1	4.619	0.000	0.000	0.001	0.001	0
15	14.05	0.000	0.000	0.001	0.001	2	8.000	0.000	0.000	0.001	0.001	1	4.244	0.000	0.000	0.001	0.001	0
16	14.81	0.000	0.000	0.001	0.001	2	8.180	0.000	0.000	0.001	0.001	1	4.173	0.000	0.000	0.001	0.001	0
17	13.88	0.000	0.000	0.001	0.001	1	7.878	0.000	0.000	0.001	0.001	1	4.259	0.000	0.000	0.001	0.001	0
18	13.75	0.000	0.000	0.001	0.001	2	7.610	0.000	0.000	0.001	0.001	1	4.085	0.000	0.000	0.001	0.001	0
19	13.62	0.000	0.000	0.001	0.001	2	7.483	0.000	0.000	0.001	0.001	1	4.000	0.000	0.000	0.001	0.001	0
20	13.67	0.000	0.000	0.001	0.001	2	7.740	0.000	0.000	0.001	0.001	1	3.452	0.000	0.000	0.001	0.001	0
21	12.31	0.000	0.000	0.001	0.001	1	7.510	0.000	0.000	0.001	0.001	1	3.422	0.000	0.000	0.001	0.001	0
22	12.18	0.000	0.000	0.001	0.001	1	7.748	0.000	0.000	0.001	0.001	1	3.022	0.000	0.000	0.001	0.001	0
23	11.81	0.000	0.000	0.001	0.001	1	7.344	0.000	0.000	0.001	0.001	1	3.020	0.000	0.000	0.001	0.001	0
24	10.81	0.000	0.000	0.001	0.001	1	7.171	0.000	0.000	0.001	0.001	1	3.000	0.000	0.000	0.001	0.001	0
25	11.00	0.000	0.000	0.001	0.001	1	7.150	0.000	0.000	0.001	0.001	1	2.898	0.000	0.000	0.001	0.001	0
26	10.27	0.000	0.000	0.001	0.001	1	7.000	0.000	0.000	0.001	0.001	1	3.000	0.000	0.000	0.001	0.001	0
27	10.95	0.000	0.000	0.001	0.001	1		0.000	0.000	0.001	0.001		2.642	0.000	0.000	0.001	0.001	0
28	10.93	0.000	0.000	0.001	0.001	1	6.661	0.000	0.000	0.001	0.001	0	2.712	0.000	0.000	0.001	0.001	0
29	10.76	0.000	0.000	0.001	0.001	1	7.000	0.000	0.000	0.001	0.001	1						
30	10.46	0.000	0.000	0.001	0.001	1	6.520	0.000	0.000	0.001	0.001	1						
31	10.41	0.000	0.000	0.001	0.001	1	6.460	0.000	0.000	0.001	0.001	1						
Ten Daily Mean																		
Ten Daily I	23.50	0.000	0.000	0.001	0.001	3	9.783	0.000	0.000	0.001	0.001	1	5.507	0.000	0.000	0.001	0.001	0
Ten Daily II	15.02	0.000	0.000	0.001	0.001	2	8.070	0.000	0.000	0.001	0.001	1	4.300	0.000	0.000	0.001	0.001	0
Ten Daily III	11.08	0.000	0.000	0.001	0.001	1	7.056	0.000	0.000	0.001	0.001	1	2.965	0.000	0.000	0.001	0.001	0
Monthly																		
Total						60						20						9

Annual Sediment Load (Metric Tonnes) : 520582

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

Day	Mar						Apr						May					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	2.239	0.000	0.000	0.007	0.007	1	2.066	0.000	0.000	0.005	0.005	1	3.285					
2	2.287	0.000	0.000	0.001	0.001	0	2.000	0.000	0.000	0.005	0.005	1	8.713					
3	2.144	0.000	0.000	0.001	0.001	0	1.985	0.000	0.000	0.005	0.005	1	4.615					
4	2.159	0.000	0.000	0.001	0.001	0	1.857	0.000	0.000	0.005	0.005	1	3.424					
5	2.000	0.000	0.000	0.001	0.001	0	1.914	0.000	0.000	0.005	0.005	1	2.931					
6	1.929	0.000	0.000	0.001	0.001	0	1.852	0.000	0.000	0.005	0.005	1	2.628					
7	1.928	0.000	0.000	0.001	0.001	0	1.507	0.000	0.000	0.004	0.004	0						
8	1.784	0.000	0.000	0.001	0.001	0	1.469	0.000	0.000	0.004	0.004	0	5.488					
9	1.768	0.000	0.000	0.001	0.001	0	1.400	0.000	0.000	0.004	0.004	0	12.87					
10	1.862	0.000	0.000	0.001	0.001	0	1.359	0.000	0.000	0.000	0.000	0						
11	2.856	0.000	0.000	0.001	0.001	0	1.415	0.000	0.000	0.000	0.000	0	10.60					
12	32.00	0.000	0.000	0.013	0.013	37	1.382	0.000	0.000	0.000	0.000	0	7.155					
13	29.00	0.000	0.000	0.012	0.012	30	1.350	0.000	0.000	0.000	0.000	0	5.391					
14	16.42	0.000	0.000	0.100	0.100	141	1.300	0.000	0.000	0.000	0.000	0						
15	12.89	0.000	0.000	0.078	0.078	87	1.238	0.000	0.000	0.000	0.000	0	4.208					
16	9.176	0.000	0.000	0.057	0.057	45	1.250	0.000	0.000	0.000	0.000	0	3.950					
17	7.673	0.000	0.000	0.047	0.047	31	1.203	0.000	0.000	0.000	0.000	0	3.543					
18	6.564	0.000	0.000	0.040	0.040	23	1.147	0.000	0.000	0.000	0.000	0	3.132					
19	6.000	0.000	0.000	0.036	0.036	19	1.084	0.000	0.000	0.000	0.000	0	3.096					
20	4.556	0.000	0.000	0.031	0.031	12	1.059	0.000	0.000	0.000	0.000	0	2.674					
21	4.394	0.000	0.000	0.030	0.030	12	1.004	0.000	0.000	0.000	0.000	0						
22	3.891	0.000	0.000	0.027	0.027	9	1.043	0.000	0.000	0.000	0.000	0	1.774					
23	3.358	0.000	0.000	0.023	0.023	7	1.000	0.000	0.000	0.000	0.000	0	1.758					
24	3.322	0.000	0.000	0.023	0.023	7	1.039	0.000	0.000	0.000	0.000	0	2.085					
25	3.215	0.000	0.000	0.022	0.022	6	1.023	0.000	0.000	0.000	0.000	0	3.644					
26	2.760	0.000	0.000	0.021	0.021	5	0.909	0.000	0.000	0.000	0.000	0	4.714					
27	2.294	0.000	0.000	0.005	0.005	1	0.889	0.000	0.000	0.000	0.000	0	4.933					
28	2.303	0.000	0.000	0.005	0.005	1	0.886	0.000	0.000	0.000	0.000	0						
29	2.234	0.000	0.000	0.005	0.005	1	0.826	0.000	0.000	0.000	0.000	0	9.188					
30	2.033	0.000	0.000	0.005	0.005	1	2.618	0.000	0.000	0.000	0.000	0	7.776					
31	2.036	0.000	0.000	0.005	0.005	1							7.290					
Ten Daily Mean																		
Ten Daily I	2.010	0.000	0.000	0.001	0.001	0	1.741	0.000	0.000	0.004	0.004	1	5.494					
Ten Daily II	12.71	0.000	0.000	0.042	0.042	43	1.243	0.000	0.000	0.000	0.000	0	4.861					
Ten Daily III	2.894	0.000	0.000	0.015	0.015	4	1.124	0.000	0.000	0.000	0.000	0	4.796					
Monthly																		
Total						477						6						

Annual Sediment Load (Metric Tonnes) : 520582

Annual Sediment Load for period : 1973-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

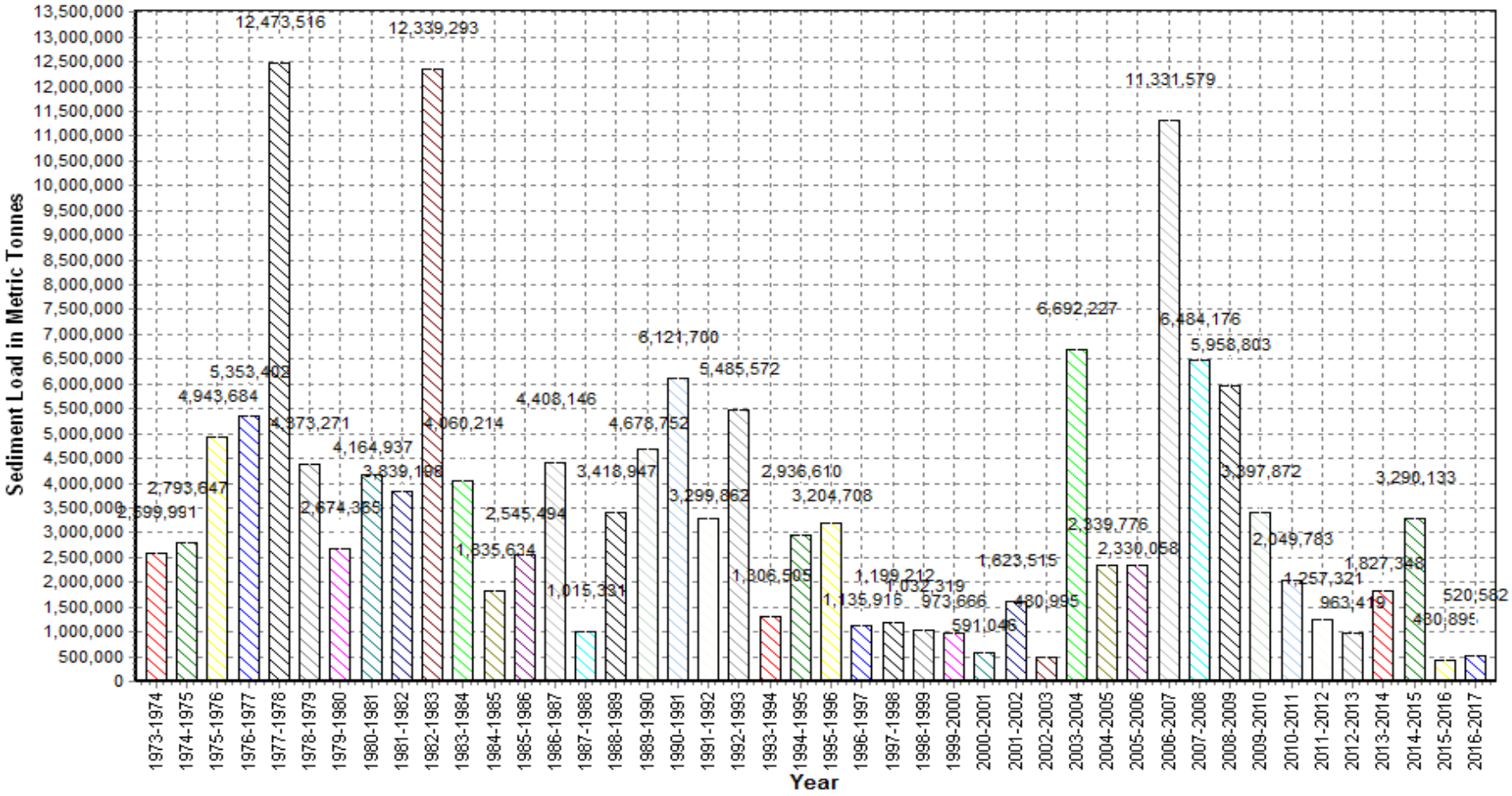
Local River : Vamsadhara **Sub-Division : Behrampur**

Year	Monsoon (M.T.)	Non-Monsoon (M.T.)	Annual Load (M.T.)	Annual Run Off (MCM)
1973-1974	2569538	30454	2599991	1402
1974-1975	2790025	3622	2793647	1041
1975-1976	4882208	61477	4943684	3069
1976-1977	5188944	164458	5353402	2627
1977-1978	12453545	19972	12473516	1892
1978-1979	4358146	15125	4373271	2978
1979-1980	2669363	5001	2674365	2124
1980-1981	4004290	160647	4164937	2455
1981-1982	3786144	53054	3839198	2216
1982-1983	12299387	39905	12339293	1983
1983-1984	4025441	34774	4060214	2327
1984-1985	1807576	28058	1835634	1211
1985-1986	2518690	26804	2545494	1747
1986-1987	4398063	10083	4408146	2278
1987-1988	960277	55054	1015331	725
1988-1989	3414346	4601	3418947	2318
1989-1990	2865627	1813125	4678752	2259
1990-1991	6062374	59325	6121700	6378
1991-1992	3242905	56957	3299862	3412
1992-1993	5469000	16572	5485572	4180
1993-1994	1294039	12467	1306505	1371
1994-1995	2225060	711550	2936610	4018
1995-1996	3158582	46126	3204708	4157
1996-1997	1121950	13966	1135916	1291
1997-1998	1111565	87647	1199212	1632
1998-1999	1017652	14667	1032319	1811
1999-2000	931830	41836	973666	1484
2000-2001	590826	221	591046	1143
2001-2002	1621344	2171	1623515	2158
2002-2003	480891	104	480995	629
2003-2004	6647555	44672	6692227	3482
2004-2005	2332260	7516	2339776	2749
2005-2006	2315377	14681	2330058	2650
2006-2007	11315384	16195	11331579	6422
2007-2008	6433261	50916	6484176	3968
2008-2009	5955785	3018	5958803	3070
2009-2010	3385979	11893	3397872	2807
2010-2011	2026336	23447	2049783	3138
2011-2012	1243490	13831	1257321	1955
2012-2013	956305	7114	963419	2268
2013-2014	1767458	59890	1827348	3849
2014-2015	3289200	933	3290133	5279
2015-2016	426732	4163	430895	1438
2016-2017	520010	572	520582	1318

Annual Sediment Load for the period: 1973-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

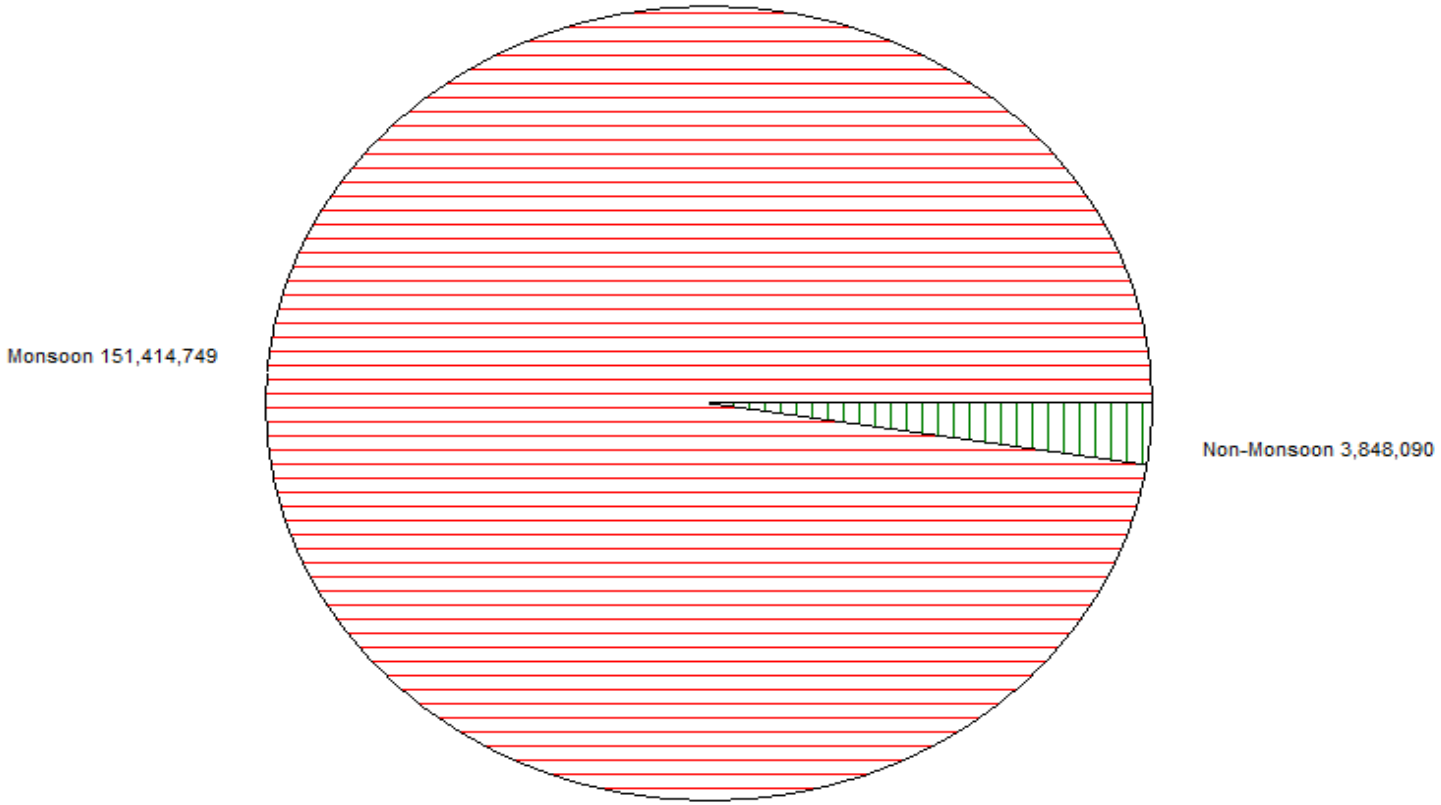
Local River : Vamsadhara **Sub-Division : Behrampur**



Seasonal Sediment Load for the period : 1973-2016

Station Name : KASHINAGAR (AV000J4)
Local River : Vamsadhara

Division : E.E., Bhubaneswar
Sub-Division : Behrampur



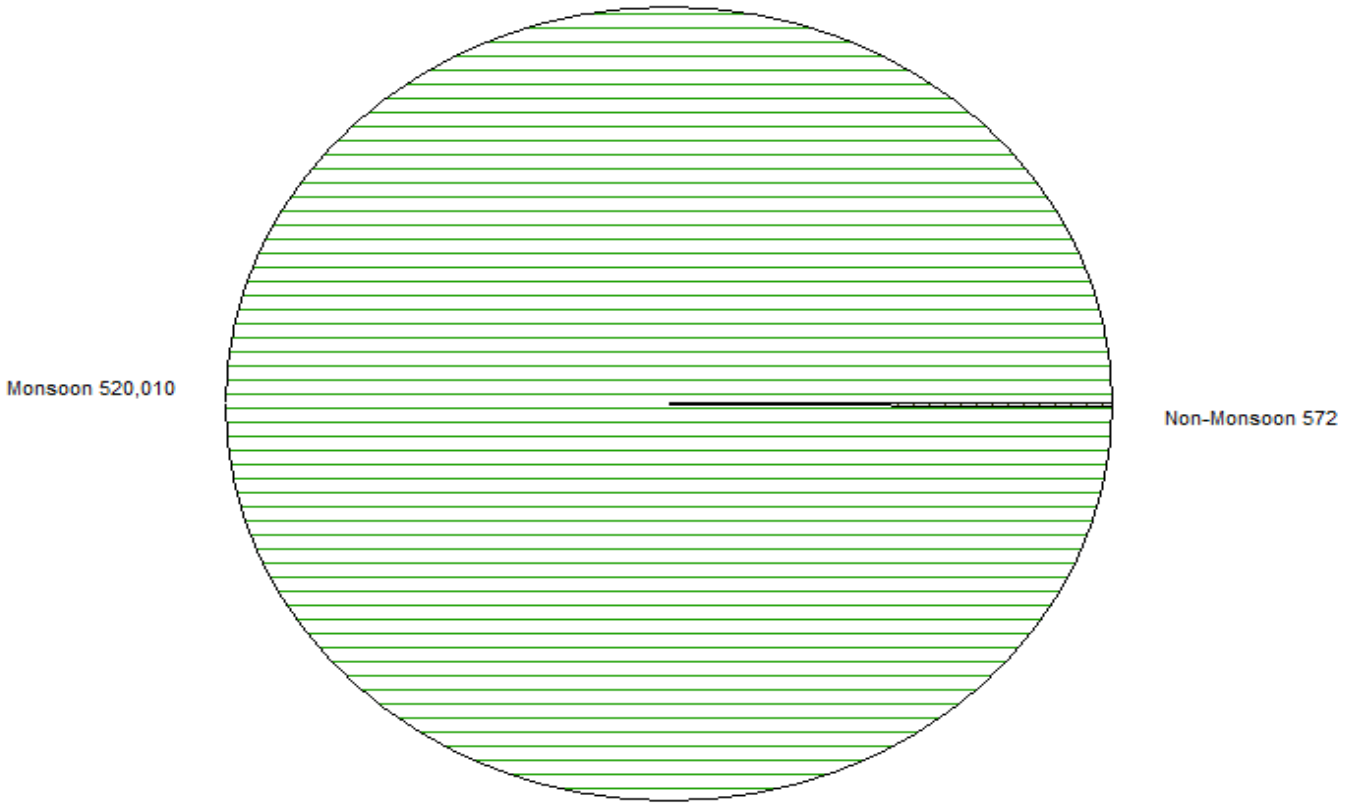
Seasonal Sediment Load for the Year: 2016-2017

Station Name : KASHINAGAR (AV000J4)

Local River : Vamsadhara

Division : E.E., Bhubaneswar

Sub-Division : Behrampur



Water Quality Datasheet for the period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **River Water Analysis** **Sub-Division : Behrampur**

S.No	Parameters	6/1/2016	8/1/2016	10/1/2016	12/1/2016	2/1/2017	4/1/2017
		A	A	A	A	A	A
	PHYSICAL						
1	Q (cumec)						
2	Colour_Cod (-)	Clear	Light Brown	Light Brown	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	1250	156	328	553	334	435
4	EC_GEN (µmho/cm)	1252	159	331	558	336	438
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	6.2	7.7	7.3	8.2	7.9	8.0
7	pH_GEN (pH units)	6.2	7.8	7.4	8.3	8.0	8.1
8	Temp (deg C)	32.0	31.5	33.0	27.5	22.5	28.7
	CHEMICAL						
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	310	291	60	60	65	69
3	B (mg/L)	0.01	0.02	0.01	0.01	0.01	0.02
4	Ca (mg/L)	178	168	109	98	47	48
5	Cl (mg/L)	9.4	13.2	9.4	11.3	13.2	18.9
6	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)	0.5	0.2	1.0	0.5	0.5	0.4
9	HCO3 (mg/L)	378	355	73	73	79	85
10	K (mg/L)	1.7	11.0	7.6	8.3	17.2	18.1
11	Mg (mg/L)	63.2	61.2	38.9	40.0	21.4	22.4
12	Na (mg/L)	7.1	27.7	22.6	30.8	49.6	60.2
13	NO2+NO3 (mg N/L)	1.23	1.37	1.23	1.21	1.12	1.15
14	NO2-N (mgN/L)	0.00	0.00	0.03	0.00	0.00	0.00
15	NO3-N (mgN/L)	1.23	1.37	1.21	1.21	1.12	1.15
16	P-Tot (mgP/L)	0.010	0.010	0.010	0.010	0.010	0.010
17	SiO2 (mg/L)	6.0	7.0	6.0	6.0	7.0	7.5
18	SO4 (mg/L)	3.3	3.6	17.4	17.6	17.8	18.0
	BIOLOGICAL/BACTERIOLOGICAL						
	TRACE & TOXIC						
	CHEMICAL INDICES						
1	HAR_Ca (mgCaCO3/L)	445	421	273	245	116	120
2	HAR_Total (mgCaCO3/L)	708	676	435	411	205	213
3	Na% (%)	2	8	10	14	32	36
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	0.1	0.5	0.5	0.7	1.5	1.8
	PESTICIDES						

Water Quality Summary for the period : 2016-2017

Station Name : KASHINAGAR (AV000J4) **Division : E.E., Bhubaneswar**

Local River : Vamsadhara **Sub-Division : Behrampur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)				
2	EC_FLD (µmho/cm)	6	1250	156	509
3	EC_GEN (µmho/cm)	6	1252	159	512
4	pH_FLD (pH units)	6	8.2	6.2	7.6
5	pH_GEN (pH units)	6	8.3	6.2	7.6
6	Temp (deg C)	6	33.0	22.5	29.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	310	60	142
3	B (mg/L)	6	0.02	0.01	0.01
4	Ca (mg/L)	6	178	47	108
5	Cl (mg/L)	6	18.9	9.4	12.6
6	CO3 (mg/L)	6	0.0	0.0	0
7	F (mg/L)	6	0.05	0.05	0.05
8	Fe (mg/L)	6	1.0	0.2	0.5
9	HCO3 (mg/L)	6	378	73	174
10	K (mg/L)	6	18.1	1.7	10.7
11	Mg (mg/L)	6	63.2	21.4	41.2
12	Na (mg/L)	6	60.2	7.1	33
13	NO2+NO3 (mg N/L)	6	1.37	1.12	1.22
14	NO2-N (mgN/L)	6	0.03	0.00	0
15	NO3-N (mgN/L)	6	1.37	1.12	1.21
16	P-Tot (mgP/L)	6	0.010	0.010	0.01
17	SiO2 (mg/L)	6	7.5	6.0	6.6
18	SO4 (mg/L)	6	18.0	3.3	13
	BIOLOGICAL/BACTERIOLOGICAL				
	TRACE & TOXIC				
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	445	116	270
2	HAR_Total (mgCaCO3/L)	6	708	205	441
3	Na% (%)	6	36	2	17
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	1.8	0.1	0.8
	PESTICIDES				

Water Quality Seasonal Average for the period: 2002-2017

Station Name : KASHINAGAR (AV000J4) | **Division : E.E., Bhubaneswar**

Local River : Vamsadhara | **River Water** | **Sub-Division : Behrampur**

S.No	Parameters	Flood																	
		Jun - Oct																	
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002-2003	2003-2004	2004-2005
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)	238	207	212			275		352	275	229	218	250	250	405	578	342	177	222
3	EC_GEN (µmho/cm)	248	207	211			270		352	270	229	218	250	250	403	581	335	197	210
4	pH_FLD (pH units)	7.6	7.2	7.6			7.9		7.7	7.9	7.8	7.7	7.5	7.7	7.3	7.1	7.4	7.4	7.9
5	pH_GEN (pH units)	7.7	7.2	7.6			7.9		7.7	7.9	7.8	7.7	7.5	7.7	7.3	7.1	7.4	7.4	8.1
6	Temp (deg C)	29.0	29.2	31.3			28.3		29.0	29.5	29.3	26.6	26.3	27.3	24.3	32.2	18.8	22.4	21.5
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)						0.0		2.0		0.0	0.0		0.0	0.0	0.0			
2	ALK-TOT (mgCaCO3/L)						86		88		125	81		82	77	220			
3	B (mg/L)	0.00	0.00	0.00			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
4	Ca (mg/L)	25	20	19			27		26	27	17	26	16	22	21	152	35	19	21
5	Cl (mg/L)	19.0	15.5	17.5			21.4		35.9	19.5	15.7	18.9	17.8	11.0	12.6	10.7	24.2	13.6	15.5
6	CO3 (mg/L)	0.0	0.0	0.0			0.0		2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.06	0.06	0.21			0.00		0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.02	0.02	0.51
8	Fe (mg/L)	0.2	0.1	0.2			0.1		0.3	0.2	0.0	2.2	0.0	0.7	0.5	0.6	0.1	0.1	0.3
9	HCO3 (mg/L)	100	85	94			109		102	102	152	110	81	100	94	269	156	80	99
10	K (mg/L)	3.5	3.0	3.7			3.4		10.7	4.3	2.5	3.0	1.1	2.4	2.7	6.8	3.8	2.4	2.3
11	Mg (mg/L)	5.8	5.5	7.2			6.5		9.2	7.8	10.0	10.9	4.2	11.2	13.6	54.4	11.7	3.0	6.8
12	Na (mg/L)	12.5	11.8	11.7			15.7		24.9	12.8	9.8	12.1	11.5	20.6	7.8	19.1	14.8	10.9	9.9
13	NO2+NO3 (mg N/L)	0.73	0.60	0.36			1.63		0.44	0.81	0.38	0.73	0.53	1.63	0.85	1.28	0.63	0.25	0.04
14	NO2-N (mgN/L)	0.28	0.00	0.00			0.00		0.01	0.00	0.07	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
15	NO3-N (mgN/L)	0.45	0.60	0.36			1.63		0.43	0.81	0.31	0.73	0.52	1.63	0.84	1.27	0.63	0.25	0.04
16	o-PO4-P (mg P/L)			0.024			0.055		0.090										
17	P-Tot (mgP/L)	0.069	0.083	0.003			0.017		0.010	0.001	0.010	0.001	0.001	0.001	0.004	0.010	0.070	0.072	0.001
18	SiO2 (mg/L)	19.5	19.7	30.9			10.9		9.8	10.0	14.0	17.9	9.1	5.3	5.7	6.3	21.9	18.3	28.7
19	SO4 (mg/L)	5.3	4.2	3.2			7.3		17.6	21.8	22.4	18.9	21.5	6.9	16.3	8.1	3.1	1.7	1.8
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)	63	50	48			67		66	68	41	64	41	56	52	379	87	48	52
2	HAR_Total (mgCaCO3/L)	97	73	79			98		105	101	83	110	58	103	109	606	141	60	80
3	Na% (%)	25	26	23			26		27	21	20	17	30	30	13	7	22	29	21
4	RSC (-)	0.0	0.0	0.0			0.0		0.0	0.0	0.8	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0
5	SAR (-)	0.6	0.6	0.6			0.7		0.9	0.6	0.5	0.5	0.7	0.9	0.3	0.4	0.6	0.7	0.5
	PESTICIDES																		

Water Quality Seasonal Average for the period: 2002-2017

Station Name : KASHINAGAR (AV000J4) | **Division : E.E., Bhubaneswar**

Local River : Vamsadhara | **River Water** | **Sub-Division : Behrampur**

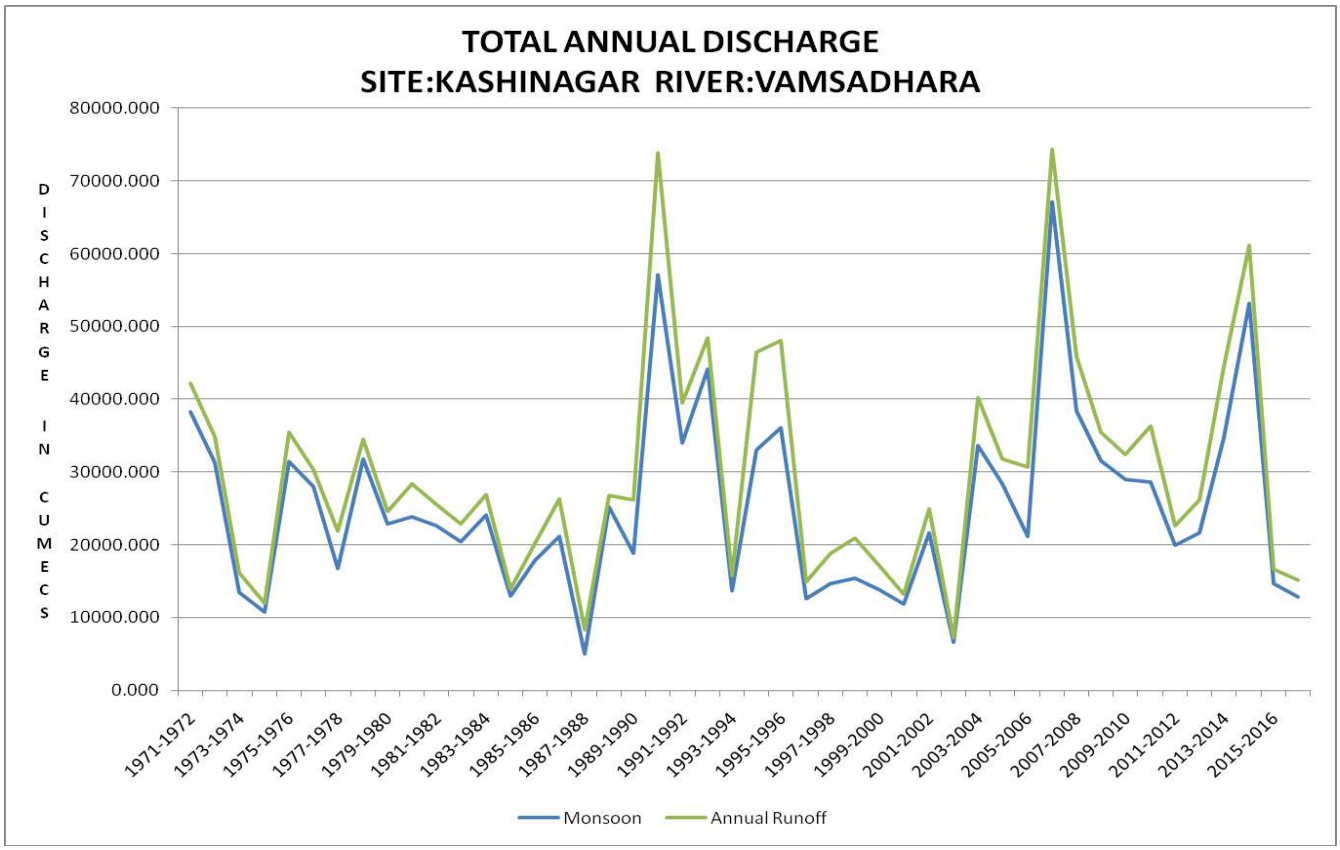
S.No	Parameters	Winter																	
		Nov - Feb																	
		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2003	2004	2005	2006	2007	2008
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)			232		240	300	265	192	190	418	575	444	345	308				230
3	EC_GEN (µmho/cm)			225		240	300	265	192	190	418	624	447	343	295				230
4	pH_FLD (pH units)			7.8		7.7	7.7	7.8	7.7	8.0	7.4	8.1	8.1	7.7	7.5				8.2
5	pH_GEN (pH units)			7.7		7.7	7.7	7.8	7.7	8.0	7.4	8.0	8.1	7.5	7.4				8.2
6	Temp (deg C)			19.1		18.8	22.9	21.5	27.6		23.8	26.0	25.0	28.0	27.5				25.0
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)			0.0		0.0	0.0	0.0	0.0		0.0	23.0	0.0						0.0
2	ALK-TOT (mgCaCO3/L)			80		76	88	132	115		110	194	62						79
3	B (mg/L)			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00				0.00
4	Ca (mg/L)			23		22	29	34	20	15	34	19	72	32	25				24
5	Cl (mg/L)			18.1		17.5	18.7	14.1	16.8	18.5	15.1	14.1	12.3	30.3	24.3				18.8
6	CO3 (mg/L)			0.0		0.0	0.0	0.0	0.0	0.0	0.0	27.7	0.0	0.0	0.0				0.0
7	F (mg/L)			0.04		0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00				0.05
8	Fe (mg/L)			0.3		0.2	0.1	0.0	2.0	0.0	0.2	0.4	0.5	0.1	0.0				0.0
9	HCO3 (mg/L)			98		93	108	161	129	90	135	180	76	148	129				96
10	K (mg/L)			3.3		2.7	2.7	2.2	3.2	1.4	2.3	3.2	12.8	3.7	3.8				3.6
11	Mg (mg/L)			5.6		8.8	9.7	17.5	11.0	3.5	4.2	10.7	30.7	9.7	9.7				5.4
12	Na (mg/L)			12.7		11.6	12.4	13.6	14.5	10.6	15.6	21.1	40.2	20.0	17.9				12.8
13	NO2+NO3 (mg N/L)			0.39		0.22	0.86	0.36	0.95	0.95	0.98	0.99	1.16	0.85	0.28				0.22
14	NO2-N (mgN/L)			0.00		0.00	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00				0.00
15	NO3-N (mgN/L)			0.39		0.22	0.86	0.29	0.95	0.95	0.98	0.98	1.16	0.85	0.28				0.22
16	o-PO4-P (mg P/L)			0.041		0.070													
17	P-Tot (mgP/L)			0.001		0.010	0.001	0.010	0.005	0.001	0.001	0.010	0.010	0.041	0.001				0.002
18	SiO2 (mg/L)			9.6		9.0	11.7	8.0	19.2	11.2	6.5	6.0	6.5	28.3	23.3				9.7
19	SO4 (mg/L)			10.5		13.0	12.5	1.4	3.8	21.4	15.5	2.7	17.7	2.2	2.5				10.2
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)			58		54	72	85	51	38	84	48	180	80	63				60
2	HAR_Total (mgCaCO3/L)			81		91	113	158	96	53	102	93	308	121	104				83
3	Na% (%)			25		22	20	16	24	30	25	32	23	26	27				24
4	RSC (-)			0.0		0.0	0.0	0.3	0.2	0.4	0.2	2.0	0.0	0.1	0.1				0.0
5	SAR (-)			0.6		0.5	0.5	0.5	0.6	0.6	0.7	1.0	1.1	0.8	0.8				0.6
	PESTICIDES																		

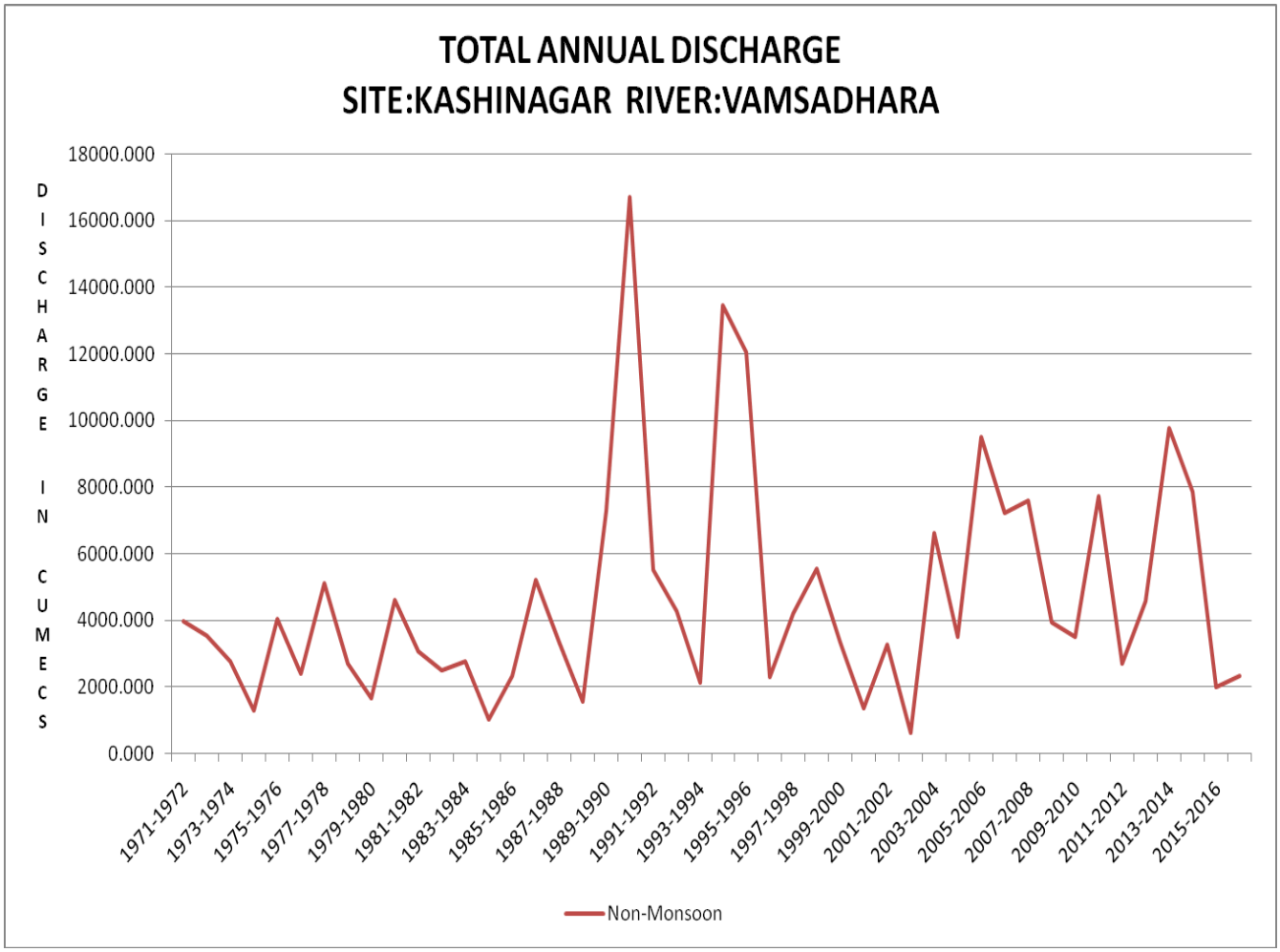
Water Quality Seasonal Average for the period: 2002-2017

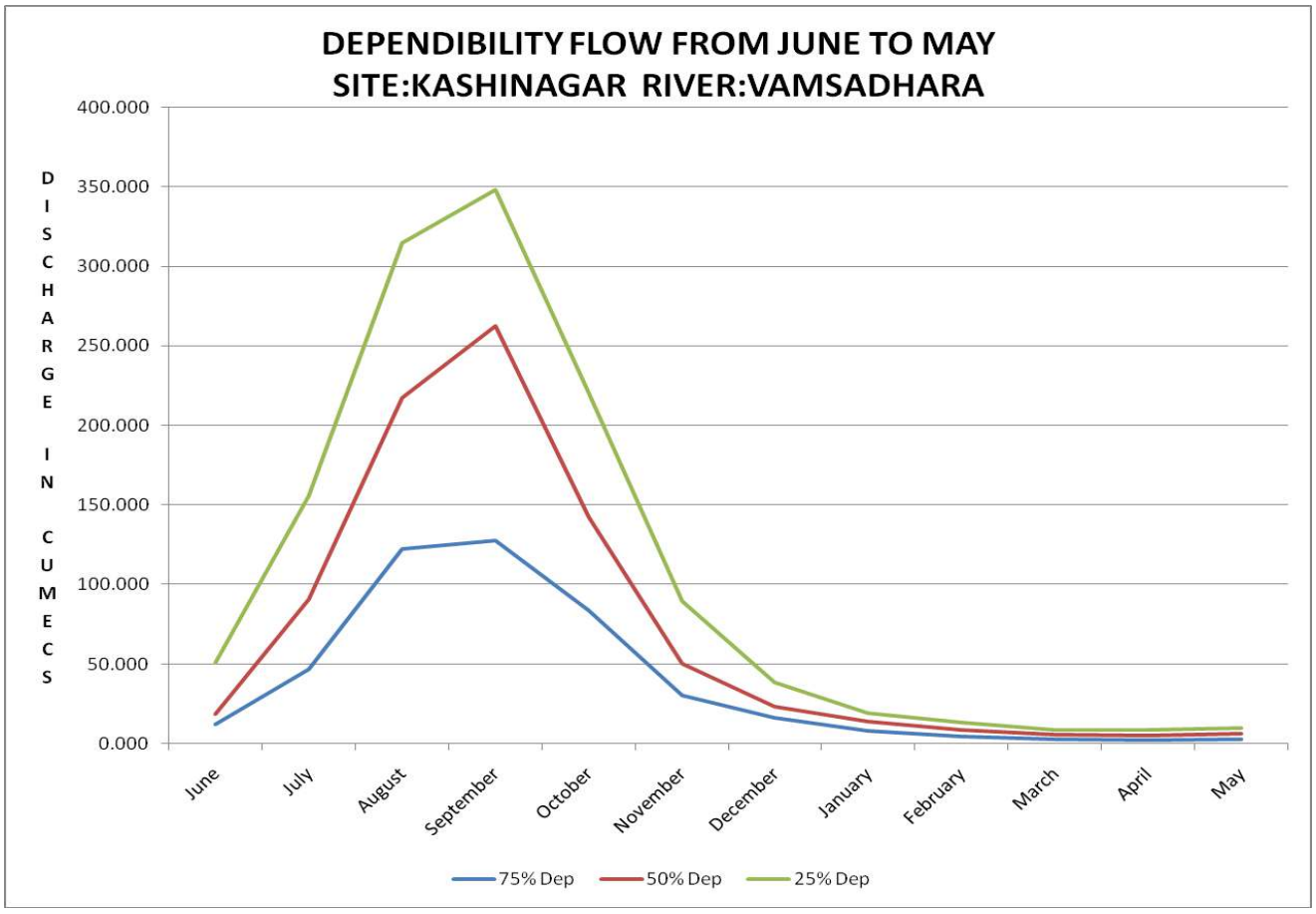
Station Name : KASHINAGAR (AV000J4) | **Division : E.E., Bhubaneswar**

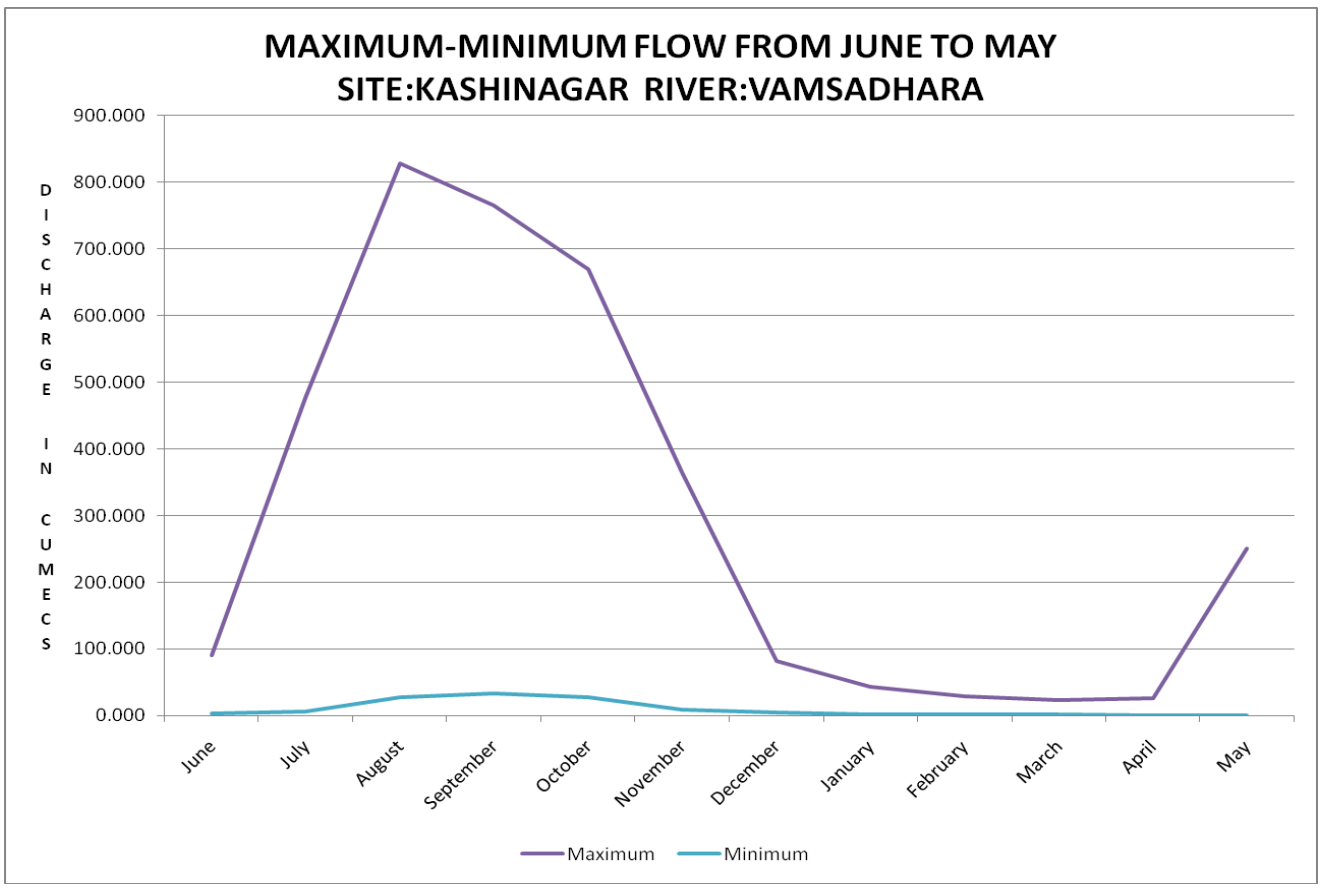
Local River : Vamsadhara | **River Water** | **Sub-Division : Behrampur**

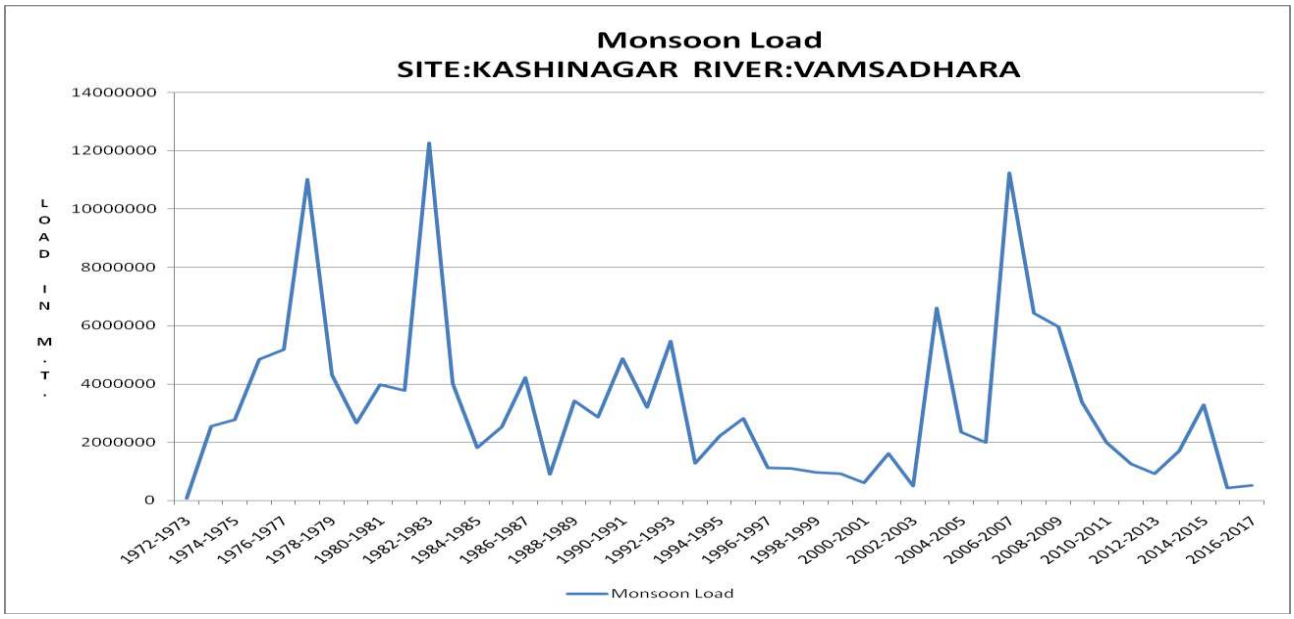
S.No	Parameters	Summer								
		Mar - May								
		2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL									
1	Q (cumec)									
2	EC_FLD (µmho/cm)		380	400	310	145	200	430	582	435
3	EC_GEN (µmho/cm)		380	400	310	145	200	430	599	438
4	pH_FLD (pH units)		8.4	7.9	7.9	7.4	8.0	7.9	8.1	8.0
5	pH_GEN (pH units)		8.4	7.9	7.9	7.4	8.0	7.9	8.1	8.1
6	Temp (deg C)		28.0	27.0		28.3	25.8	24.5	24.0	28.7
	CHEMICAL									
1	Alk-Phen (mgCaCO3/L)		0.0		0.0			0.0	9.2	0.0
2	ALK-TOT (mgCaCO3/L)		123		148			149	226	69
3	B (mg/L)		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02
4	Ca (mg/L)		26	32	35	22	16	42	26	48
5	Cl (mg/L)		33.4	22.6	22.6	23.8	22.3	22.6	17.0	18.9
6	CO3 (mg/L)		0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0
7	F (mg/L)		0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)		0.1	1.9	0.0	2.2	0.1	0.2	0.5	0.4
9	HCO3 (mg/L)		150	172	180	114	103	181	254	85
10	K (mg/L)		3.5	2.9	2.7	4.6	1.1	2.6	2.4	18.1
11	Mg (mg/L)		16.5	17.5	11.7	8.3	2.4	11.2	11.7	22.4
12	Na (mg/L)		24.6	16.9	20.2	12.6	10.4	20.1	24.8	60.2
13	NO2+NO3 (mg N/L)		0.34	1.16	0.36	1.04	1.15	0.91	0.70	1.15
14	NO2-N (mgN/L)		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
15	NO3-N (mgN/L)		0.34	1.16	0.29	1.04	1.15	0.91	0.70	1.15
16	o-PO4-P (mg P/L)		0.000							
17	P-Tot (mgP/L)		0.010	0.001	0.010	0.001	0.001	0.001	0.010	0.010
18	SiO2 (mg/L)		9.6	8.6	18.0	16.4	8.5	7.0	5.0	7.5
19	SO4 (mg/L)		12.2	12.8	2.8	5.6	25.6	18.0	2.8	18.0
	BIOLOGICAL/BACTERIOLOGICAL									
	TRACE & TOXIC									
	CHEMICAL INDICES									
1	HAR_Ca (mgCaCO3/L)		64	80	88	56	41	105	64	120
2	HAR_Total (mgCaCO3/L)		133	153	137	90	51	152	113	213
3	Na% (%)		28	19	24	22	30	22	32	36
4	RSC (-)		0.0	0.0	0.2	0.1	0.7	0.0	2.3	0.0
5	SAR (-)		0.9	0.6	0.8	0.6	0.6	0.7	1.0	1.8
	PESTICIDES									

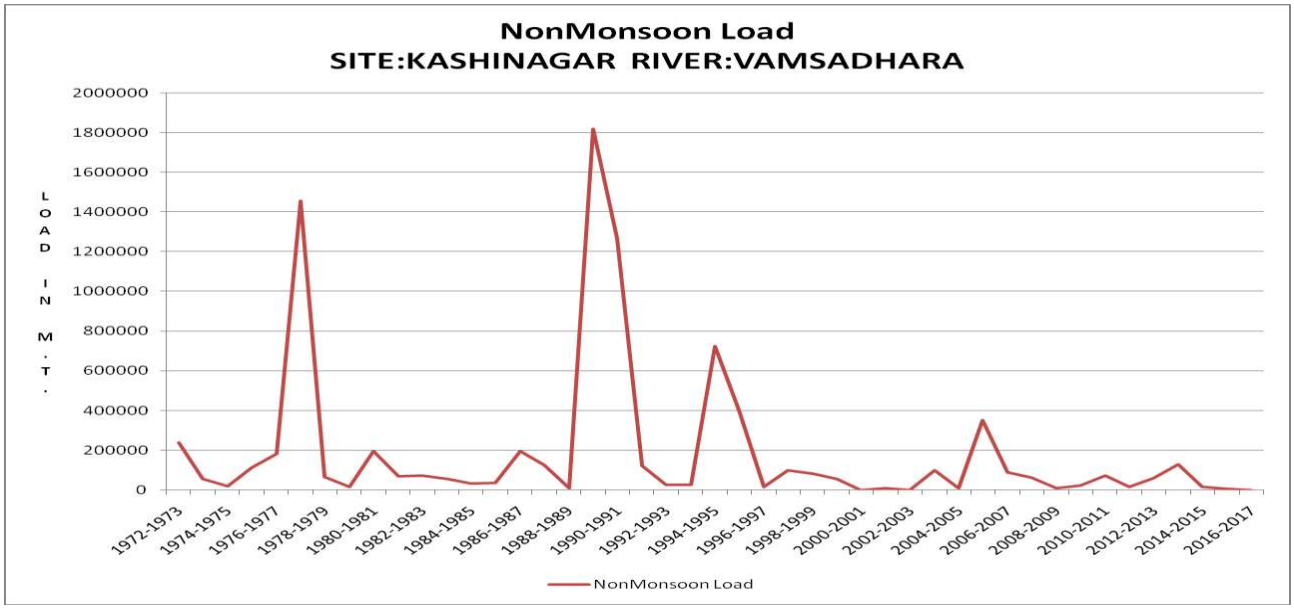

TOTAL ANNUAL DISCHARGE
SITE:KASHINAGAR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
80000.000
70000.000
60000.000
50000.000
40000.000
30000.000
20000.000
10000.000
0.000
1971-1972
1973-1974
1975-1976
1977-1978
1979-1980
1981-1982
1983-1984
1985-1986
1987-1988
1989-1990
1991-1992
1993-1994
1995-1996
1997-1998
1999-2000
2001-2002
2003-2004
2005-2006
2007-2008
2009-2010
2011-2012
2013-2014
2015-2016
Monsoon
Annual Runoff

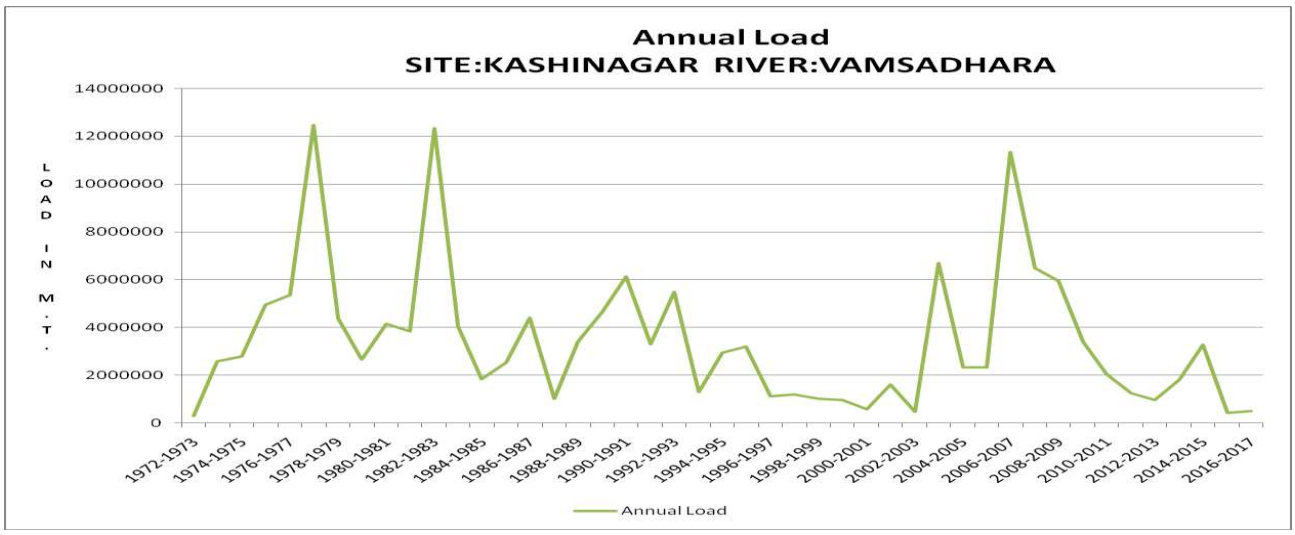

TOTAL ANNUAL DISCHARGE
SITE:KASHINAGAR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
18000.000
16000.000
14000.000
12000.000
10000.000
8000.000
6000.000
4000.000
2000.000
0.000
1971-1972
1973-1974
1975-1976
1977-1978
1979-1980
1981-1982
1983-1984
1985-1986
1987-1988
1989-1990
1991-1992
1993-1994
1995-1996
1997-1998
1999-2000
2001-2002
2003-2004
2005-2006
2007-2008
2009-2010
2011-2012
2013-2014
2015-2016
Non-Monsoon

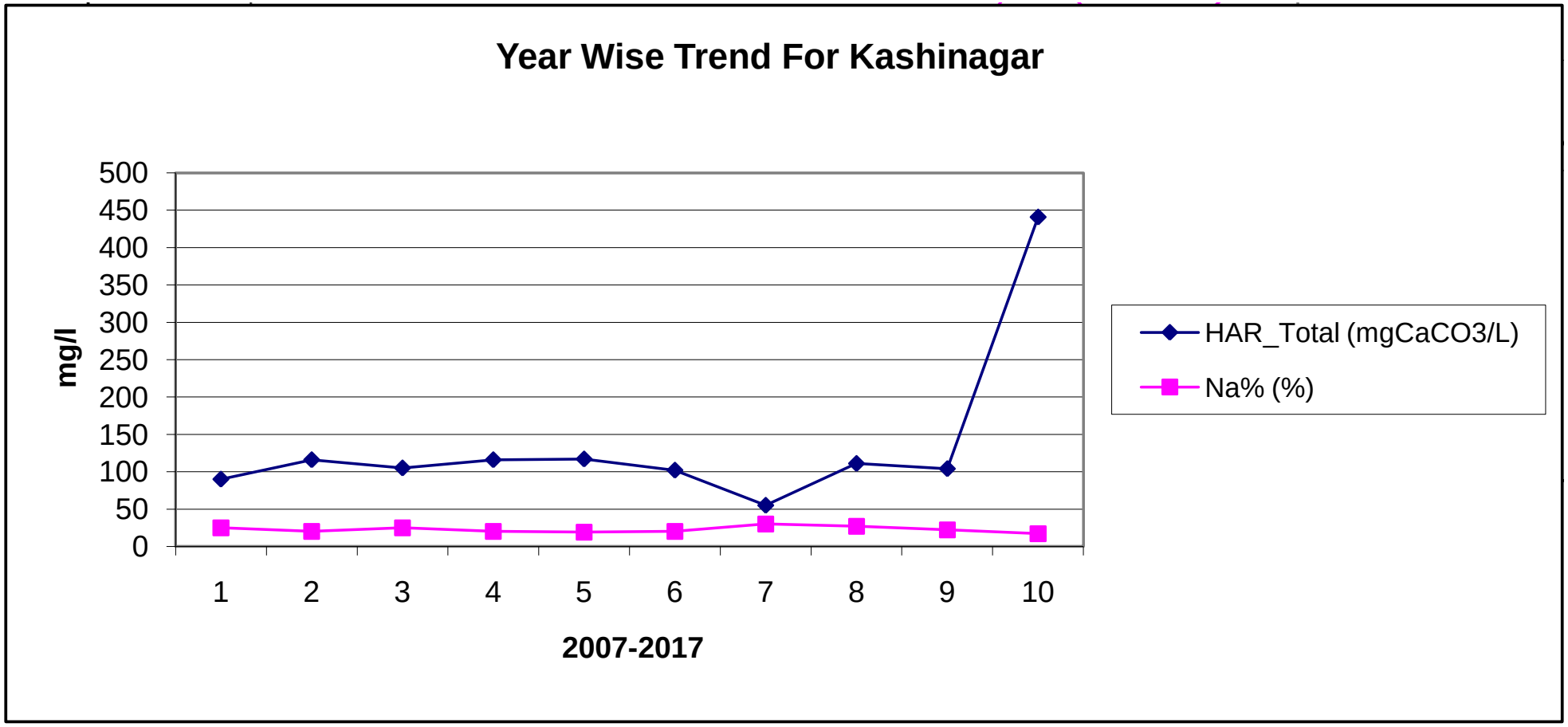

DEPENDIBILITY FLOW FROM JUNE TO MAY
SITE:KASHINAGAR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
400.000
350.000
300.000
250.000
200.000
150.000
100.000
50.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
75% Dep
50% Dep
25% Dep

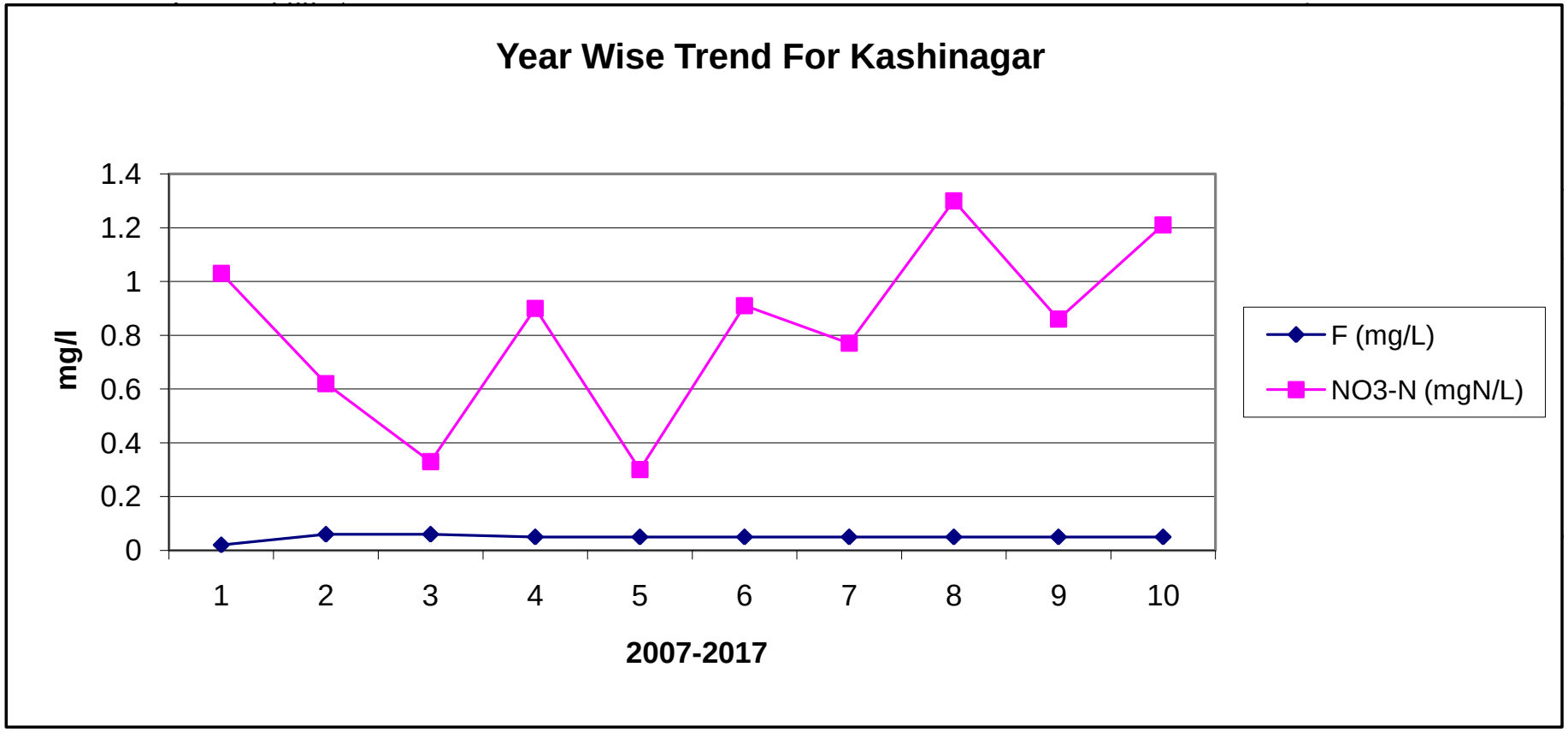

MAXIMUM-MINIMUM FLOW FROM JUNE TO MAY
SITE:KASHINAGAR RIVER:VAMSADHARA
DISCHARGE IN CUMECS
900.000
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
Maximum
Minimum

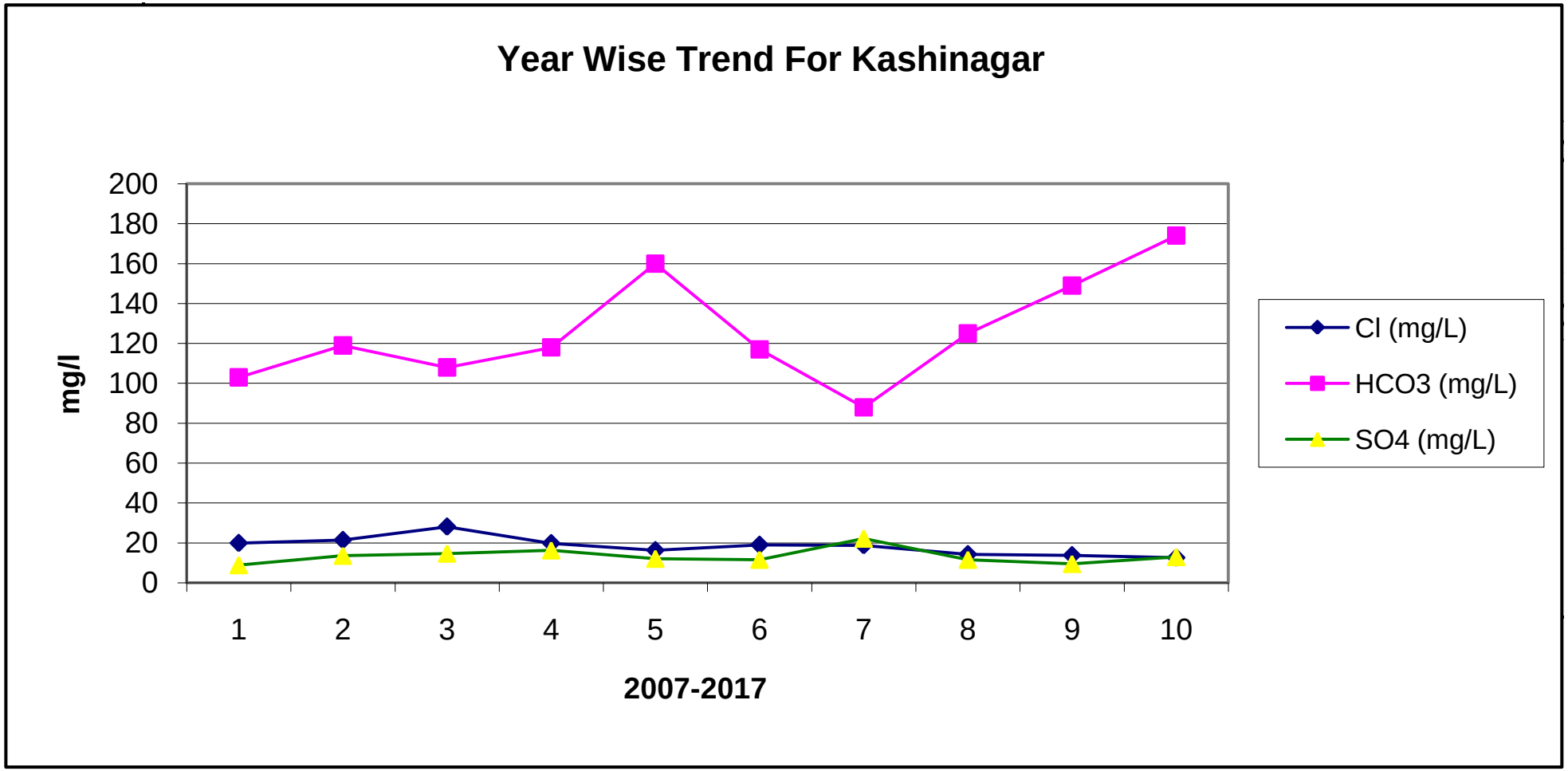

Monsoon Load
SITE:KASHINAGAR RIVER:VAMSADHARA
LOAD IN M.T.
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1972-1973
1974-1975
1976-1977
1978-1979
1980-1981
1982-1983
1984-1985
1986-1987
1988-1989
1990-1991
1992-1993
1994-1995
1996-1997
1998-1999
2000-2001
2002-2003
2004-2005
2006-2007
2008-2009
2010-2011
2012-2013
2014-2015
2016-2017
Monsoon Load

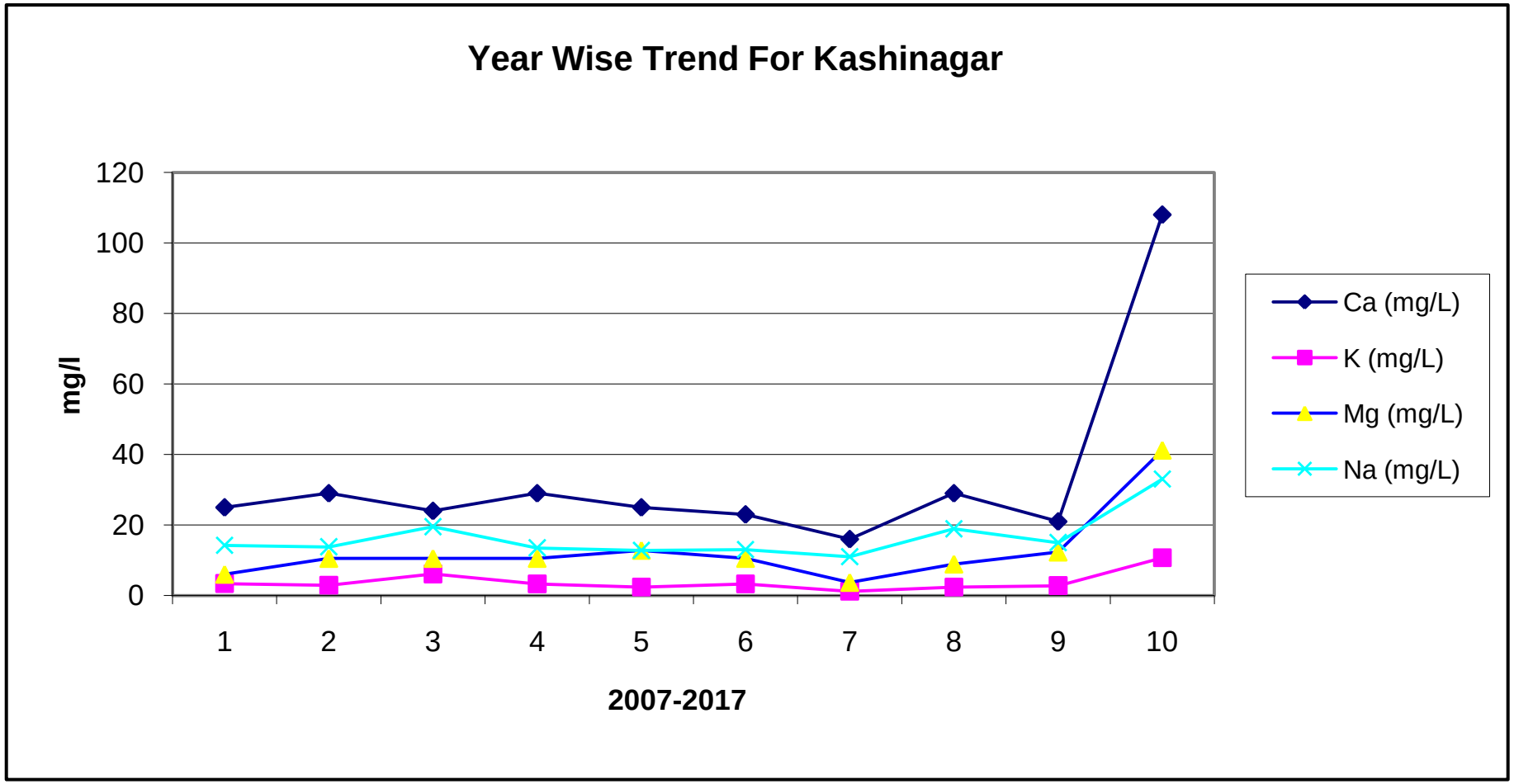

NonMonsoon Load
SITE:KASHINAGAR RIVER:VAMSADHARA
LOAD IN M.T.
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
1972-1973
1974-1975
1976-1977
1978-1979
1980-1981
1982-1983
1984-1985
1986-1987
1988-1989
1990-1991
1992-1993
1994-1995
1996-1997
1998-1999
2000-2001
2002-2003
2004-2005
2006-2007
2008-2009
2010-2011
2012-2013
2014-2015
2016-2017
NonMonsoon Load


Annual Load
SITE:KASHINAGAR RIVER:VAMSADHARA
LOAD IN M.T.
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1972-1973
1974-1975
1976-1977
1978-1979
1980-1981
1982-1983
1984-1985
1986-1987
1988-1989
1990-1991
1992-1993
1994-1995
1996-1997
1998-1999
2000-2001
2002-2003
2004-2005
2006-2007
2008-2009
2010-2011
2012-2013
2014-2015
2016-2017
Annual Load


Year Wise Trend For Kashinagar
500
450
400
350
300
250
200
150
100
50
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
HAR_Total (mgCaCO3/L)
Na% (%)


Year Wise Trend For Kashinagar
mg/l
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
9
10
2007-2017
F (mg/L)
NO3-N (mgN/L)


Year Wise Trend For Kashinagar
mg/l
200
180
160
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
2007-2017
Cl (mg/L)
HCO3 (mg/L)
SO4 (mg/L)


Year Wise Trend For Kashinagar
120
100
80
60
40
20
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
Ca (mg/L)
K (mg/L)
Mg (mg/L)
Na (mg/L)

RUSHIKULYA BASIN

RUSHIKULYA BASIN

1. GENERAL

1.1 Introduction

River Rushikulya is one of the East flowing river in Odisha. The river Rushikulya originates at an elevation of about 1000 m near Matabarhi village of Kandhamal district of Odisha State and lies within the geographical co-ordinates of 19° 07′ to 20° 19′ North latitude and 84° 01′ to 85° 06′ East longitude. The river flows through Purushottampur, Pratapur and joins with the Bay of Bengal at Ganjam district (Odisha). The total catchment area is 7700 sq.km., entirely in the districts of Kandhamal and Ganjam (Odisha).

The entire basin is grouped into flat plains and valleys with isolated hills. The coastal plains of the basin contain fertile and irrigated lands. The basin is continuously sloping towards main valley and hence no drainage congestion is anticipated.

Basin Map of Rushikulya river system showing the various hydrological and hydro-meteorological observation stations maintained by CWC and State Government and India Meteorological Department is enclosed herewith.

1.2 River system

The catchment is of a leaf shape and the basin is considerably harnessed by inter linking canal network among its tributaries. The details of the principal tributaries joining the river on both the banks are given below:

Name of River	River/Tributary	Length (km)	Catchment area (sq.km)	Percentage of total catchment area
Rushikulya	Main Stream	162	2798	36.3
Baghua	Left Tributary	68	736	9.6
Badanadi	Left Tributary	93	2353	30.6
Pathama	Right Tributary	43	663	8.6
Ghodahada	Right Tributary	83	1150	14.9
		Total	7700	100.0

1.3 Climatic Characteristics

The South West monsoon is normally active from June to October/November. The average annual rainfall is around 1360 mm. Very heavy rainfall occurs at several places in some years, which causes severe floods. In certain years, serious drought also occurs due to inadequate rainfall.

1.4 Geology

The catchment mostly comprises of Khondolite and Charcolite groups of rock formation. Ground water is available in the region of alluvium in confined and unconfined aquifers below 250 m. The basin is rich in mineral wealth. The major economic minerals are Lime Stone, Manganese, Sand Talc, black sand, Clay and grinding materials

1.5 Site Details

The basin is developed with an integrated canal system, which includes Jayamangal, Ghodahada, Daha dam and a few diversion weirs/ anicuts and number of Minor Irrigation Projects.

Details of water storage/ diversion structures in the Baitarani Basin are as below:

Sl.No.	Name of Project	River	Status
1.	Bhanjanagar Reservoir	Boringanalla	Existing
2.	Sorada Reservoir	Padma	Existing
3.	Ghodahada Reservoir	Ghodahad	Existing
4.	Baghua Reservoir	Baghua	Ongoing
5.	Daha Reservoir	Daha & Kalinga	Existing
6.	Hiradharbhati Barrage	Rushikulya	Existing
7.	Jagamangal weir	Rushikulya	Existing

2. STREAM FLOW DATA

2.1 Methodology

Area-velocity method is generally adopted for measuring discharge at sites. Cup type current meter is used to measure the velocity of the flow and the depth is measured by using sounding rod for depths upto 3 m and by log line beyond 3 m. Discharge by area velocity method is being observed once in a day starting at 0800 Hrs. at all the sites except on Sundays and holidays. Besides, silt and water quality observation are also being carried out at the sites of CWC as list above.

The observed stage and discharge figures for each season (monsoon and non-monsoon) are plotted and a mean Stage V/s. Discharge curve is drawn, giving due attention to the scattered points with reference to area, velocity etc.

The factors responsible for the shifting of the curves are also taken care of by studying the river cross section at regular intervals and with super imposition of previous years' Stage V/s. Discharge curves. Accordingly, the trend of the current curve is finalised. Finally, the discharges of the non observed days are computed from these Stage V/s. Discharge Curves.

2.2 Data Availability

Sl. No.	Code No.	Station Name	Type	Data available From	To
1.	ER000U5	Purushottampur	G & D	G - 14.07.1978	Continuing
				D - 14.06.1989	-do-
				S - 15.01.2001	-do-
				WQ- 08.10.2001	-do-
2	MADHABARIDA	Madhabarida	G	G - 09.08.1978	Continuing
3	SORADA	Sorada	G	G - 12.07.1978	Continuing

2.3 Explanatory Notes on Water Year Book

SWDES (Surface Water Data Entry Software), a custom made software for processing hydrological data, has been used for preparation of this volume. The explanatory notes described below can be used for interpretation of data presented in this volume.

i) Water Year ranges from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

ii) Discharge is given in cubic meters per second.

iii) Discharges are expressed as 0.000 when river bed is dry and 0.000 N.F. when velocity is observed as 'NIL'.

iv) The zero R.L. of gauge is a datum level fixed for given site, which is kept 1 or 2 m lower than the lowest water level recorded in a perennial stream. In a non-perennial stream, it is kept 1 or 2 m lower than the lowest bed level of the stream.

v) Discharges are rounded off as per standard practice.

vi) Runoff in mm is the notional depth of water in millimeters over the catchment, equivalent to annual runoff volume calculated at the discharge measurement station. It is computed using the relation:

$$\text{Runoff (mm)} = \frac{\text{Annual runoff } (Mm^3) \times 1000}{\text{Catchment area } (km^2)}$$

vii) Peak and lowest flow correspond to the highest and lowest water levels recorded from 'SWDES' entered data.

viii) Measuring Authority refers to the field division of Central Water Commission (Eastern Rivers Division) responsible for the operation of the gauging station.

ix) The gauging station code number is a unique seven column alphanumeric reference number which facilitates storage and retrieval of flow data in data base. The first column is identifier of either an integral river basin or, for the sake of convenience, a region having several contiguous river catchments. This is followed by a column which identifies an independent river system which either has one or more outlets to the sea or crosses international border to enter another country. The third, fourth and fifth column spaces denote first, second and third order tributaries, respectively, from the mouth upstream. The sixth and seventh column spaces indicate the location of the gauging station in one of the 225 slots earmarked on the river. The blank column spaces are filled by zero.

3. HYDROLOGICAL DATA

This volume contains the following information for each site stated above:

i. History Sheet: Site Name, State, District, River Basin, Tributary, Sub-Tributary, Catchment Area, Latitude / Longitude, Opening / Closing date for various types of data.

ii. Annual maximum/minimum discharge since period of observation.

iii. Daily Water level and observed/ computed discharge data including 10-daily, monthly and annual totals etc.

iv. Histogram and Hydrograph showing current year monthly mean discharges, Historical monthly mean discharges, historical monthly minimum and monthly maximum discharges.
v. Histogram showing Annual Run off volume since beginning of observation.
vi. Pie-Chart showing monthly mean run off (as percentage of Annual Run off) historical for the current year.
vii. Plot of Pre and Post Monsoon Cross-section of the rivers for current year.
viii. Water Level hydrograph for 3(three) major flood events of current year.

4. SEDIMENT DATA (In case of Sediment Observation sites)

The frequency of sediment observation is carried out daily during monsoon season and once in a week (on Monday) during the non-monsoon period. Data for non-observed days is estimated/ interpolated from the relationship of discharge v/s. sediment load, prepared on the basis of observed sediment concentration and weighted mean discharge of the same year.

Sediment samples are collected from 0.6 depth, using Punjab type bottle sampler, from all the verticals along the hydrological observation sections where velocity is observed for computation of discharge. The collected samples from all the segments are combined in 3 to 7 groups having compartments or groups of equal or nearly equal discharges for analysis. Quantum of suspended sediment load is estimated in three grades, viz. Coarse, Medium and Fine. Coarse and medium grades are separated by sieving process and the fine grade by filtration of left over samples after sieving through filter paper. Grade wise concentration is derived gravimetrically as per standard procedure. The following parameters are derived and recorded:

- Daily Observed suspended sediment (g/l).
- Corresponding discharge.
- Average sediment load in tonnes/day (10 daily & monthly basis).
- Annual sediment load for the current year.
- Annual & Seasonal sediment load and the corresponding volume of inflow for all the years since inception.
- Grain size distribution of bed load.

5. WATER QUALITY DATA (In case of Water Quality Observation sites)

The water samples are collected at a regular interval of once in a month for trend stations and once in two month for base stations (on 1st working day), from the main flowing segment of the stream just below the water surface (20 to 30 cm) on the Station Gauge line where depth of flow and velocity are maximum, preferably in the mid stream. The water samples are collected in the pre-rinsed and cleaned one-litre capacity polythene bottle having double stopper (inside and outside) facility. Sampling bottle is filled to its full capacity without entrapping air bubbles inside.

After sampling, the collected samples are sent to the Water Quality Laboratory (Level-II) based at Bhubaneswar (under the Eastern Rivers Division) and to Raipur laboratory (under Mahanadi Division, Burla), along with in-situ physical characteristics, for analysis. The samples received from the sites are preserved in a refrigerator in the water quality laboratories for analysis**.**

Analysis of parameters, namely pH, Electrical conductivity, Sodium, Potassium, Iron, Aluminum, Ammonia, Fluoride, Nitrate, Nitrite, Phosphate, Silicate, Boron, Sulphate, Calcium, Magnesium, Carbonate, Bi-carbonate, Chloride, Dissolved Oxygen, BOD and COD, are carried out at the Level II laboratory by using standard methodology. Micro biological parameters like total colliform and faecal colliform are also being analyzed. For analysis of trace and toxic elements, samples are sent to Level-II+ laboratory at Hyderabad once in a year, in the month of April.

The following parameters are analyzed and recorded:

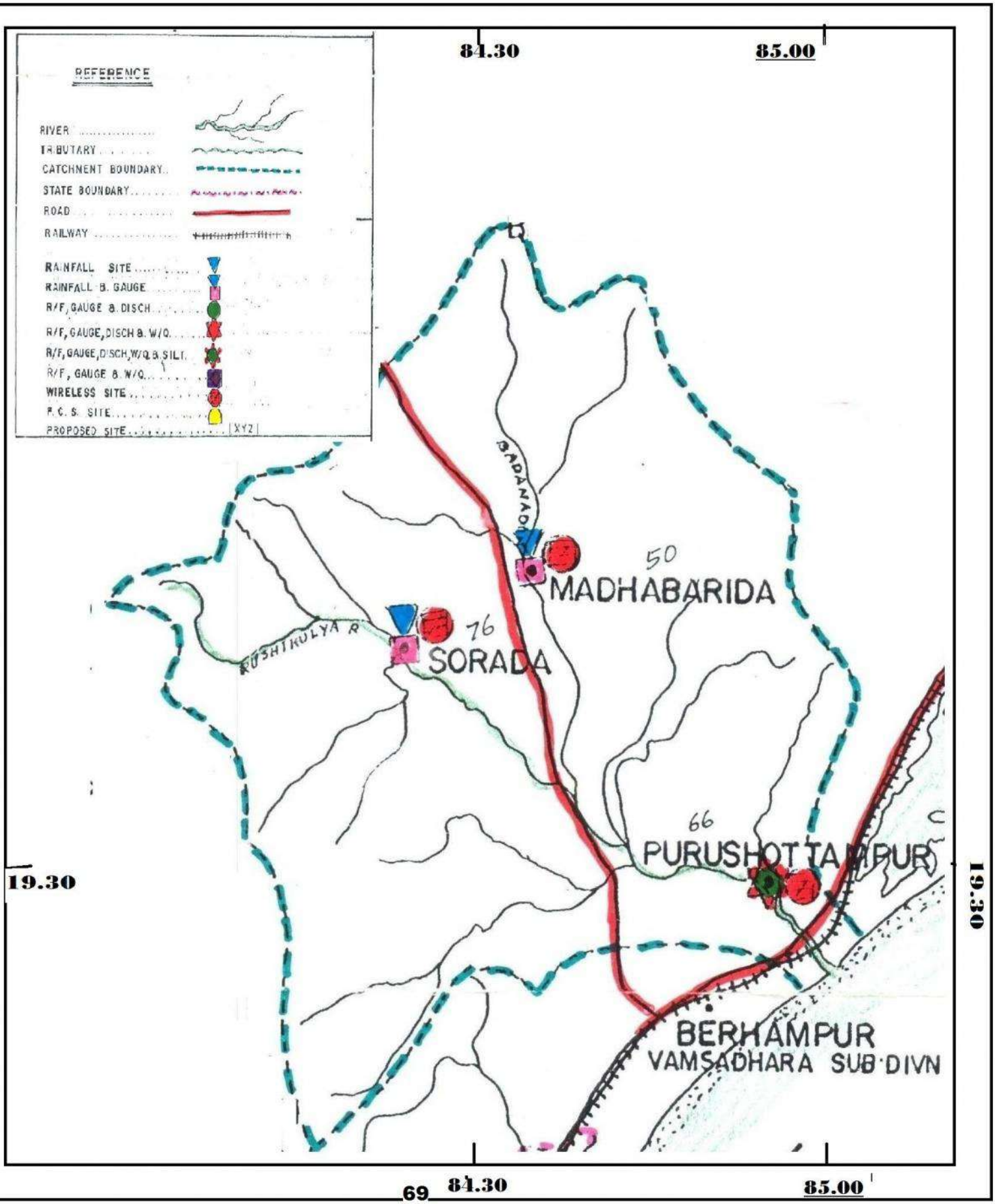
- Monthly Values: Physical; Chemical (mg/l); Biological (mg/l); Traces & Toxic (mg/l) and Chemical Indices.

- Average Values for the Year: 10 Years data to be given season wise averages:-

  - Average for Summer (March to June).
  - Average for Floods (July to October).
  - Average for Winter (November to February)

NAME OF THE SITES IN OPERATION UNDER RUSHIKULYA BASIN

Sl. No.	Station Name	River/ Tributary	Code No.	Type	Latitude	Longitude
1.	Madhabarida	Badanadi		G	19° 55' 00"	84° 38' 00"
2.	Purushottampur	Rushikulya	ER000U5	GDSQ	19° 31' 00"	84° 53' 00"
3.	Sorada	Rushikulya		G	19° 45' 30"	84° 38' 30"


REFERENCE
RIVER
TRIBUTARY
CATCHMENT BOUNDARY
STATE BOUNDARY
ROAD
RAILWAY
RAINFALL SITE
RAINFALL & GAUGE
R/F, GAUGE & DISCH
R/F, GAUGE, DISCH & W/Q
R/F, GAUGE, DISCH, W/Q & SILT
R/F, GAUGE & W/Q
WIRELESS SITE
P.C.S. SITE
PROPOSED SITE
XYZ
84.30
85.00
19.30
69
BADANADI
50
MADHABARIDA
RUSHIKULYA R
76
SORADA
66
PURUSHOTTAMPUR
BERHAMPUR
VAMSADHARA SUB DIVN

HISTORY SHEET

Water Year : 2016-2017

Site	**:**	**PURUSHOTTAMPUR**	**Code**	**:**	**ER000U5**
State	:	Orissa	District		Ganjam
Basin	:	EFR B Mahanadi-Godavari	Independent River	:	Rushikulya
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Rushikulya
Division	:	E.E., Bhubaneswar	Sub-Division	:	Behrampur
Drainage Area	:	7112 Sq. Km.	Bank	:	Right
Latitude	:	19°31'00"	Longitude	:	84°53'00"
Zero of Gauge (m)	:	12 (m.s.l)	7/14/1978	-	7/14/2078
		Opening Date	Closing Date		
Gauge	:	7/14/1978			
Discharge	:	6/14/1989			
Sediment	:	1/15/2001			
Water Quality	:	10/8/2001			

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1993-1994	800.0	14.990	8/1/1993	0.000	12.210	4/19/1994
1994-1995	2450	16.900	5/11/1995	0.000	12.120	4/2/1995
1995-1996	1910	17.120	11/10/1995	0.000	12.000	5/20/1996
1996-1997	758.1	15.460	10/3/1996	0.000	12.980	2/17/1997
1997-1998	2195	17.560	8/22/1997	0.000	12.000	6/15/1997
1998-1999	997.1	15.685	11/17/1998	0.000	13.070	4/13/1999
1999-2000	3020	17.760	10/19/1999	0.000	12.850	4/10/2000
2000-2001	609.8	15.345	8/29/2000	0.000	12.000	3/9/2001
2001-2002	1202	15.610	6/13/2001	0.000	12.990	4/22/2002
2002-2003	700.0	15.070	9/8/2002	0.000	12.000	5/7/2003
2003-2004	2279	17.940	10/8/2003	0.000	12.730	4/7/2004
2004-2005	1270	15.810	10/5/2004	0.000	12.000	4/2/2005
2005-2006	1648	16.530	9/13/2005	0.000	12.610	2/17/2006
2006-2007	2151	17.525	7/4/2006	0.000	12.730	2/27/2007
2007-2008	2086	17.500	8/7/2007	0.000	12.540	5/12/2008
2008-2009	1757	16.765	9/18/2008	0.328	12.770	2/17/2009
2009-2010	2260	17.250	7/20/2009	0.000	12.500	5/18/2010
2010-2011	2047	16.390	11/9/2010	0.000	12.570	6/22/2010
2011-2012	1004	15.360	9/1/2011	0.000	12.470	5/25/2012
2012-2013	1776	16.510	11/3/2012	0.000	12.270	5/16/2013
2013-2014	3750	18.640	10/25/2013	0.000	12.390	6/10/2013
2014-2015	1934	16.370	10/14/2014	0.561	12.040	6/23/2014
2015-2016	1225	15.190	9/16/2015	0.480	12.040	4/24/2016
2016-2017	798.2	14.310	10/8/2016	0.313	12.040	5/20/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	12.050	1.550	12.780	108.2	12.275	16.38	12.000	53.02	13.460	364.0	12.000	28.51
2	12.050	1.518	12.930	129.7	12.500	39.47	12.000	45.66	13.660	450.0 *	12.000	25.52
3	12.055	1.714	12.700	98.00 *	12.500	38.38	12.000	33.95	13.470	366.9	12.000	23.82
4	12.085	4.131	12.545	28.28	12.470	34.13	12.470	31.96 *	13.490	375.4	12.000	47.94
5	12.290		12.480	23.66	12.930	132.1	12.000	35.34	13.440	362.8	12.800	122.1
6	12.145	6.206	12.330	15.10	13.080	223.1	12.000	63.22	13.340	318.8	12.750	96.00 *
7	12.125	5.697	12.300	14.00 *	13.080	220.0 *	12.000	52.80	14.075	640.1	12.620	61.84
8	12.100	5.280	12.290	14.35	12.860	127.8	12.000	40.17	14.310	798.2	12.000	35.26
9	12.140	5.564	12.270	13.22	12.660	79.31	12.000	28.06	13.980	600.0 *	12.000	29.07
10	12.080	4.075	12.270	13.29 *	12.480	35.16	12.360	23.30	13.870	550.0 *	12.000	21.05
11	12.070	3.943	12.300	19.60	12.000	31.76	12.340	20.96 *	13.850	530.0 *	12.390	20.34
12	12.070	3.258 *	12.325	19.95	12.000	28.46	12.980	156.9	13.570	380.0 *	12.390	20.13
13	12.060	3.244	12.300	18.35	12.000	42.98	12.800	120.4 *	13.310	304.4	12.380	19.86 *
14	12.060	2.983	12.270	16.22	12.490	36.88 *	12.980	214.5	13.095	204.6	12.370	17.80 *
15	12.060	2.783	12.260	15.48	12.400	28.00 *	13.280	301.0	12.895	130.0	12.360	15.39
16	12.050	2.635	12.250	14.45	12.000	20.23	13.300	306.5	12.790	120.0 *	12.350	14.80
17	12.050	2.619	12.240	11.05 *	12.000	19.89	13.180	265.9	12.695	99.95	12.340	13.83
18	12.080	4.002	12.180	9.395	12.000	22.17	12.950	145.0 *	12.590	59.25	12.330	13.00
19	12.080		12.165	7.565	12.000	23.13	12.760	100.6	12.580	55.84	12.400	20.52
20	12.440	25.74	12.580	34.23	12.000	19.85	12.890	131.0	12.000	48.68	12.360	16.00 *
21	12.390	23.39	12.445	21.53	12.310	17.06 *	12.730	87.03	12.000	40.56	12.300	11.25
22	12.350	20.07	12.630	39.89	12.000	9.441	13.100	208.2	12.500	35.37	12.290	10.75
23	12.265	10.19	12.405	19.56	12.000	11.07	13.935	571.8	12.500	35.00 *	12.290	10.53
24	12.200	8.393	12.400	23.05 *	12.000	34.68	14.170	685.1	12.440	26.48	12.000	20.58
25	12.150	6.103	12.360	26.51	12.000	35.33	14.090	685.3 *	12.420	21.08	12.000	14.95
26	12.130	5.010 *	12.460	35.20	12.000	39.77	13.670	436.2	12.400	20.54	12.000	13.34
27	12.280	10.47	12.420	31.64	12.000	54.77	13.530	383.2	12.450	27.22	12.330	13.00 *
28	12.640	37.13	12.380	28.70	12.800	105.0 *	13.500	374.1	12.440	26.66	12.000	13.26
29	12.580	32.62	12.370	27.87	12.760	97.31	13.385	326.4	12.570	52.73	12.000	19.42
30	12.590	33.11	12.250	11.76	12.625	78.63	13.350	318.3	12.460	29.98 *	12.000	19.06
31			12.220	9.888 *	12.000	35.46			12.460	30.22		
Ten-Daily Mean												
I Ten-Daily	12.112	3.971	12.490	45.78	12.684	94.59	12.083	40.75	13.709	482.6	12.217	49.11
II Ten-Daily	12.102	5.689	12.287	16.63	12.089	27.34	12.946	176.3	12.938	193.3	12.367	17.17
III Ten-Daily	12.358	18.65	12.395	25.05	12.227	47.14	13.546	407.6	12.422	31.44	12.121	14.61
Monthly												
Min.	12.050	1.518	12.165	7.565	12.000	9.441	12.000	20.96	12.000	20.54	12.000	10.53
Max.	12.640	37.13	12.930	129.7	13.080	223.1	14.170	685.3	14.310	798.2	12.800	122.1
Mean	12.191	9.766	12.390	29.02	12.330	56.06	12.858	208.2	13.004	229.2	12.235	26.97

Annual Runoff in MCM = 1523 Annual Runoff in mm = 214

Peak Observed Discharge = 798.2 cumecs on 08/10/2016 Corres. Water Level :14.31 m

Lowest Observed Discharge = 0.313 cumecs on 20/05/2017 Corres. Water Level :12.04 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	12.330	13.23	12.120	3.500 *	12.130	2.128	12.080	0.569	12.100	1.124	12.050	0.644
2	12.300	11.95	12.130	4.410	12.120	2.114	12.080	0.561	12.090	0.990 *	12.050	0.665
3	12.300	11.89	12.130	4.388	12.120	2.102	12.080	0.543	12.090	0.969	12.070	0.788
4	12.300	11.00 *	12.130	4.287	12.110	1.949	12.080	0.545	12.090	0.935	12.060	0.672
5	12.290	10.94	12.130	4.237			12.080	0.536 *	12.080	0.892	12.060	0.664
6	12.290	10.79	12.130	4.264	12.110	1.939	12.070	0.514	12.080	0.880	12.060	0.618
7	12.280	9.986	12.130	4.266	12.110	1.959	12.070	0.511	12.080	0.886	12.050	0.480 *
8	12.280	9.692	12.130	4.500 *	12.110	1.802	12.070	0.516	12.120	2.129	12.040	0.342
9	12.270	9.113	12.130	4.633	12.110	1.790	12.070	0.509	12.120	2.127 *	12.040	0.347
10	12.270	9.051	12.130	4.671	12.110	1.807	12.060	0.477	12.120	2.099	12.040	0.561 *
11	12.270	9.000 *	12.130	3.889	12.110	1.784	12.060	0.469	12.120	2.160	12.060	0.561
12	12.260	9.500 *	12.120	3.964			12.080	0.536 *	12.120	2.199	12.060	0.559
13	12.260	9.875	12.120	3.889	12.110	1.797	12.110	1.800 *	12.080	0.845	12.060	0.540
14	12.250	9.262	12.120	3.822	12.140	3.011	12.150	4.958	12.080	0.830 *	12.050	0.450 *
15	12.240	8.814	12.120	3.800 *	12.130	2.986	12.150	4.788	12.070	0.795	12.050	0.458
16	12.240	8.532	12.120	3.803	12.130	2.924	12.150	4.882	12.070	0.815 *	12.050	0.471
17	12.230	8.373	12.120	3.735	12.140	3.332	12.150	4.856	12.070	0.809	12.050	0.452
18	12.230	8.500 *	12.120	3.670	12.140	3.337	12.150	4.820	12.070	0.806	12.050	0.464
19	12.220	7.926	12.120	3.747	12.140	3.300	12.150	4.500 *	12.060	0.752	12.040	0.343
20	12.220	7.904	12.120	3.730	12.140	3.288	12.120	5.135	12.060	0.753	12.040	0.313
21	12.220	7.950	12.120	3.725	12.140	3.243	12.120	1.737	12.060	0.752	12.040	0.550 *
22	12.220	7.934	12.120	3.700 *	12.140	3.196	12.110	1.738	12.050	0.631	12.080	0.883
23	12.210	7.782	12.120	3.714	12.140	3.212	12.110	1.708	12.050	0.715 *	12.080	0.851
24	12.210	7.700	12.120	3.672	12.140	3.010 *	12.100	1.699	12.060	0.788	12.080	0.856
25	12.180	4.931 *	12.120	3.688	12.140	3.294	12.100	1.703	12.060	0.795	12.080	0.884
26	12.160	4.936	12.120	3.600 *	12.100	1.045 *	12.110	1.700 *	12.060	0.785	12.080	0.862
27	12.150	4.712	12.120	3.636	12.080	0.577	12.120	2.635	12.060	0.782	12.120	1.037
28	12.140	4.430	12.120	3.607	12.080	0.555 *	12.130	2.850	12.060	0.683	12.100	1.005 *
29	12.120	3.861	12.130	4.330 *			12.130	2.806	12.050	0.674	12.090	0.973
30	12.120	3.827	12.130	4.283			12.120	2.713	12.050	0.675 *	12.120	1.297
31	12.120	3.879	12.130	4.251			12.120	2.680			12.110	1.268
Ten-Daily Mean												
I Ten-Daily	12.291	10.76	12.129	4.316	12.114	1.954	12.074	0.528	12.097	1.303	12.052	0.578
II Ten-Daily	12.242	8.769	12.121	3.805	12.131	2.862	12.127	3.674	12.080	1.076	12.051	0.461
III Ten-Daily	12.168	5.631	12.123	3.837	12.120	2.266	12.115	2.179	12.056	0.728	12.089	0.951
Monthly												
Min.	12.120	3.827	12.120	3.500	12.080	0.555	12.060	0.469	12.050	0.631	12.040	0.313
Max.	12.330	13.23	12.130	4.671	12.140	3.337	12.150	5.135	12.120	2.199	12.120	1.297
Mean	12.232	8.299	12.124	3.981	12.122	2.365	12.106	2.129	12.078	1.036	12.065	0.673

Peak Computed Discharge = 685.3 cumecs on 25/09/2016 Corres. Water Level :14.09 m

Lowest Computed Discharge = 0.450 cumecs on 14/05/2017 Corres. Water Level :12.05 m

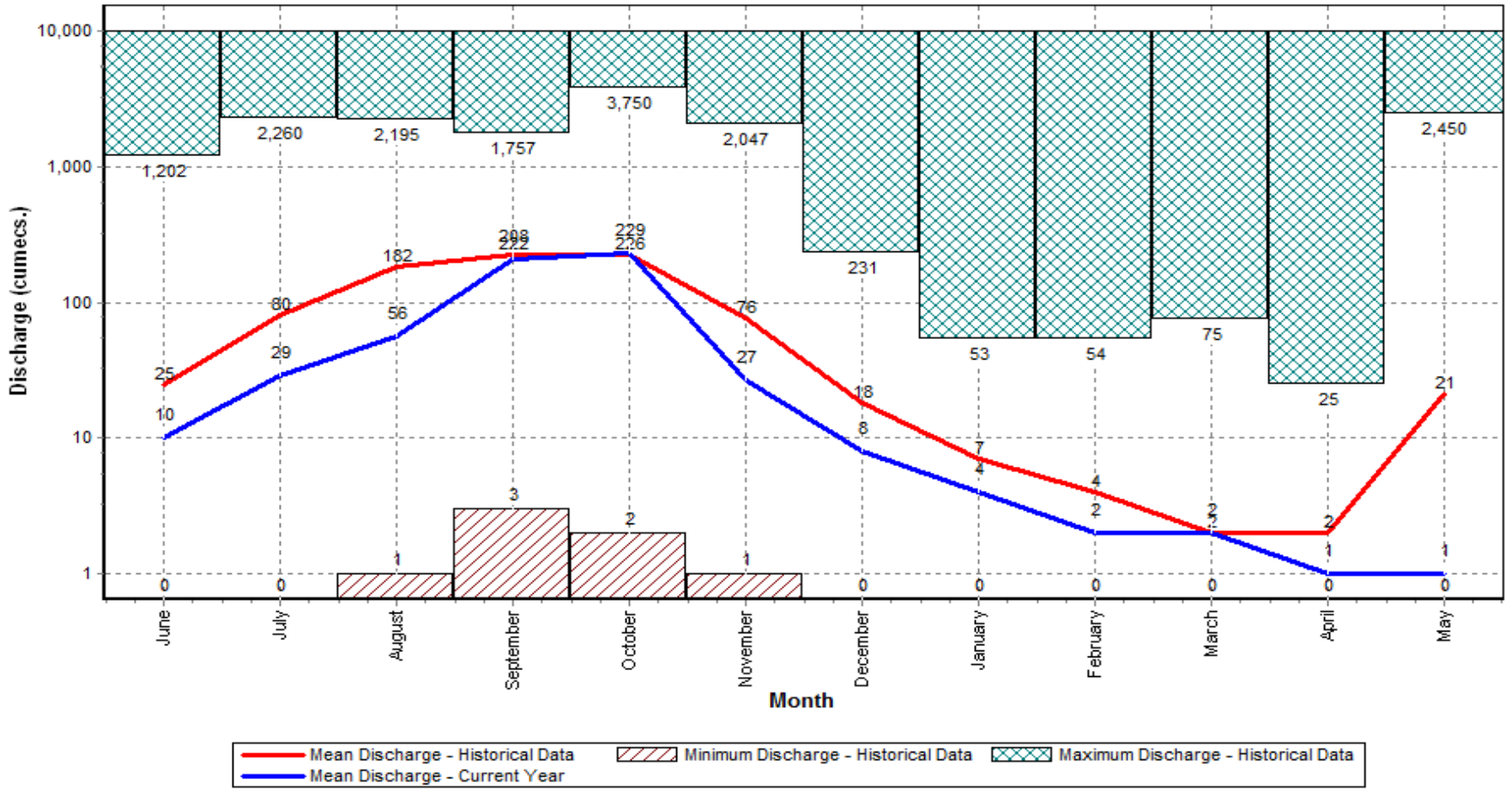
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

HISTOGRAM - HYDROGRAPH for Water Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Data considered : 1993-2017** **Division : E.E., Bhubaneswar**

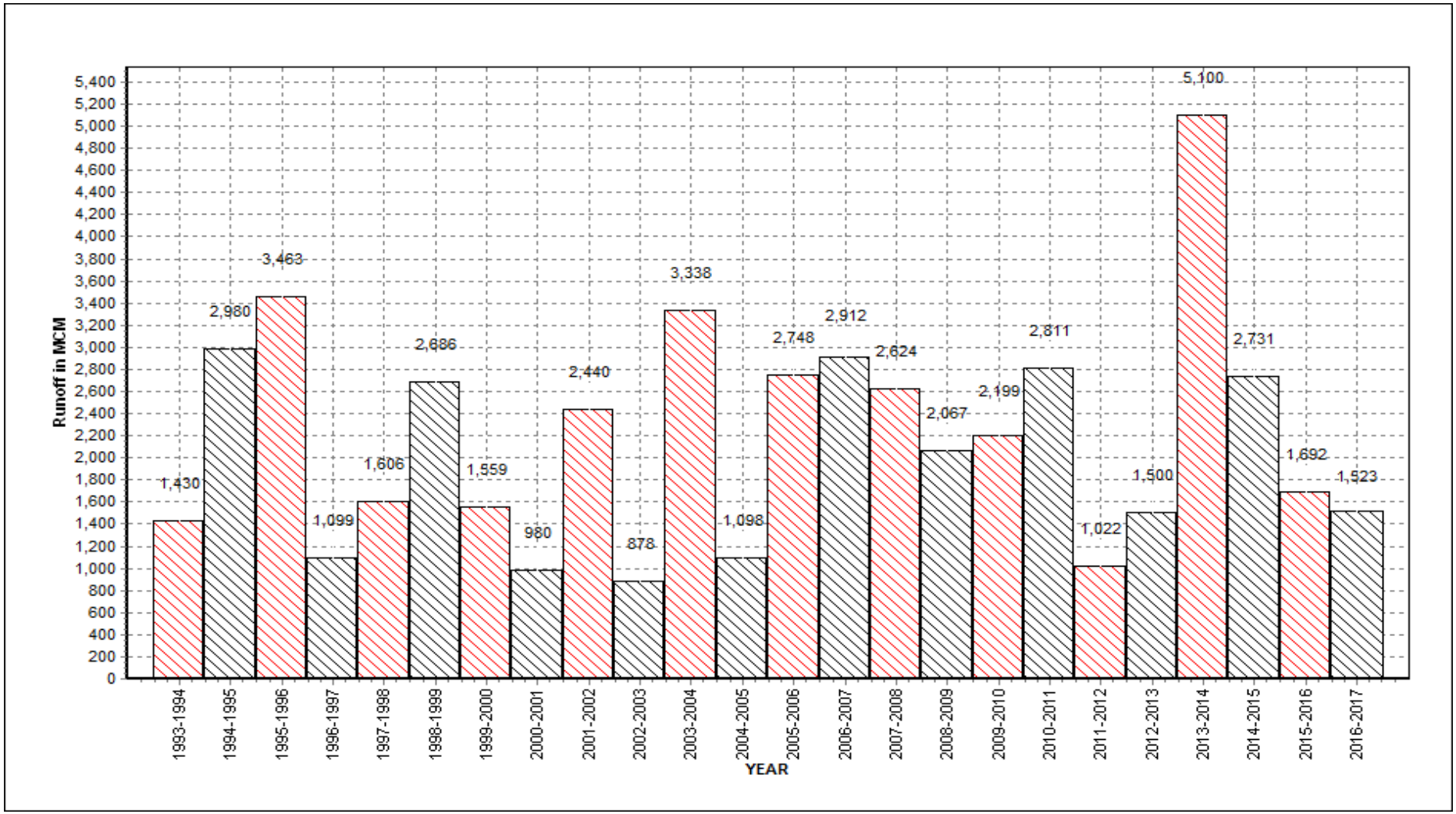
Local River : Rushikulya **Sub-Division : Behrampur**



Annual Runoff Values for the period: 1993 - 2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

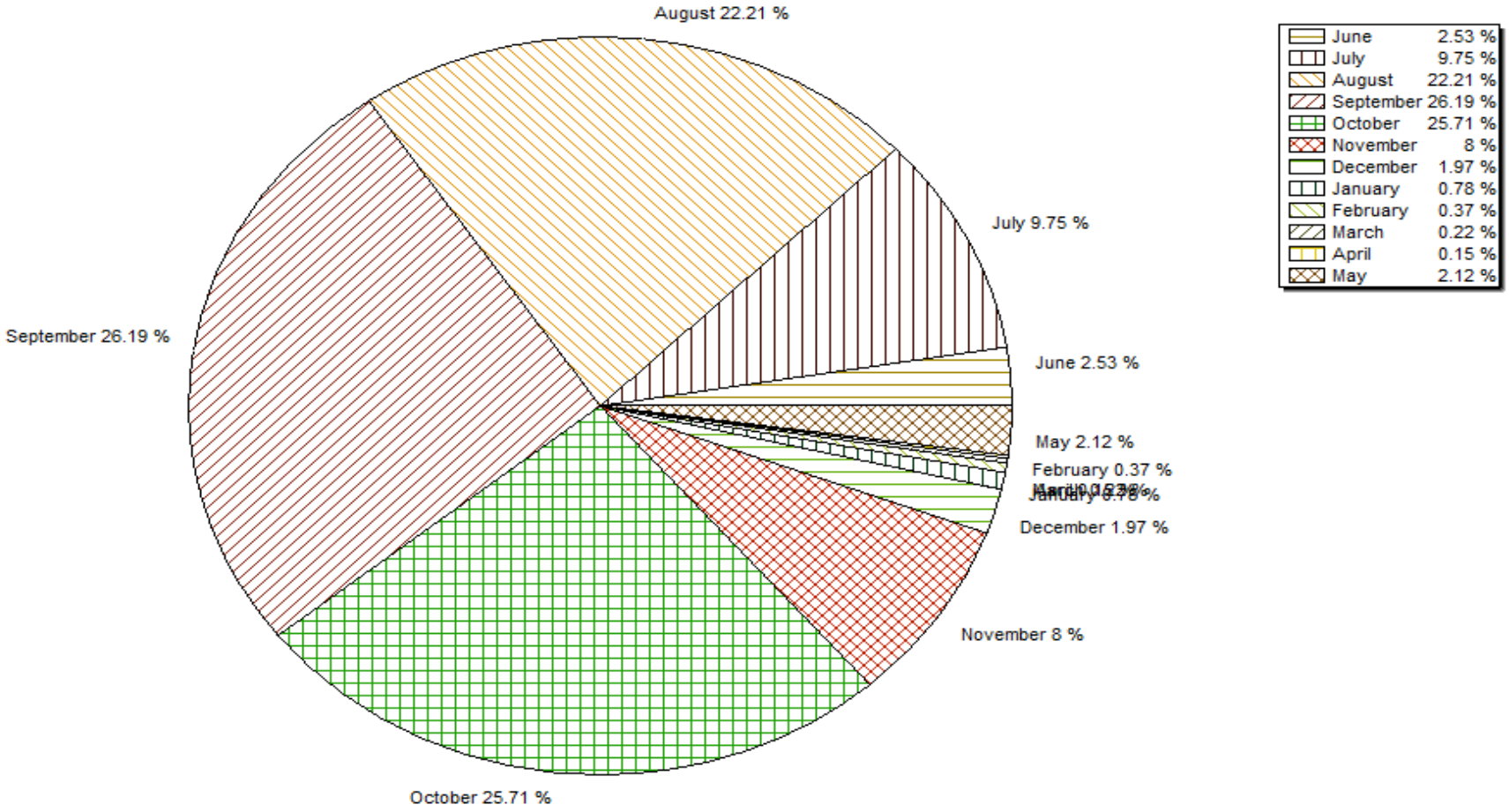


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period : 1993-2016

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

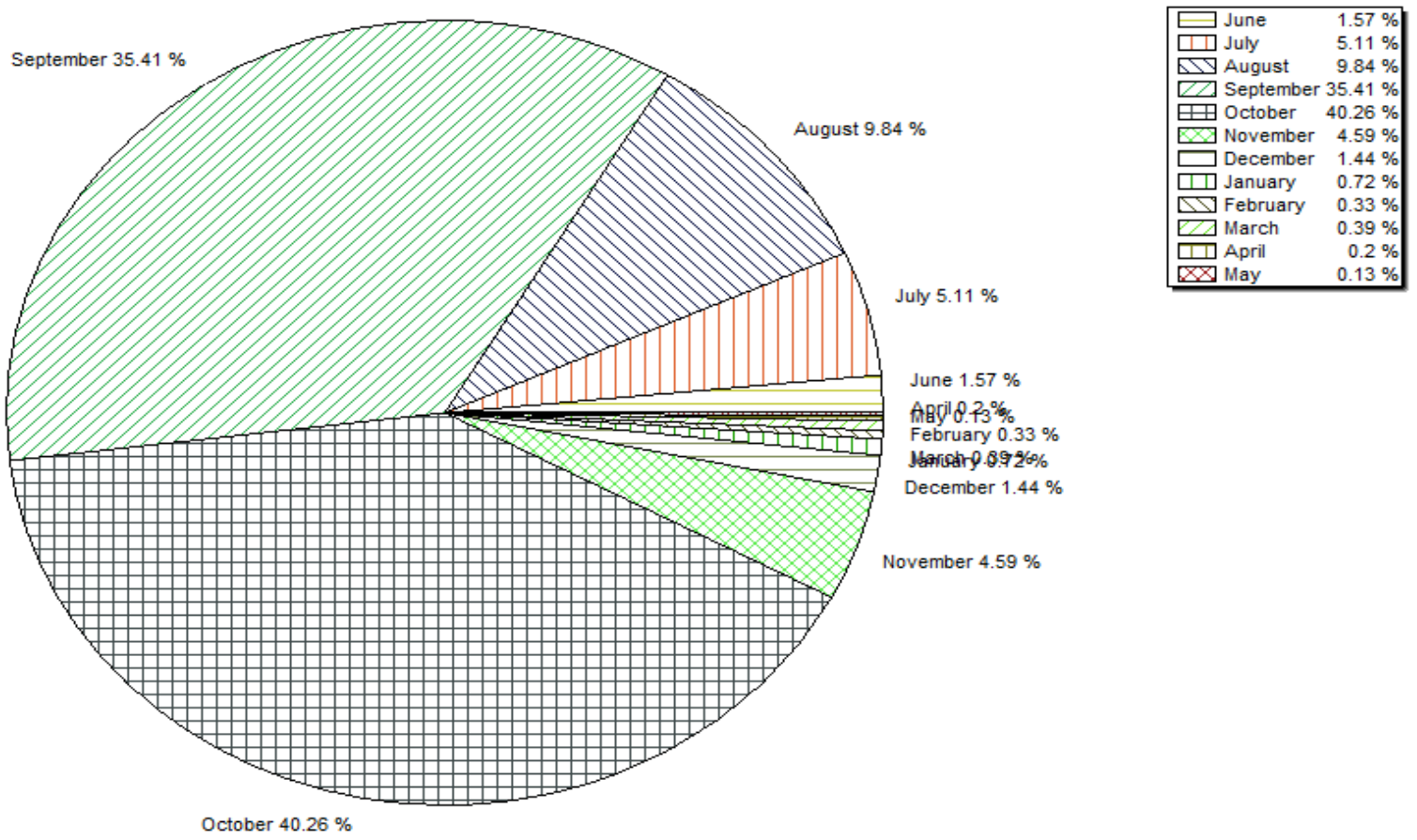
Local River : Rushikulya **Sub-Division : Behrampur**



Monthly Runoff for the Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

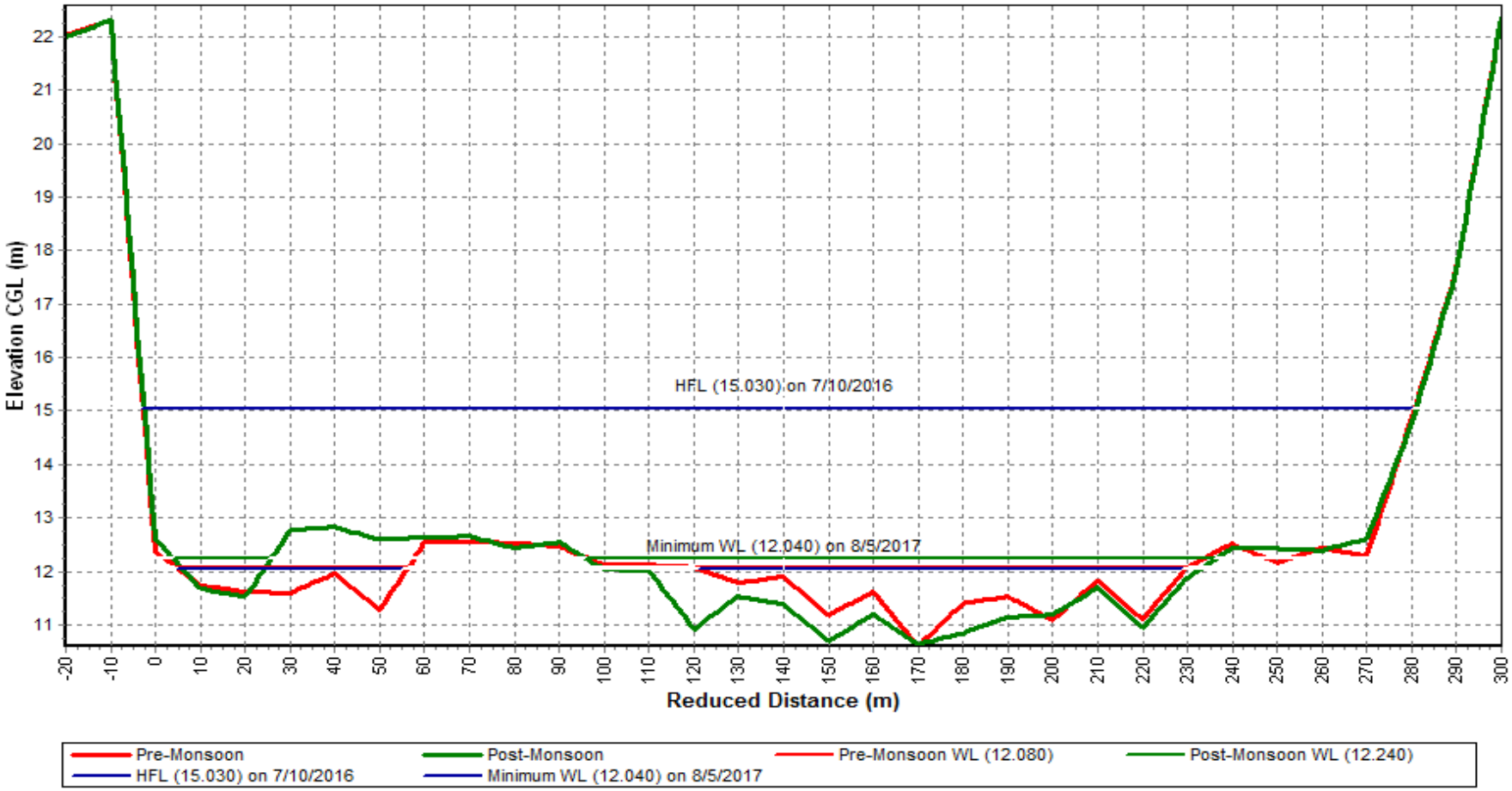
Local River : Rushikulya **Sub-Division : Behrampur**



Pre-Monsoon & Post-Monsoon X-Section for Water Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

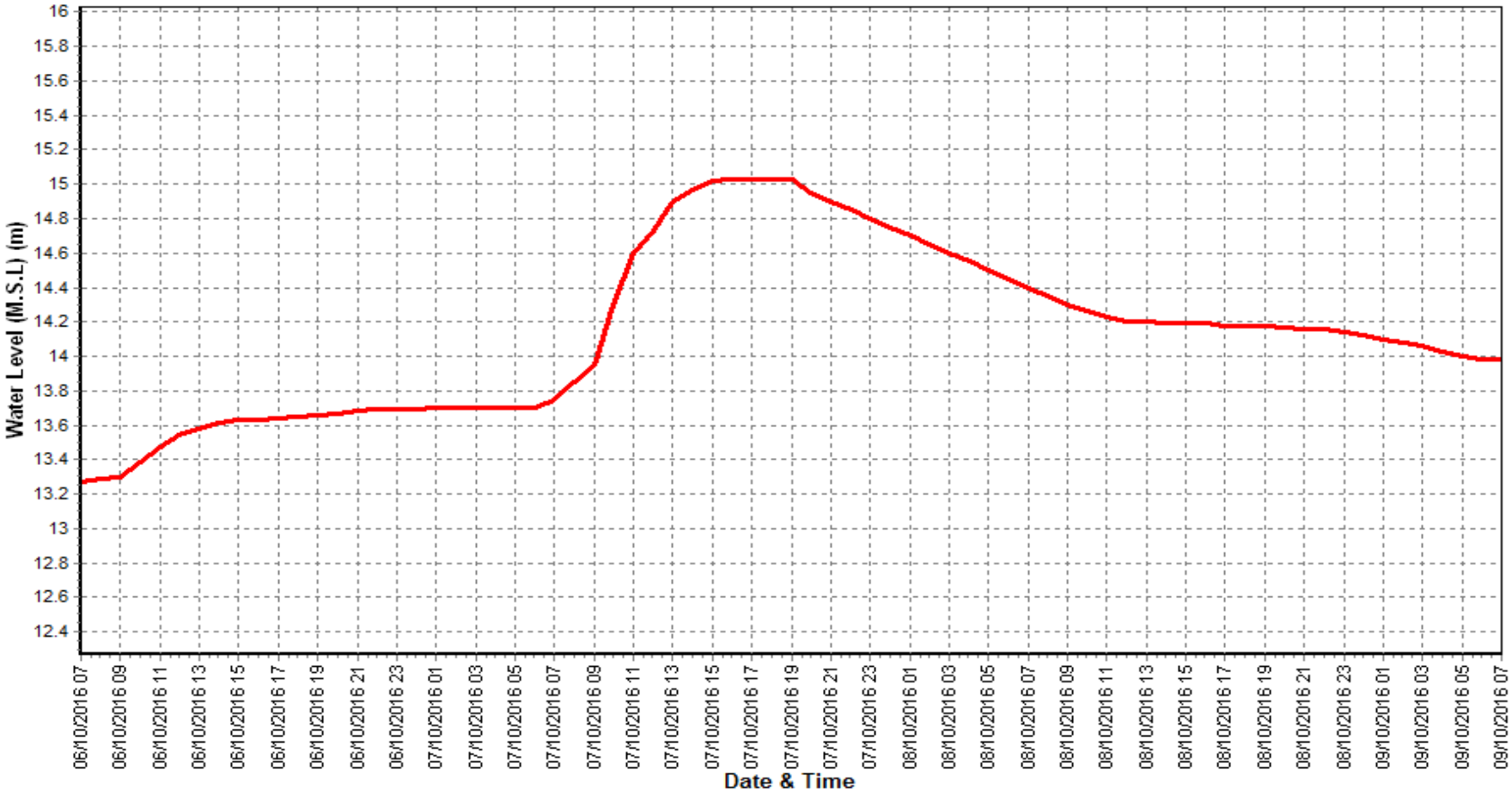
Local River : Rushikulya **Sub-Division : Behrampur**



Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

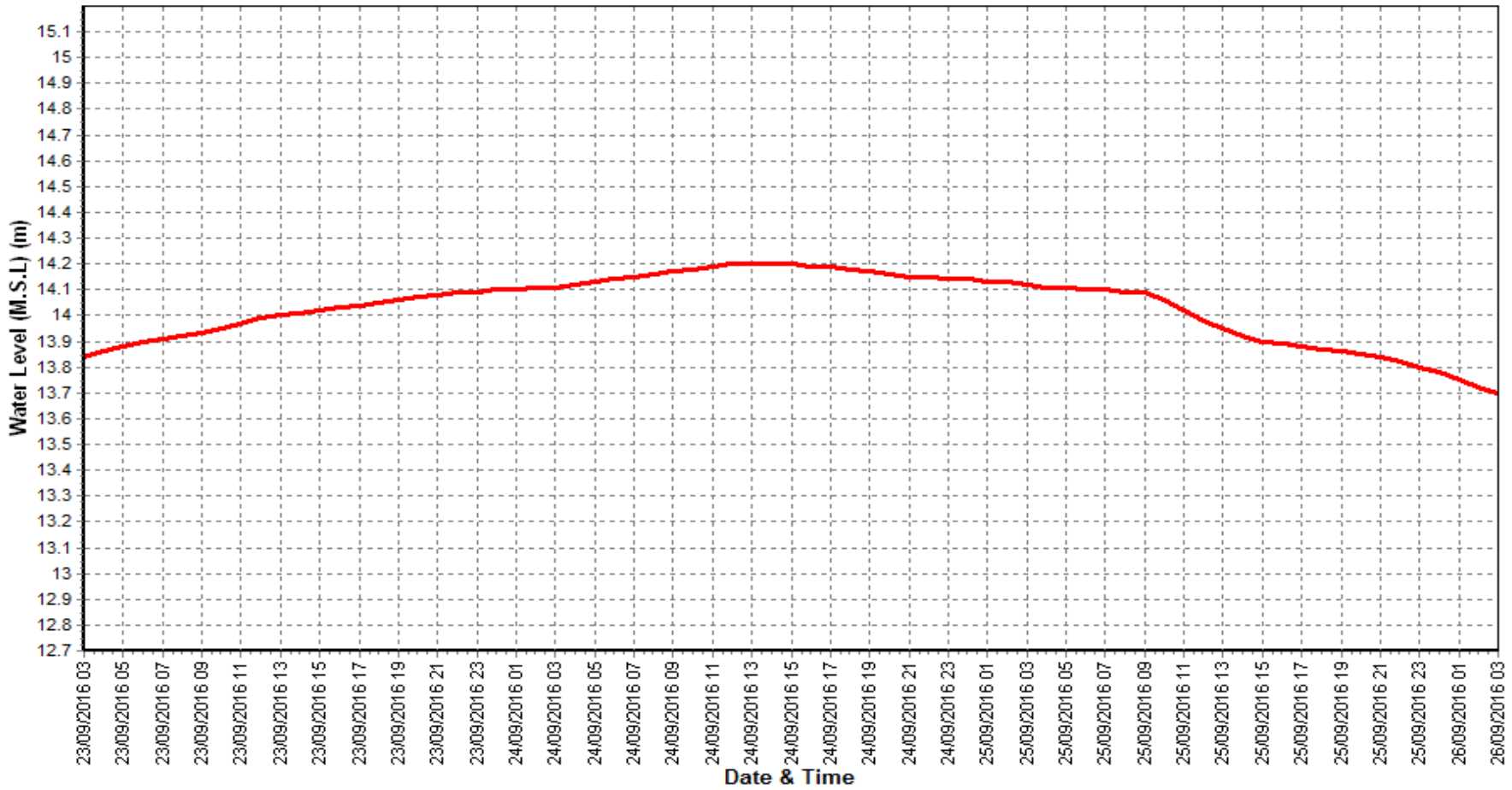


Time Span: 72 Hrs

Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

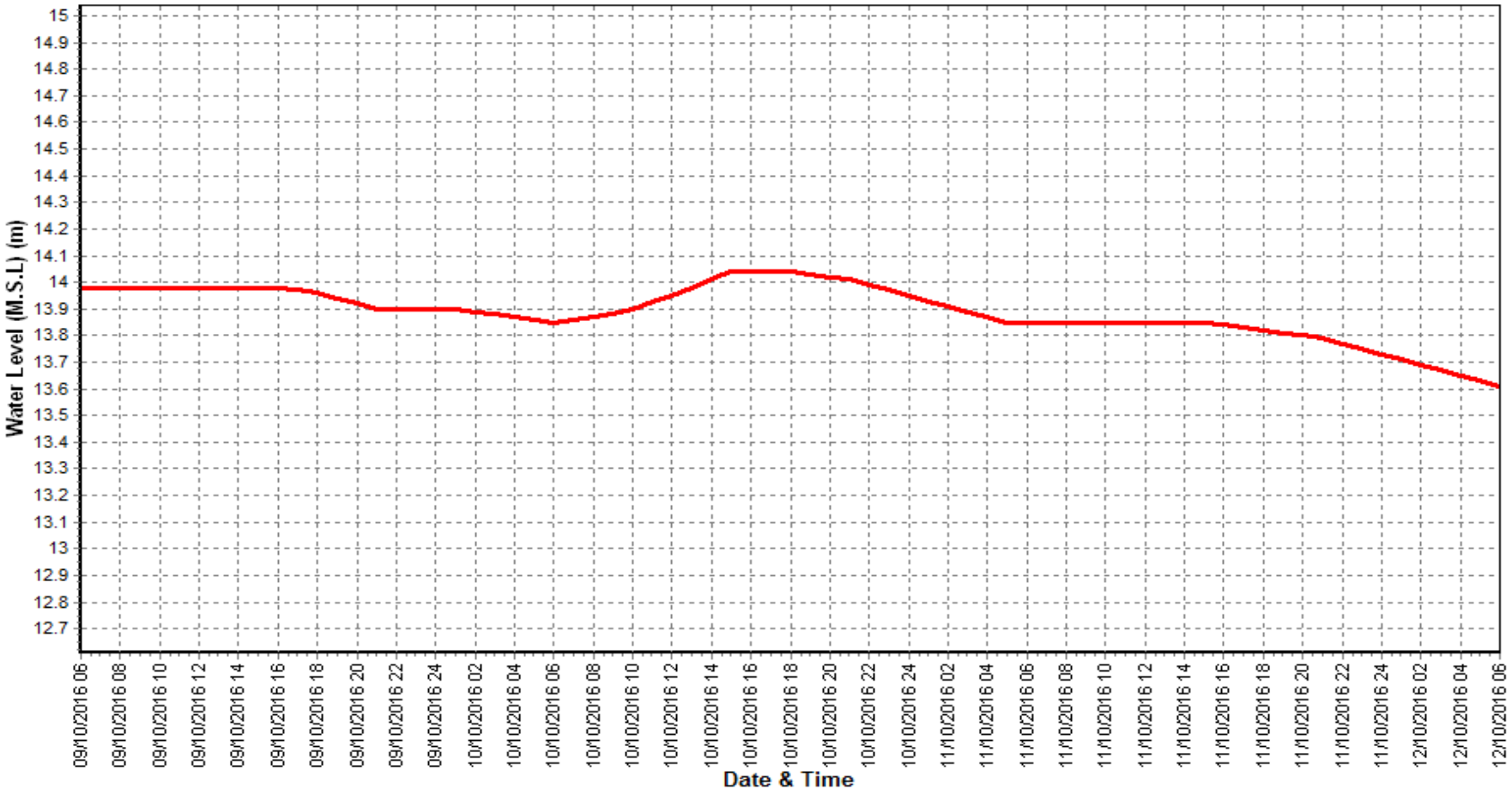


Time Span: 72 Hrs

Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**



Time Span: 72 Hrs

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Jun						Jul						Aug					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	1.550	0.000	0.000	0.048	0.048	6	108.2	0.000	0.000	0.242	0.242	2261	16.38	0.000	0.000	0.128	0.128	181
2	1.518	0.000	0.000	0.051	0.051	7	129.7	0.000	0.000	0.238	0.238	2671	39.47	0.000	0.000	0.159	0.159	542
3	1.714	0.000	0.000	0.053	0.053	8	98.00	0.000	0.000	0.000	0.000	0	38.38	0.000	0.000	0.211	0.211	699
4	4.131	0.000	0.000	0.116	0.116	41	28.28	0.000	0.000	0.285	0.285	696	34.13	0.000	0.000	0.276	0.276	814
5		0.000	0.000				23.66	0.000	0.000	0.186	0.186	380	132.1	0.000	0.000	0.236	0.236	2694
6	6.206	0.000	0.000	0.102	0.102	55	15.10	0.000	0.000	0.423	0.423	551	223.1	0.000	0.000	0.355	0.355	6840
7	5.697	0.000	0.000	0.080	0.080	39	14.00	0.000	0.000	0.000	0.000	0	220.0	0.000	0.000	0.000	0.000	0
8	5.280	0.000	0.000	0.092	0.092	42	14.35	0.000	0.000	0.056	0.056	69	127.8	0.000	0.000	0.278	0.278	3070
9	5.564	0.000	0.000	0.035	0.035	17	13.22	0.000	0.000	0.111	0.111	126	79.31	0.000	0.000	0.175	0.175	1202
10	4.075	0.000	0.000	0.081	0.081	29	13.29	0.000	0.000	0.000	0.000	0	35.16	0.000	0.000	0.167	0.167	507
11	3.943	0.000	0.000	0.069	0.069	24	19.60	0.000	0.000	0.028	0.028	48	31.76	0.000	0.000	0.197	0.197	539
12	3.258	0.000	0.000				19.95	0.000	0.000	0.055	0.055	94	28.46	0.000	0.000	0.150	0.150	369
13	3.244	0.000	0.000	0.044	0.044	12	18.35	0.000	0.000	0.063	0.063	99	42.98	0.000	0.000	0.109	0.109	404
14	2.983	0.000	0.000	0.041	0.041	11	16.22	0.000	0.000	0.044	0.044	61	36.88	0.000	0.000	0.000	0.000	0
15	2.783	0.000	0.000	0.076	0.076	18	15.48	0.000	0.000	0.026	0.026	35	28.00	0.000	0.000	0.000	0.000	0
16	2.635	0.000	0.000	0.039	0.039	9	14.45	0.000	0.000	0.102	0.102	127	20.23	0.000	0.000	0.099	0.099	172
17	2.619	0.000	0.000	0.060	0.060	14	11.05	0.000	0.000	0.000	0.000	0	19.89	0.000	0.000	0.146	0.146	250
18	4.002	0.000	0.000	0.126	0.126	43	9.395	0.000	0.000	0.047	0.047	38	22.17	0.000	0.000	0.148	0.148	283
19		0.000	0.000				7.565	0.000	0.000	0.088	0.088	57	23.13	0.000	0.000	0.120	0.120	240
20	25.74	0.000	0.000	0.338	0.338	752	34.23	0.000	0.000	0.338	0.338	998	19.85	0.000	0.000	0.169	0.169	290
21	23.39	0.000	0.000	0.344	0.344	695	21.53	0.000	0.000	0.410	0.410	762	17.06	0.000	0.000	0.000	0.000	0
22	20.07	0.000	0.000	0.289	0.289	502	39.89	0.000	0.000	0.305	0.305	1051	9.441	0.000	0.000	0.080	0.080	65
23	10.19	0.000	0.000	0.140	0.140	123	19.56	0.000	0.000	0.165	0.165	278	11.07	0.000	0.000	0.129	0.129	124
24	8.393	0.000	0.000	0.099	0.099	71	23.05	0.000	0.000	0.000	0.000	0	34.68	0.000	0.000	0.117	0.117	350
25	6.103	0.000	0.000	0.079	0.079	42	26.51	0.000	0.000	0.225	0.225	516	35.33	0.000	0.000	0.170	0.170	517
26	5.010	0.000	0.000				35.20	0.000	0.000	0.274	0.274	834	39.77	0.000	0.000	0.139	0.139	476
27	10.47	0.000	0.000	0.093	0.093	84	31.64	0.000	0.000	0.190	0.190	519	54.77	0.000	0.000	0.267	0.267	1262
28	37.13	0.000	0.000	0.175	0.175	560	28.70	0.000	0.000	0.143	0.143	355	105.0	0.000	0.000	0.000	0.000	0
29	32.62	0.000	0.000	0.214	0.214	602	27.87	0.000	0.000	0.370	0.370	891	97.31	0.000	0.000	0.122	0.122	1027
30	33.11	0.000	0.000	0.207	0.207	592	11.76	0.000	0.000	0.195	0.195	198	78.63	0.000	0.000	0.077	0.077	521
31							9.888	0.000	0.000	0.000	0.000	0	35.46	0.000	0.000	0.188	0.188	577
Ten Daily Mean																		
Ten Daily I	3.971	0.000	0.000	0.073	0.073	27	45.78	0.000	0.000	0.154	0.154	675	94.59	0.000	0.000	0.198	0.198	1655
Ten Daily II	5.689	0.000	0.000	0.099	0.099	110	16.63	0.000	0.000	0.079	0.079	156	27.34	0.000	0.000	0.114	0.114	255
Ten Daily III	18.65	0.000	0.000	0.182	0.182	363	25.05	0.000	0.000	0.207	0.207	491	47.14	0.000	0.000	0.117	0.117	447
Monthly																		
Total						4397						13717						24015

Annual Sediment Load (Metric Tonnes) : 257849

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Sep						Oct						Nov					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	53.02	0.000	0.000	0.153	0.153	702	364.0	0.000	0.000	0.119	0.119	3736	28.51	0.000	0.000	0.007	0.007	17
2	45.66	0.000	0.000	0.112	0.112	441	450.0	0.000	0.000	0.000	0.000	0	25.52	0.000	0.000	0.005	0.005	10
3	33.95	0.000	0.000	0.081	0.081	238	366.9	0.000	0.000	0.420	0.420	13322	23.82	0.000	0.000	0.007	0.007	13
4	31.96	0.000	0.000	0.000	0.000	0	375.4	0.000	0.000	0.154	0.154	4989	47.94	0.000	0.000	0.004	0.004	14
5	35.34	0.000	0.000	0.131	0.131	398	362.8	0.000	0.000	0.136	0.136	4276	122.1	0.000	0.000	0.019	0.019	202
6	63.22	0.000	0.000	0.231	0.231	1259	318.8	0.000	0.000	0.237	0.237	6536	96.00	0.000	0.000	0.000	0.000	0
7	52.80	0.000	0.000	0.180	0.180	822	640.1	0.000	0.000	0.199	0.199	10995	61.84	0.000	0.000	0.007	0.007	36
8	40.17	0.000	0.000	0.158	0.158	547	798.2	0.000	0.000	0.307	0.307	21193	35.26	0.000	0.000	0.003	0.003	8
9	28.06	0.000	0.000	0.197	0.197	477	600.0	0.000	0.000	0.000	0.000	0	29.07	0.000	0.000	0.004	0.004	10
10	23.30	0.000	0.000	0.082	0.082	166	550.0	0.000	0.000	0.000	0.000	0	21.05	0.000	0.000	0.026	0.026	47
11	20.96	0.000	0.000	0.000	0.000	0	530.0	0.000	0.000	0.000	0.000	0	20.34	0.000	0.000	0.008	0.008	14
12	156.9	0.000	0.000	0.261	0.261	3543	380.0	0.000	0.000	0.000	0.000	0	20.13	0.000	0.000	0.012	0.012	21
13	120.4	0.000	0.000	0.000	0.000	0	304.4	0.000	0.000	0.134	0.134	3514	19.86	0.000	0.000	0.000	0.000	0
14	214.5	0.000	0.000	0.269	0.269	4984	204.6	0.000	0.000	0.114	0.114	2015	17.80	0.000	0.000	0.000	0.000	0
15	301.0	0.000	0.000	0.255	0.255	6634	130.0	0.000	0.000	0.158	0.158	1772	15.39	0.000	0.000	0.013	0.013	17
16	306.5	0.000	0.000	0.263	0.263	6959	120.0	0.000	0.000	0.000	0.000	0	14.80	0.000	0.000	0.011	0.011	14
17	265.9	0.000	0.000	0.504	0.504	11569	99.95	0.000	0.000	0.187	0.187	1618	13.83	0.000	0.000	0.007	0.007	9
18	145.0	0.000	0.000	0.000	0.000	0	59.25	0.000	0.000	0.072	0.072	367	13.00	0.000	0.000	0.019	0.019	22
19	100.6	0.000	0.000	0.313	0.313	2723	55.84	0.000	0.000	0.146	0.146	702	20.52	0.000	0.000	0.022	0.022	38
20	131.0	0.000	0.000	0.170	0.170	1928	48.68	0.000	0.000	0.053	0.053	224	16.00	0.000	0.000	0.000	0.000	0
21	87.03	0.000	0.000	0.240	0.240	1804	40.56	0.000	0.000	0.033	0.033	117	11.25	0.000	0.000	0.011	0.011	10
22	208.2	0.000	0.000	0.139	0.139	2502	35.37	0.000	0.000	0.030	0.030	91	10.75	0.000	0.000	0.017	0.017	16
23	571.8	0.000	0.000	0.414	0.414	20427	35.00	0.000	0.000	0.000	0.000	0	10.53	0.000	0.000	0.008	0.008	7
24	685.1	0.000	0.000	0.511	0.511	30231	26.48	0.000	0.000	0.094	0.094	214	20.58	0.000	0.000	0.009	0.009	15
25	685.3	0.000	0.000	0.000	0.000	0	21.08	0.000	0.000	0.032	0.032	58	14.95	0.000	0.000	0.011	0.011	15
26	436.2	0.000	0.000	0.143	0.143	5389	20.54	0.000	0.000	0.054	0.054	96	13.34	0.000	0.000	0.022	0.022	26
27	383.2	0.000	0.000	0.196	0.196	6499	27.22	0.000	0.000	0.029	0.029	68	13.00	0.000	0.000	0.000	0.000	0
28	374.1	0.000	0.000	0.336	0.336	10863	26.66	0.000	0.000	0.037	0.037	85	13.26	0.000	0.000	0.013	0.013	15
29	326.4	0.000	0.000	0.402	0.402	11346	52.73	0.000	0.000	0.127	0.127	578	19.42	0.000	0.000	0.020	0.020	33
30	318.3	0.000	0.000	0.214	0.214	5889	29.98	0.000	0.000	0.000	0.000	0	19.06	0.000	0.000	0.020	0.020	32
31							30.22	0.000	0.000	0.026	0.026	68						
Ten Daily Mean																		
Ten Daily I	40.75	0.000	0.000	0.132	0.132	505	482.6	0.000	0.000	0.157	0.157	6505	49.11	0.000	0.000	0.008	0.008	36
Ten Daily II	176.3	0.000	0.000	0.204	0.204	3834	193.3	0.000	0.000	0.086	0.086	1021	17.17	0.000	0.000	0.009	0.009	13
Ten Daily III	407.6	0.000	0.000	0.260	0.260	9495	31.44	0.000	0.000	0.042	0.042	125	14.61	0.000	0.000	0.013	0.013	17
Monthly																		
Total						138340						76634						660

Annual Sediment Load (Metric Tonnes) : 257849

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Dec						Jan						Feb					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	13.23	0.000	0.000	0.000	0.000	0	3.500	0.000	0.000	0.000	0.000	0	2.128	0.000	0.000	0.000	0.000	0
2	11.95	0.000	0.000	0.000	0.000	0	4.410	0.000	0.000	0.002	0.002	1	2.114	0.000	0.000	0.000	0.000	0
3	11.89	0.000	0.000	0.000	0.000	0	4.388	0.000	0.000	0.000	0.000	0	2.102	0.000	0.000	0.000	0.000	0
4	11.00	0.000	0.000	0.000	0.000	0	4.287	0.000	0.000	0.000	0.000	0	1.949	0.000	0.000	0.000	0.000	0
5	10.94	0.000	0.000	0.018	0.018	17	4.237	0.000	0.000	0.000	0.000	0						
6	10.79	0.000	0.000	0.000	0.000	0	4.264	0.000	0.000	0.000	0.000	0	1.939	0.000	0.000	0.000	0.000	0
7	9.986	0.000	0.000	0.000	0.000	0	4.266	0.000	0.000	0.000	0.000	0	1.959	0.000	0.000	0.000	0.000	0
8	9.692	0.000	0.000	0.000	0.000	0	4.500	0.000	0.000	0.000	0.000	0	1.802	0.000	0.000	0.000	0.000	0
9	9.113	0.000	0.000	0.000	0.000	0	4.633	0.000	0.000	0.002	0.002	1	1.790	0.000	0.000	0.000	0.000	0
10	9.051	0.000	0.000	0.000	0.000	0	4.671	0.000	0.000	0.000	0.000	0	1.807	0.000	0.000	0.000	0.000	0
11	9.000	0.000	0.000	0.000	0.000	0	3.889	0.000	0.000	0.000	0.000	0	1.784	0.000	0.000	0.000	0.000	0
12	9.500	0.000	0.000	0.000	0.000	0	3.964	0.000	0.000	0.000	0.000	0						
13	9.875	0.000	0.000	0.005	0.005	4	3.889	0.000	0.000	0.000	0.000	0	1.797	0.000	0.000	0.000	0.000	0
14	9.262	0.000	0.000	0.000	0.000	0	3.822	0.000	0.000	0.000	0.000	0	3.011	0.000	0.000	0.000	0.000	0
15	8.814	0.000	0.000	0.000	0.000	0	3.800	0.000	0.000	0.000	0.000	0	2.986	0.000	0.000	0.000	0.000	0
16	8.532	0.000	0.000	0.000	0.000	0	3.803	0.000	0.000	0.002	0.002	1	2.924	0.000	0.000	0.000	0.000	0
17	8.373	0.000	0.000	0.000	0.000	0	3.735	0.000	0.000	0.000	0.000	0	3.332	0.000	0.000	0.000	0.000	0
18	8.500	0.000	0.000	0.000	0.000	0	3.670	0.000	0.000	0.000	0.000	0	3.337	0.000	0.000	0.000	0.000	0
19	7.926	0.000	0.000	0.004	0.004	3	3.747	0.000	0.000	0.000	0.000	0	3.300	0.000	0.000	0.000	0.000	0
20	7.904	0.000	0.000	0.000	0.000	0	3.730	0.000	0.000	0.000	0.000	0	3.288	0.000	0.000	0.000	0.000	0
21	7.950	0.000	0.000	0.000	0.000	0	3.725	0.000	0.000	0.000	0.000	0	3.243	0.000	0.000	0.000	0.000	0
22	7.934	0.000	0.000	0.000	0.000	0	3.700	0.000	0.000	0.000	0.000	0	3.196	0.000	0.000	0.000	0.000	0
23	7.782	0.000	0.000	0.000	0.000	0	3.714	0.000	0.000	0.002	0.002	1	3.212	0.000	0.000	0.000	0.000	0
24	7.700	0.000	0.000	0.000	0.000	0	3.672	0.000	0.000	0.000	0.000	0	3.010	0.000	0.000	0.000	0.000	0
25	4.931	0.000	0.000	0.000	0.000	0	3.688	0.000	0.000	0.000	0.000	0	3.294	0.000	0.000	0.000	0.000	0
26	4.936	0.000	0.000	0.003	0.003	1	3.600	0.000	0.000	0.000	0.000	0	1.045	0.000	0.000	0.000	0.000	0
27	4.712	0.000	0.000	0.000	0.000	0	3.636	0.000	0.000	0.000	0.000	0	0.577	0.000	0.000	0.000	0.000	0
28	4.430	0.000	0.000	0.000	0.000	0	3.607	0.000	0.000	0.000	0.000	0	0.555	0.000	0.000	0.000	0.000	0
29	3.861	0.000	0.000	0.000	0.000	0	4.330	0.000	0.000	0.000	0.000	0						
30	3.827	0.000	0.000	0.000	0.000	0	4.283	0.000	0.000	0.002	0.002	1						
31	3.879	0.000	0.000	0.000	0.000	0	4.251	0.000	0.000	0.000	0.000	0						
Ten Daily Mean																		
Ten Daily I	10.76	0.000	0.000	0.002	0.002	2	4.316	0.000	0.000	0.000	0.000	0	1.954	0.000	0.000	0.000	0.000	0
Ten Daily II	8.769	0.000	0.000	0.001	0.001	1	3.805	0.000	0.000	0.000	0.000	0	2.862	0.000	0.000	0.000	0.000	0
Ten Daily III	5.631	0.000	0.000	0.000	0.000	0	3.837	0.000	0.000	0.000	0.000	0	2.266	0.000	0.000	0.000	0.000	0
Monthly																		
Total						25						3						0

Annual Sediment Load (Metric Tonnes) : 257849

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

Day	Mar						Apr						May					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	0.569	0.000	0.000	0.000	0.000	0	1.124	0.000	0.000	0.000	0.000	0	0.644	0.000	0.000	0.000	0.000	0
2	0.561	0.000	0.000	0.000	0.000	0	0.990	0.000	0.000	0.000	0.000	0	0.665	0.000	0.000	0.000	0.000	0
3	0.543	0.000	0.000	0.000	0.000	0	0.969	0.000	0.000	0.019	0.019	2	0.788	0.000	0.000	0.000	0.000	0
4	0.545	0.000	0.000	0.000	0.000	0	0.935	0.000	0.000	0.000	0.000	0	0.672	0.000	0.000	0.000	0.000	0
5	0.536	0.000	0.000	0.000	0.000	0	0.892	0.000	0.000	0.000	0.000	0	0.664	0.000	0.000	0.000	0.000	0
6	0.514	0.000	0.000	0.029	0.029	1	0.880	0.000	0.000	0.000	0.000	0	0.618	0.000	0.000	0.000	0.000	0
7	0.511	0.000	0.000	0.000	0.000	0	0.886	0.000	0.000	0.000	0.000	0	0.480	0.000	0.000	0.000	0.000	0
8	0.516	0.000	0.000	0.000	0.000	0	2.129	0.000	0.000	0.000	0.000	0	0.342	0.000	0.000	0.000	0.000	0
9	0.509	0.000	0.000	0.000	0.000	0	2.127	0.000	0.000	0.000	0.000	0	0.347	0.000	0.000	0.000	0.000	0
10	0.477	0.000	0.000	0.000	0.000	0	2.099	0.000	0.000	0.067	0.067	12	0.561	0.000	0.000	0.000	0.000	0
11	0.469	0.000	0.000	0.000	0.000	0	2.160	0.000	0.000	0.000	0.000	0	0.561	0.000	0.000	0.000	0.000	0
12	0.536	0.000	0.000	0.000	0.000	0	2.199	0.000	0.000	0.000	0.000	0	0.559	0.000	0.000	0.000	0.000	0
13	1.800	0.000	0.000	0.000	0.000	0	0.845	0.000	0.000	0.000	0.000	0	0.540	0.000	0.000	0.000	0.000	0
14	4.958	0.000	0.000	0.023	0.023	10	0.830	0.000	0.000	0.000	0.000	0	0.450	0.000	0.000	0.000	0.000	0
15	4.788	0.000	0.000	0.000	0.000	0	0.795	0.000	0.000	0.000	0.000	0	0.458	0.000	0.000	0.000	0.000	0
16	4.882	0.000	0.000	0.000	0.000	0	0.815	0.000	0.000	0.000	0.000	0	0.471	0.000	0.000	0.000	0.000	0
17	4.856	0.000	0.000	0.000	0.000	0	0.809	0.000	0.000	0.073	0.073	5	0.452	0.000	0.000	0.000	0.000	0
18	4.820	0.000	0.000	0.000	0.000	0	0.806	0.000	0.000	0.000	0.000	0	0.464	0.000	0.000	0.000	0.000	0
19	4.500	0.000	0.000	0.000	0.000	0	0.752	0.000	0.000	0.000	0.000	0	0.343	0.000	0.000	0.000	0.000	0
20	5.135	0.000	0.000	0.026	0.026	12	0.753	0.000	0.000	0.000	0.000	0	0.313	0.000	0.000	0.000	0.000	0
21	1.737	0.000	0.000	0.000	0.000	0	0.752	0.000	0.000	0.000	0.000	0	0.550	0.000	0.000	0.000	0.000	0
22	1.738	0.000	0.000	0.000	0.000	0	0.631	0.000	0.000	0.000	0.000	0	0.883	0.000	0.000	0.077	0.077	6
23	1.708	0.000	0.000	0.000	0.000	0	0.715	0.000	0.000	0.000	0.000	0	0.851	0.000	0.000	0.000	0.000	0
24	1.699	0.000	0.000	0.000	0.000	0	0.788	0.000	0.000	0.000	0.000	0	0.856	0.000	0.000	0.000	0.000	0
25	1.703	0.000	0.000	0.000	0.000	0	0.795	0.000	0.000	0.000	0.000	0	0.884	0.000	0.000	0.000	0.000	0
26	1.700	0.000	0.000	0.000	0.000	0	0.785	0.000	0.000	0.000	0.000	0	0.862	0.000	0.000	0.000	0.000	0
27	2.635	0.000	0.000	0.043	0.043	10	0.782	0.000	0.000	0.000	0.000	0	1.037	0.000	0.000	0.000	0.000	0
28	2.850	0.000	0.000	0.000	0.000	0	0.683	0.000	0.000	0.000	0.000	0	1.005	0.000	0.000	0.000	0.000	0
29	2.806	0.000	0.000	0.000	0.000	0	0.674	0.000	0.000	0.000	0.000	0	0.973	0.000	0.000	0.000	0.000	0
30	2.713	0.000	0.000	0.000	0.000	0	0.675	0.000	0.000	0.000	0.000	0	1.297	0.000	0.000	0.000	0.000	0
31	2.680	0.000	0.000	0.000	0.000	0							1.268	0.000	0.000	0.000	0.000	0
Ten Daily Mean																		
Ten Daily I	0.528	0.000	0.000	0.003	0.003	0	1.303	0.000	0.000	0.009	0.009	1	0.578	0.000	0.000	0.000	0.000	0
Ten Daily II	3.674	0.000	0.000	0.005	0.005	2	1.076	0.000	0.000	0.007	0.007	1	0.461	0.000	0.000	0.000	0.000	0
Ten Daily III	2.179	0.000	0.000	0.004	0.004	1	0.728	0.000	0.000	0.000	0.000	0	0.951	0.000	0.000	0.007	0.007	1
Monthly																		
Total						32						19						6

Annual Sediment Load (Metric Tonnes) : 257849

Annual Sediment Load for period : 2001-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

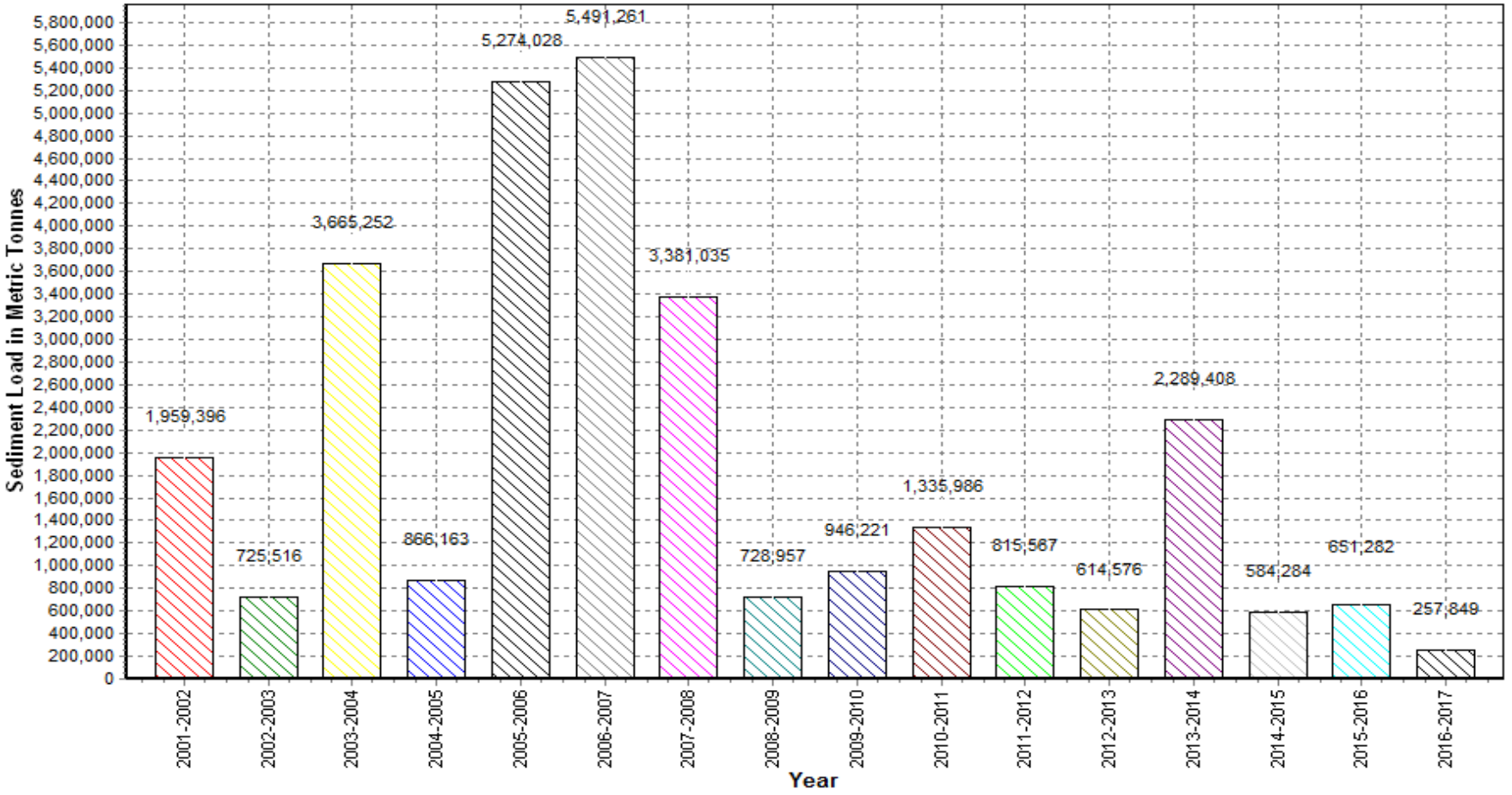
Local River : Rushikulya **Sub-Division : Behrampur**

Year	Monsoon (M.T.)	Non-Monsoon (M.T.)	Annual Load (M.T.)	Annual Run Off (MCM)
2001-2002	1958975	421	1959396	2416
2002-2003	725480	36	725516	878
2003-2004	3637975	27277	3665252	3338
2004-2005	866121	41	866163	1098
2005-2006	5267692	6336	5274028	2748
2006-2007	5489784	1477	5491261	2912
2007-2008	3379928	1107	3381035	2624
2008-2009	728823	134	728957	2067
2009-2010	945977	244	946221	2199
2010-2011	1280999	54988	1335986	2811
2011-2012	815111	456	815567	1022
2012-2013	614544	33	614576	1500
2013-2014	2288254	1154	2289408	5100
2014-2015	584148	136	584284	2731
2015-2016	650977	305	651282	1692
2016-2017	257763	85	257849	1523

Annual Sediment Load for the period: 2001-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

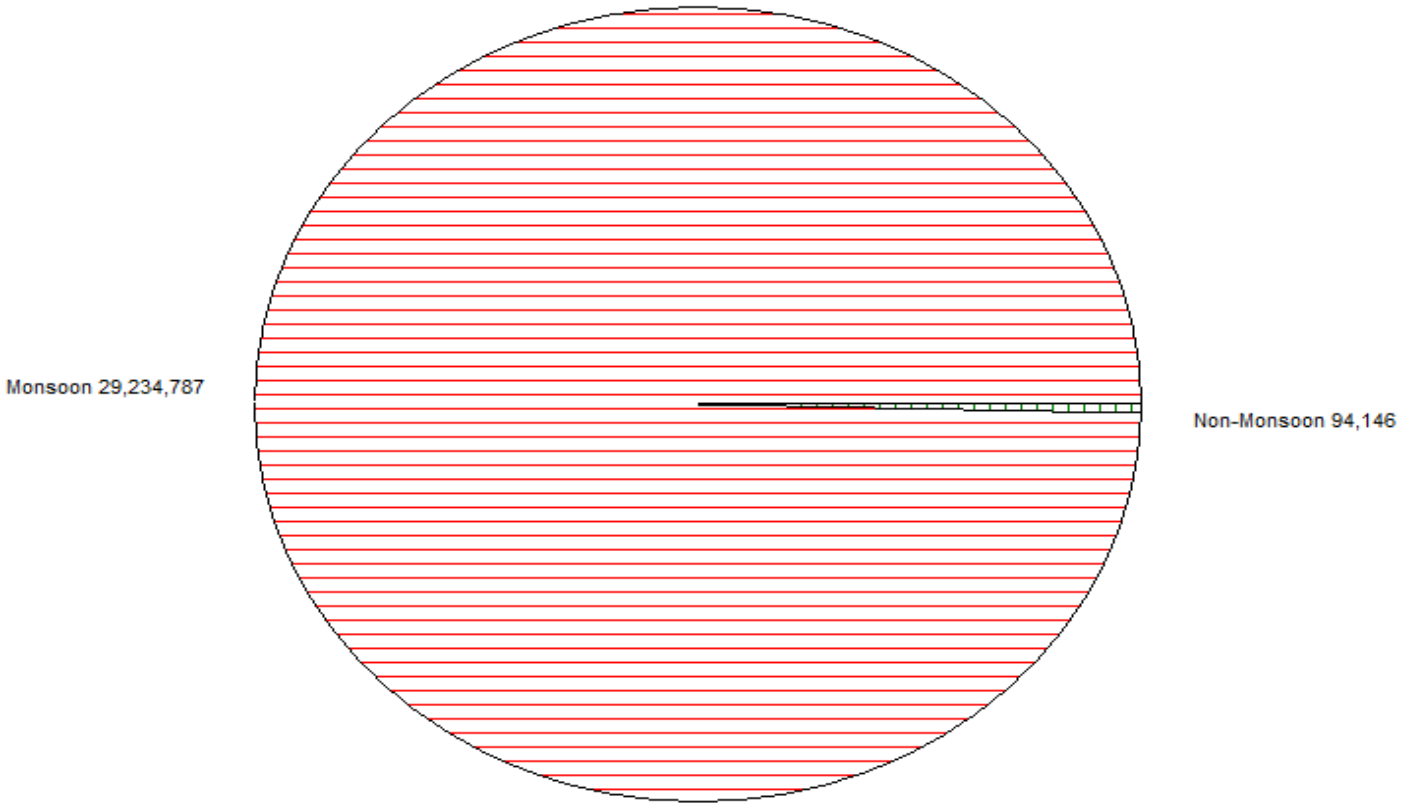
Local River : Rushikulya **Sub-Division : Behrampur**



Seasonal Sediment Load for the period : 2001-2016

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**



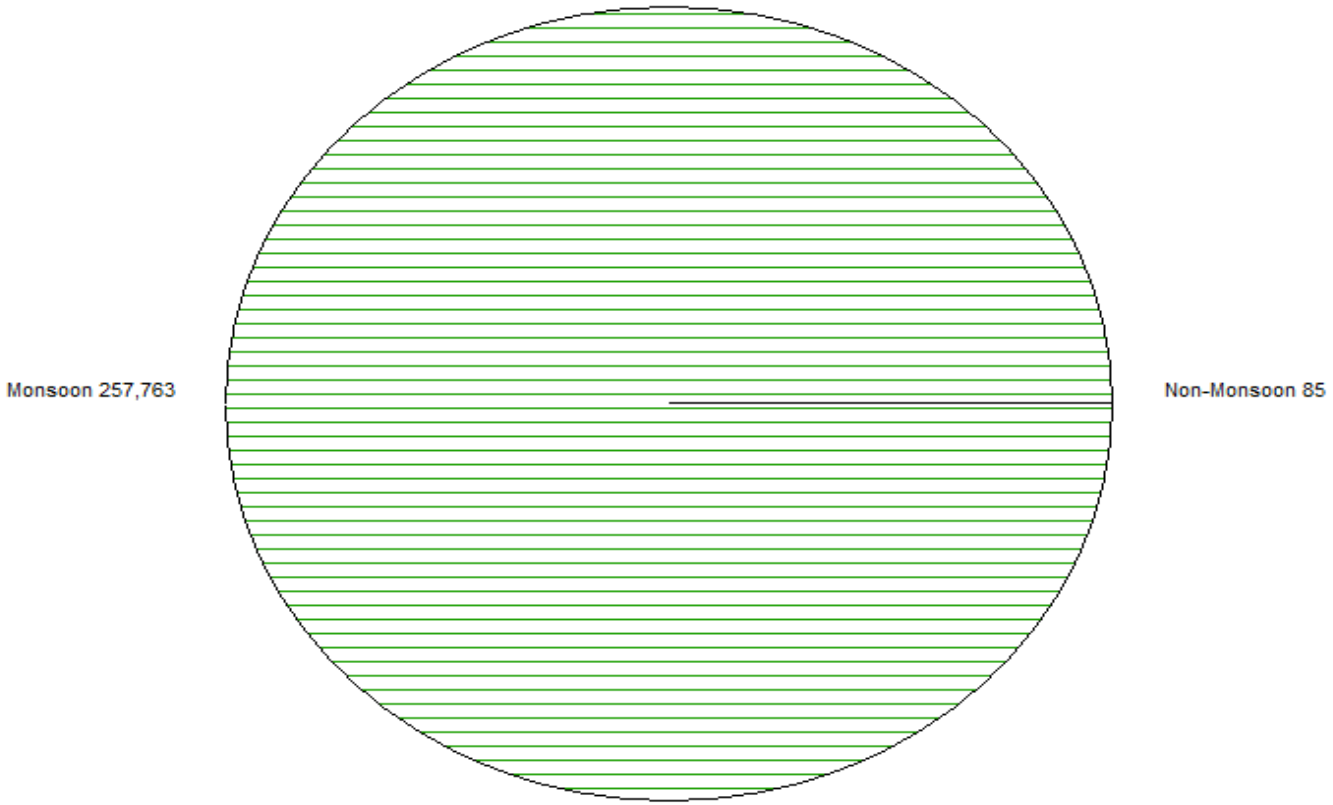
Seasonal Sediment Load for the Year: 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5)

Division : E.E., Bhubaneswar

Local River : Rushikulya

Sub-Division : Behrampur



Water Quality Datasheet for the period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **River Water Analysis** **Sub-Division : Behrampur**

S.No	Parameters	6/1/2016	8/1/2016	10/1/2016	12/1/2016	2/1/2017	4/1/2017
		A	A	A	A	A	A
	PHYSICAL						
1	Q (cumec)						
2	Colour_Cod (-)	Clear	Light Brown	Light Brown	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	358	301	280	831	413	442
4	EC_GEN (µmho/cm)	361	305	287	833	415	446
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	7.9	8.1	7.5	8.2	8.0	7.7
7	pH_GEN (pH units)	7.9	8.2	7.6	8.3	8.1	7.8
8	Temp (deg C)	32.0	31.5	28.0	30.0	19.5	28.5
	CHEMICAL						
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	134	129	111	60	74	69
3	B (mg/L)	0.01	0.02	0.01	0.01	0.01	0.03
4	Ca (mg/L)	43	42	43	38	101	96
5	Cl (mg/L)	171.6	181.1	17.0	15.1	13.2	24.5
6	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)	0.5	0.4	0.7	0.7	0.6	0.3
9	HCO3 (mg/L)	163	158	135	73	90	85
10	K (mg/L)	2.9	12.6	9.8	9.1	18.9	19.0
11	Mg (mg/L)	21.4	20.4	19.4	21.4	40.8	38.9
12	Na (mg/L)	82.9	54.7	28.5	32.1	62.1	51.4
13	NO2+NO3 (mg N/L)	1.05	1.35	1.22	1.06	0.98	1.13
14	NO2-N (mgN/L)	0.00	0.00	0.00	0.01	0.01	0.04
15	NO3-N (mgN/L)	1.05	1.35	1.22	1.05	0.97	1.09
16	P-Tot (mgP/L)	0.010	0.010	0.010	0.010	0.010	0.010
17	SiO2 (mg/L)	8.0	6.0	7.0	7.0	7.0	7.0
18	SO4 (mg/L)	5.5	5.6	1.2	4.0	4.4	4.8
	BIOLOGICAL/BACTERIOLOGICAL						
	TRACE & TOXIC						
	CHEMICAL INDICES						
1	HAR_Ca (mgCaCO3/L)	108	104	108	96	253	240
2	HAR_Total (mgCaCO3/L)	197	189	189	185	423	402
3	Na% (%)	47	37	24	26	23	21
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	2.6	1.7	0.9	1.0	1.3	1.1
	PESTICIDES						

Water Quality Summary for the period : 2016-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **Sub-Division : Behrampur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)				
2	EC_FLD (µmho/cm)	6	831	280	438
3	EC_GEN (µmho/cm)	6	833	287	441
4	pH_FLD (pH units)	6	8.2	7.5	7.9
5	pH_GEN (pH units)	6	8.3	7.6	8
6	Temp (deg C)	6	32.0	19.5	28.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	134	60	96
3	B (mg/L)	6	0.03	0.01	0.01
4	Ca (mg/L)	6	101	38	61
5	Cl (mg/L)	6	181.1	13.2	70.4
6	CO3 (mg/L)	6	0.0	0.0	0
7	F (mg/L)	6	0.05	0.05	0.05
8	Fe (mg/L)	6	0.7	0.3	0.5
9	HCO3 (mg/L)	6	163	73	117
10	K (mg/L)	6	19.0	2.9	12.1
11	Mg (mg/L)	6	40.8	19.4	27.1
12	Na (mg/L)	6	82.9	28.5	52
13	NO2+NO3 (mg N/L)	6	1.35	0.98	1.13
14	NO2-N (mgN/L)	6	0.04	0.00	0.01
15	NO3-N (mgN/L)	6	1.35	0.97	1.12
16	P-Tot (mgP/L)	6	0.010	0.010	0.01
17	SiO2 (mg/L)	6	8.0	6.0	7
18	SO4 (mg/L)	6	5.6	1.2	4.3
	BIOLOGICAL/BACTERIOLOGICAL				
	TRACE & TOXIC				
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	253	96	152
2	HAR_Total (mgCaCO3/L)	6	423	185	264
3	Na% (%)	6	47	21	30
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.6	0.9	1.4
	PESTICIDES				

Water Quality Seasonal Average for the period: 2002-2017

Station Name : PURUSHOTTAMPUR (ER000U5) | **Division : E.E., Bhubaneswar**

Local River : Rushikulya | **River Water** | **Sub-Division : Behrampur**

S.No	Parameters	Flood																	
		Jun - Oct																	
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002-2003	2003-2004	2004-2005
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)	255	280	290			270		300	325	293	206	230	180	612	313	285	243	345
3	EC_GEN (µmho/cm)	254	276	290			263		300	325	293	206	230	180	614	318	281	245	345
4	pH_FLD (pH units)	7.7	7.3	7.7			7.9		7.8	7.8	8.1	7.8	7.5	7.5	7.3	7.8	7.7	7.5	7.9
5	pH_GEN (pH units)	7.7	7.3	7.7			7.9		7.8	7.8	8.1	7.8	7.5	7.5	7.5	7.9	7.6	7.5	8.0
6	Temp (deg C)	31.3	31.0	29.6			32.5		30.7	28.8	27.0	30.1	30.3	26.1	23.0	30.5	26.8	26.1	29.0
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)						0.0		0.0	0.0	0.0		0.0	0.0	3.1	0.0			
2	ALK-TOT (mgCaCO3/L)						92		99	76	115		51	98	89	125			
3	B (mg/L)	0.00	0.00	0.00			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
4	Ca (mg/L)	25	30	30			27		25	36	30	20	19	33	23	43	34	27	34
5	Cl (mg/L)	18.3	18.2	18.3			18.1		20.7	17.7	17.6	16.0	20.8	17.0	17.0	123.2	15.1	16.5	26.3
6	CO3 (mg/L)	0.1	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0
7	F (mg/L)	0.55	0.07	0.47			0.05		0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.40	0.02	0.50
8	Fe (mg/L)	0.1	0.1	0.1			0.1		0.2	0.1	0.0	1.3	0.1	0.4	0.3	0.5	0.0	0.1	0.1
9	HCO3 (mg/L)	113	124	136			108		120	93	141	130	61	119	101	152	134	112	159
10	K (mg/L)	1.7	2.1	3.6			2.8		2.8	3.8	2.6	2.6	1.1	3.3	2.2	8.4	1.6	2.3	2.8
11	Mg (mg/L)	8.7	7.3	9.7			9.6		12.6	8.8	11.7	7.4	3.5	13.6	12.6	20.4	7.8	6.2	11.7
12	Na (mg/L)	12.6	12.6	11.8			11.7		14.2	12.0	14.1	11.0	11.1	18.7	9.6	55.4	10.1	11.0	16.5
13	NO2+NO3 (mg N/L)	0.43	0.44	0.63			0.85		0.53	0.76	0.41	0.78	1.04	0.91	0.93	1.21	0.23	0.74	0.54
14	NO2-N (mgN/L)	0.00	0.00	0.00			0.00		0.00	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
15	NO3-N (mgN/L)	0.43	0.44	0.63			0.85		0.53	0.76	0.35	0.78	1.04	0.91	0.92	1.21	0.23	0.74	0.54
16	o-PO4-P (mg P/L)						0.017		0.043									0.000	
17	P-Tot (mgP/L)	0.001	0.001	0.001			0.025		0.010	0.001	0.010	0.001	0.001	0.001	0.007	0.010	0.001	0.003	0.001
18	SiO2 (mg/L)	11.7	15.6	32.4			9.0		8.4	9.5	12.7	11.5	9.2	6.0	6.7	7.0	9.2	15.9	33.4
19	SO4 (mg/L)	4.5	5.1	2.2			10.8		14.9	48.3	3.9	4.0	18.3	6.4	12.6	4.1	6.0	4.2	2.4
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)	64	76	75			67		61	90	75	50	49	83	57	107	84	69	84
2	HAR_Total (mgCaCO3/L)	100	106	105			107		114	127	123	81	63	140	110	192	116	94	123
3	Na% (%)	21	20	18			19		21	17	20	23	28	22	13	36	16	20	21
4	RSC (-)	0.0	0.0	0.0			0.0		0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	0.5	0.5	0.5			0.5		0.6	0.5	0.6	0.5	0.6	0.7	0.4	1.7	0.4	0.5	0.6
	PESTICIDES																		

Water Quality Seasonal Average for the period: 2002-2017

Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

Local River : Rushikulya **River Water** **Sub-Division : Behrampur**

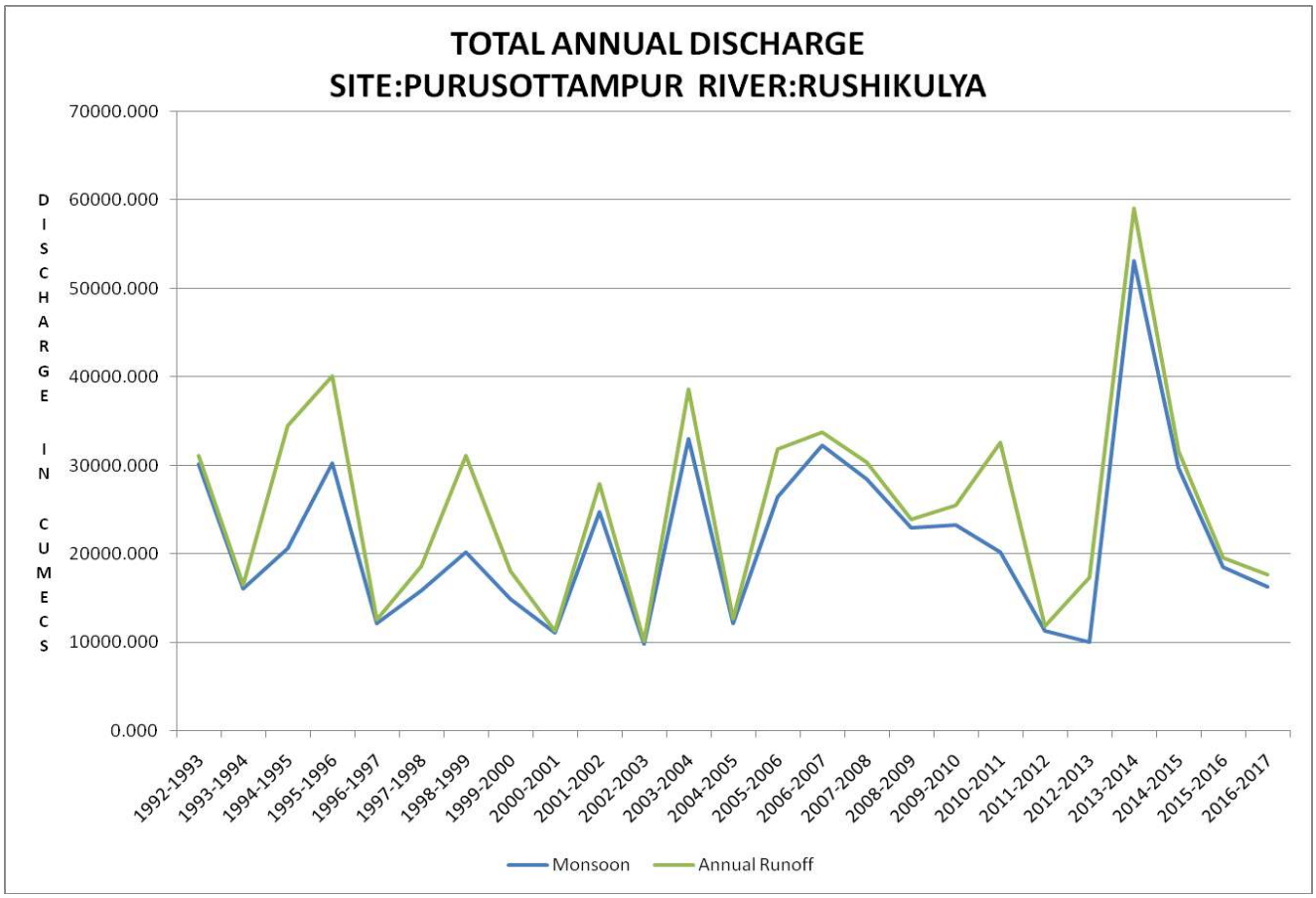
S.No	Parameters	Winter																	
		Nov - Feb																	
		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2003	2004	2005	2006	2007	2008
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)			271		330	385	300	220	260	225	384	622	324	287				300
3	EC_GEN (µmho/cm)			255		330	385	300	220	260	225	389	624	327	290				300
4	pH_FLD (pH units)			7.9		7.8	7.8	7.9	7.9	8.0	7.7	7.9	8.1	7.9	7.6				8.2
5	pH_GEN (pH units)			8.0		7.8	7.8	7.9	7.9	8.0	7.7	8.0	8.2	8.0	7.7				8.3
6	Temp (deg C)			21.0		20.5	24.8	22.5	24.6	21.2	22.8	27.0	24.8	29.7	30.0				29.0
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)			0.0		0.0	0.0	0.0			0.0	23.0	0.0						0.0
2	ALK-TOT (mgCaCO3/L)			83		93	121	92			125	113	67						115
3	B (mg/L)			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00				0.07
4	Ca (mg/L)			24		26	36	32	30	20	35	20	70	36	29				26
5	Cl (mg/L)			19.0		33.1	32.1	14.1	18.9	18.2	17.9	16.0	14.1	21.4	19.1				16.9
6	CO3 (mg/L)			0.0		0.0	0.0	0.0	0.0	0.0	0.0	27.7	0.0	0.0	0.0				0.0
7	F (mg/L)			0.28		0.11	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.53	0.00				0.05
8	Fe (mg/L)			0.1		0.1	0.1	0.0	1.1	0.0	0.3	0.5	0.7	0.1	0.0				
9	HCO3 (mg/L)			102		113	147	113	138	96	153	82	82	146	129				140
10	K (mg/L)			3.4		2.2	3.2	3.0	2.7	1.4	3.2	1.3	14.0	1.7	2.2				2.1
11	Mg (mg/L)			9.1		11.7	12.2	17.5	7.3	6.3	8.8	12.1	31.1	8.4	9.6				12.4
12	Na (mg/L)			12.8		22.6	21.2	18.3	20.2	10.2	18.0	3.0	47.1	16.9	13.6				13.1
13	NO2+NO3 (mg N/L)			0.89		0.74	0.81	0.41	0.71	0.53	0.95	1.04	1.02	0.42	0.56				0.43
14	NO2-N (mgN/L)			0.00		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.00	0.00				0.00
15	NO3-N (mgN/L)			0.89		0.74	0.81	0.34	0.71	0.53	0.95	1.04	1.01	0.42	0.56				0.43
16	o-PO4-P (mg P/L)			0.000		0.050													0.021
17	P-Tot (mgP/L)			0.001		0.010	0.001	0.010	0.001	0.001	0.001	0.010	0.010	0.004	0.001				0.050
18	SiO2 (mg/L)			9.7		9.8	8.8	11.5	11.5	10.8	6.0	5.5	7.0	12.6	15.9				9.9
19	SO4 (mg/L)			10.5		16.5	18.3	2.5	2.3	16.3	8.3	2.7	4.2	7.4	4.0				10.2
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)			60		64	90	80	75	51	87	50	174	91	73				66
2	HAR_Total (mgCaCO3/L)			98		113	141	153	106	77	124	101	304	126	112				117
3	Na% (%)			21		30	24	20	29	22	24	6	25	22	21				19
4	RSC (-)			0.0		0.0	0.0	0.0	0.2	0.1	0.1	0.5	0.0	0.0	0.0				0.0
5	SAR (-)			0.6		0.9	0.8	0.6	0.9	0.5	0.7	0.1	1.2	0.7	0.6				0.5
	PESTICIDES																		

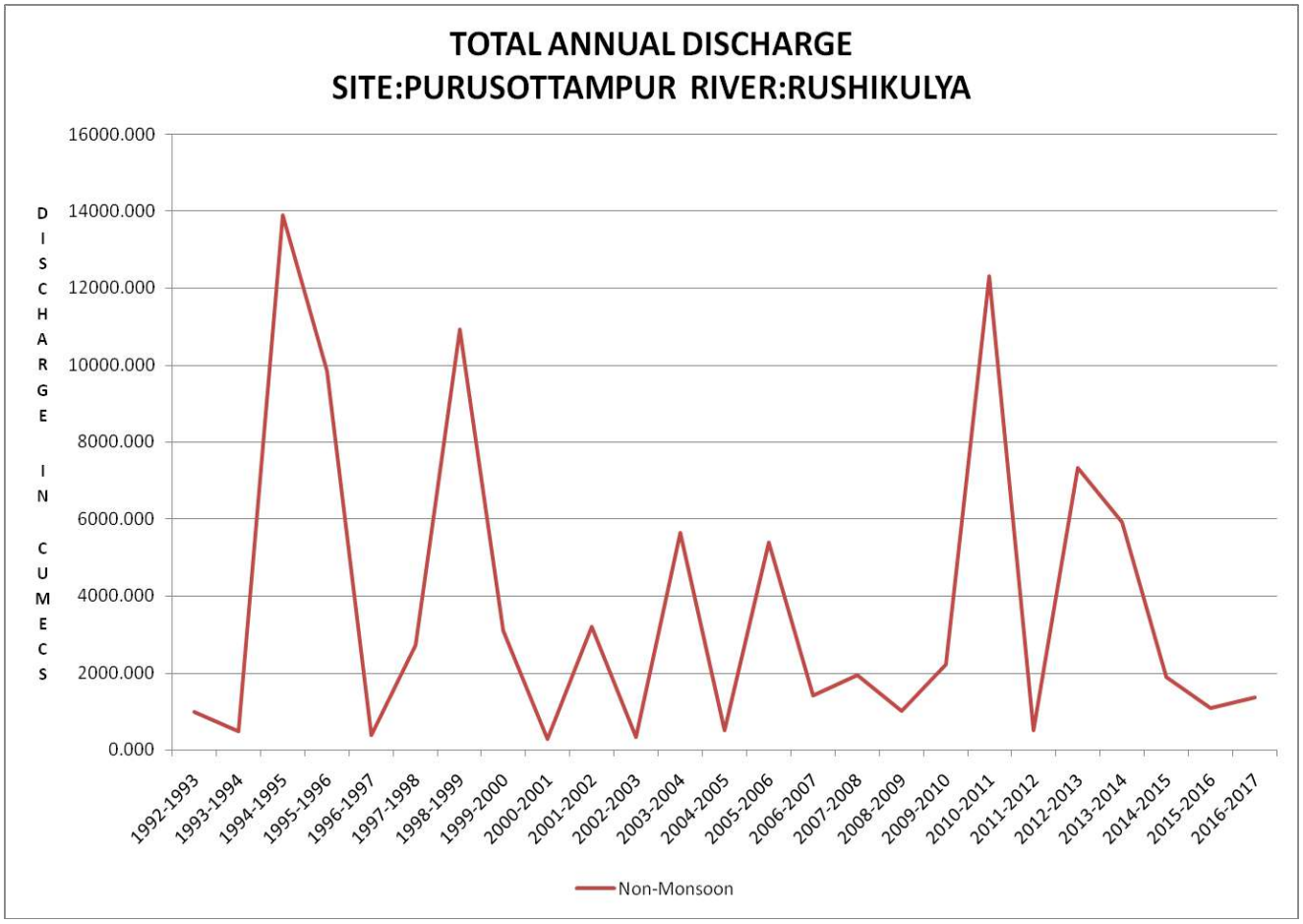
Water Quality Seasonal Average for the period: 2002-2017

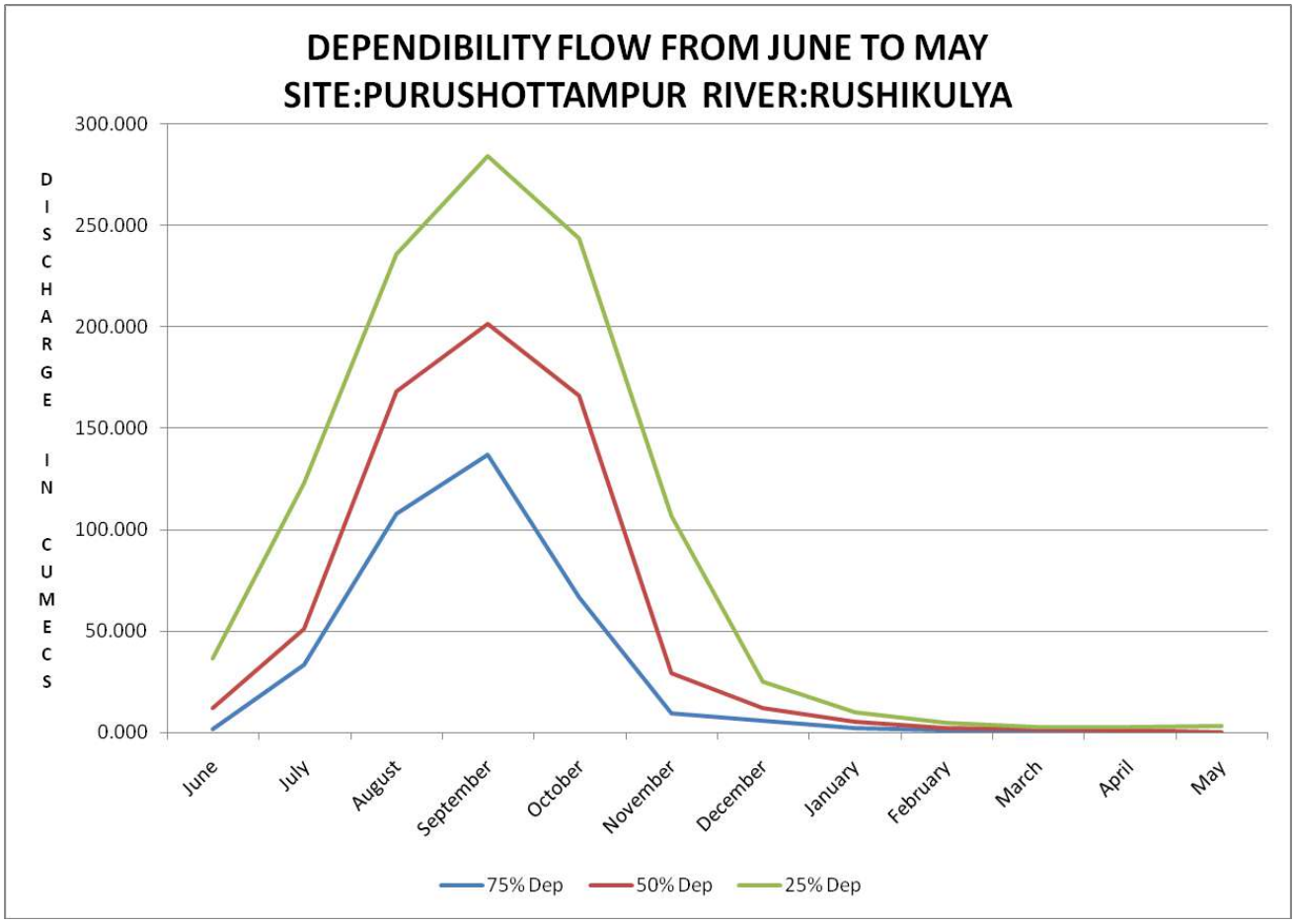
Station Name : PURUSHOTTAMPUR (ER000U5) **Division : E.E., Bhubaneswar**

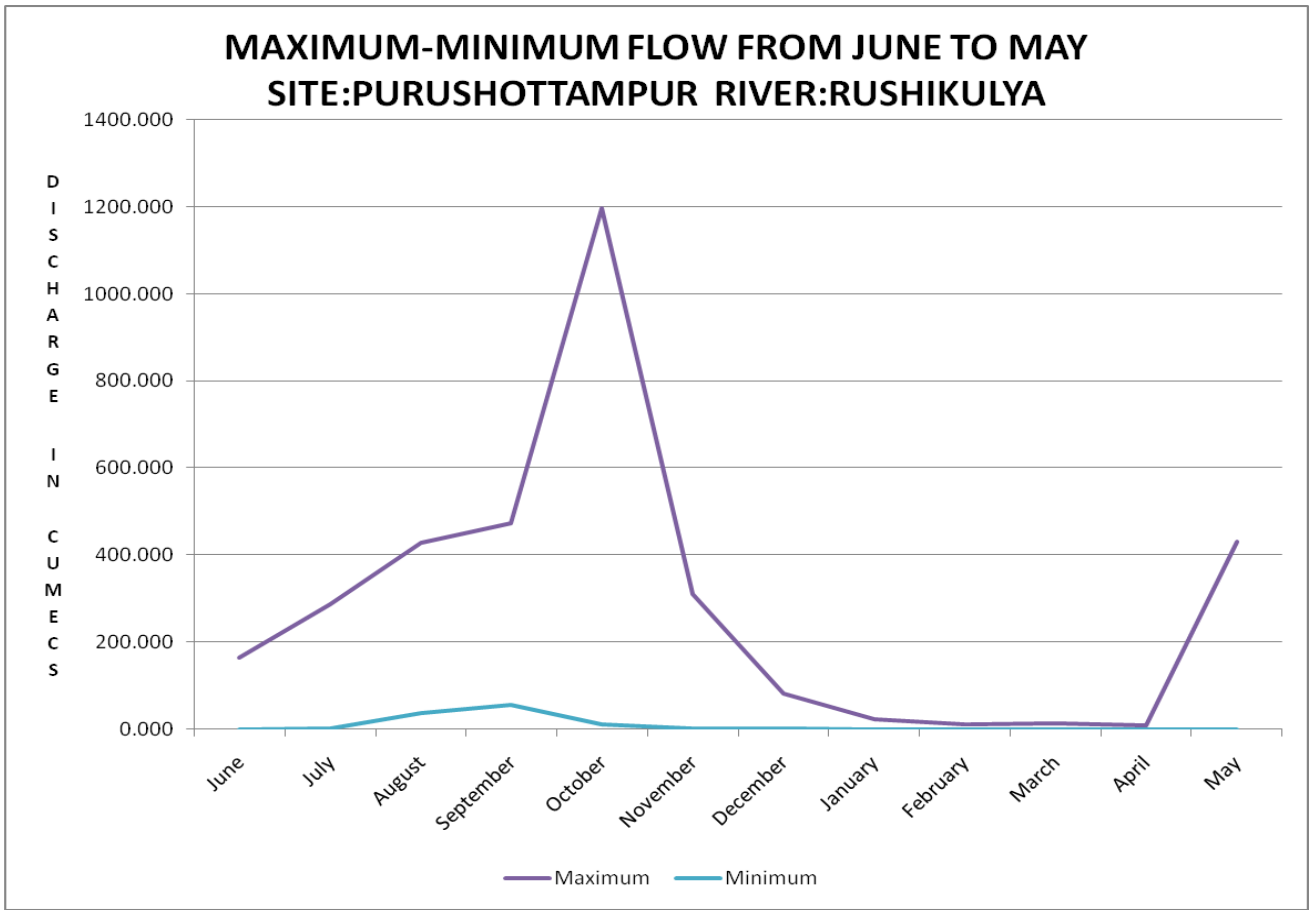
Local River : Rushikulya **River Water** **Sub-Division : Behrampur**

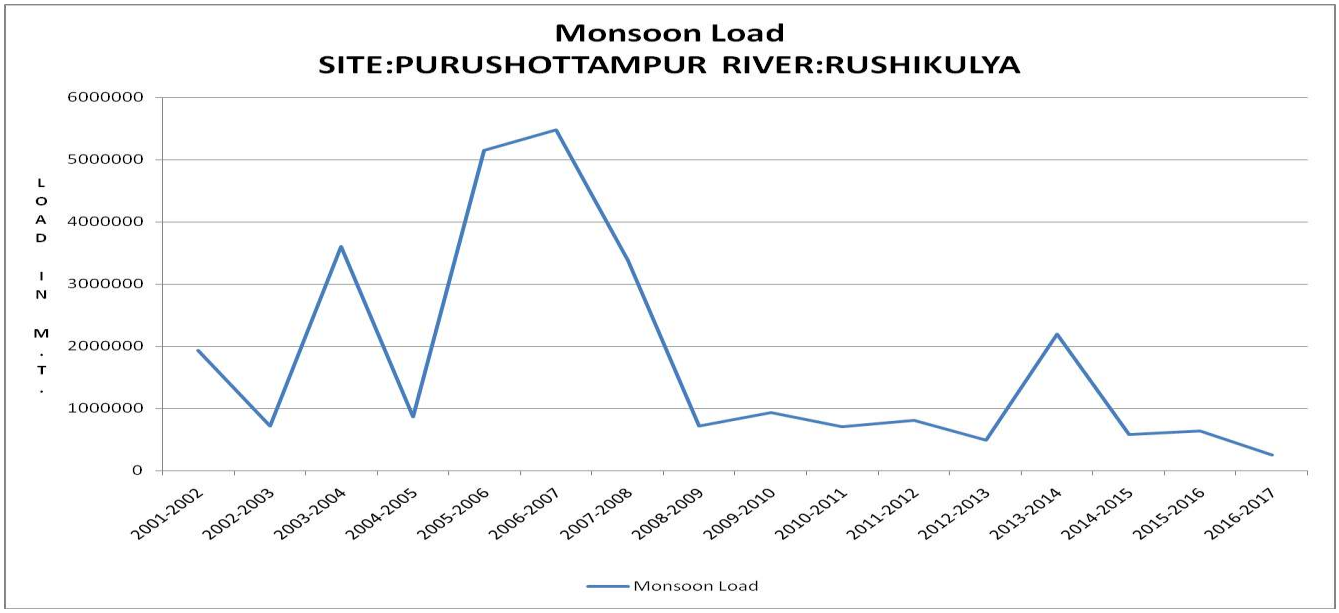
S.No	Parameters	Summer								
		Mar - May								
		2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL									
1	Q (cumec)									
2	EC_FLD (µmho/cm)		280	420	290	210	340	380	580	442
3	EC_GEN (µmho/cm)		280	420	290	210	340	380	588	446
4	pH_FLD (pH units)		7.9	8.1	7.6	7.7	8.0	7.3	7.9	7.7
5	pH_GEN (pH units)		7.9	8.1	7.6	7.7	8.0	7.3	8.0	7.8
6	Temp (deg C)		32.0	28.0			26.3	29.5	21.0	28.5
	CHEMICAL									
1	Alk-Phen (mgCaCO3/L)		0.0	0.0	0.0	0.0		0.0	46.0	0.0
2	ALK-TOT (mgCaCO3/L)		76	123	125	120		126	157	69
3	B (mg/L)		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.03
4	Ca (mg/L)		19	32	27	27	24	38	29	96
5	Cl (mg/L)		29.7	34.0	32.1	18.2	25.6	31.1	18.9	24.5
6	CO3 (mg/L)		0.0	0.0	0.0	0.0	0.0	0.0	55.4	0.0
7	F (mg/L)		0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)		0.0	0.1	0.0	1.1	0.0	0.4	0.5	0.3
9	HCO3 (mg/L)		93	151	152	147	113	153	79	85
10	K (mg/L)		4.7	3.4		2.6	2.1	2.1	3.5	19.0
11	Mg (mg/L)		9.7	16.5	3.9	7.8	6.2	3.9	13.6	38.9
12	Na (mg/L)		21.9	21.3		10.2	12.8	19.1	53.0	51.4
13	NO2+NO3 (mg N/L)		0.99	0.60	0.36	0.71	1.18	0.78	1.16	1.13
14	NO2-N (mgN/L)		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.04
15	NO3-N (mgN/L)		0.99	0.60	0.29	0.71	1.18	0.78	1.16	1.09
16	o-PO4-P (mg P/L)		0.020							
17	P-Tot (mgP/L)		0.010	0.001	0.010	0.001	0.001	0.001	0.010	0.010
18	SiO2 (mg/L)		8.3	9.5	8.0	12.0	11.6	6.0	5.0	7.0
19	SO4 (mg/L)		11.4	29.5	3.7	4.5	22.8	9.4	3.2	4.8
	BIOLOGICAL/BACTERIOLOGICAL									
	TRACE & TOXIC									
	CHEMICAL INDICES									
1	HAR_Ca (mgCaCO3/L)		48	80	68	68	61	95	72	240
2	HAR_Total (mgCaCO3/L)		89	149	84	101	86	111	129	402
3	Na% (%)		34	23		18	24	27	47	21
4	RSC (-)		0.0	0.0	0.8	0.4	0.1	0.3	0.6	0.0
5	SAR (-)		1.0	0.8		0.4	0.6	0.8	2.0	1.1
	PESTICIDES									

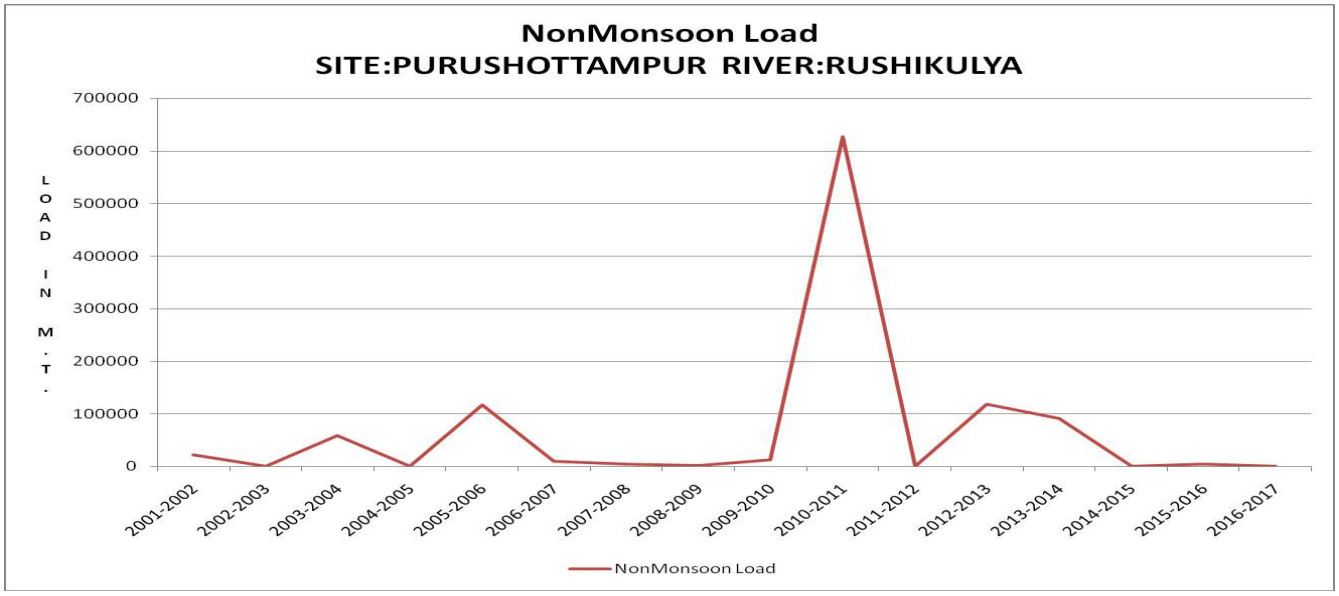

TOTAL ANNUAL DISCHARGE
SITE:PURUSOTTAMPUR RIVER:RUSHIKULYA
DISCHARGE IN CUMECS
70000.000
60000.000
50000.000
40000.000
30000.000
20000.000
10000.000
0.000
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon
Annual Runoff

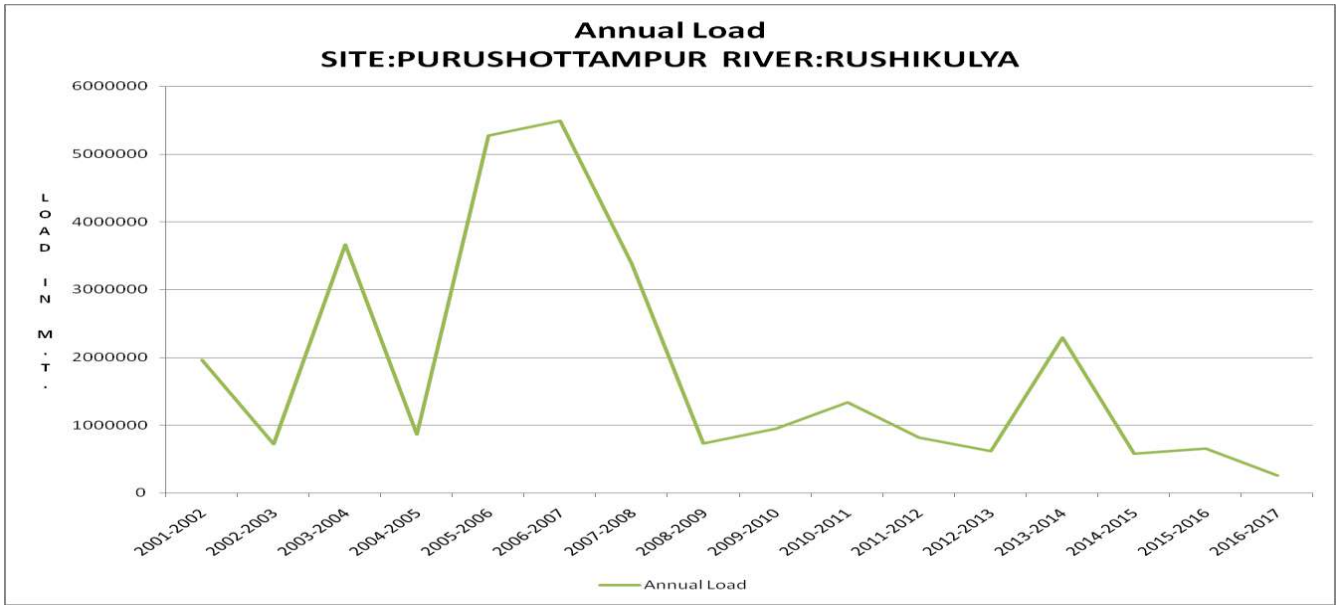

TOTAL ANNUAL DISCHARGE
SITE:PURUSOTTAMPUR RIVER:RUSHIKULYA
DISCHARGE IN CUMECS
16000.000
14000.000
12000.000
10000.000
8000.000
6000.000
4000.000
2000.000
0.000
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Non-Monsoon

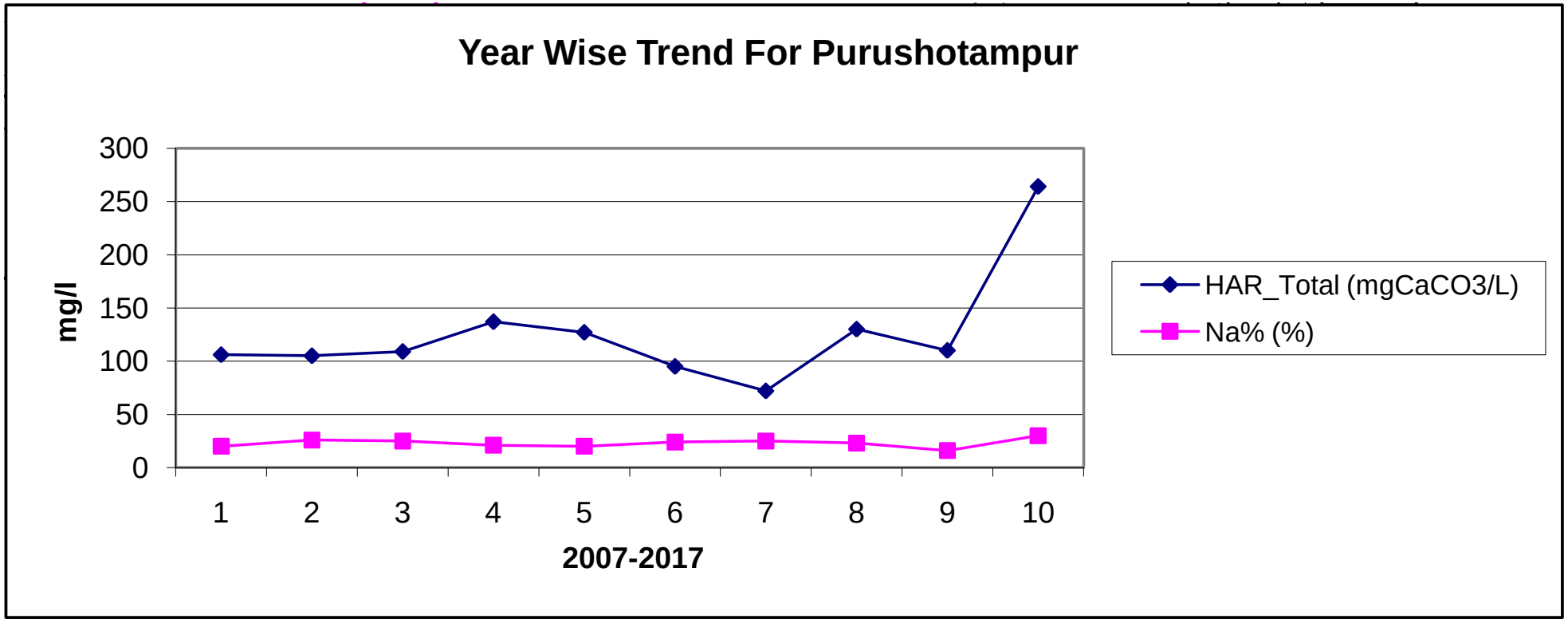

DEPENDIBILITY FLOW FROM JUNE TO MAY
SITE:PURUSHOTTAMPUR RIVER:RUSHIKULYA
DISCHARGE IN CUMECS
300.000
250.000
200.000
150.000
100.000
50.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
75% Dep
50% Dep
25% Dep

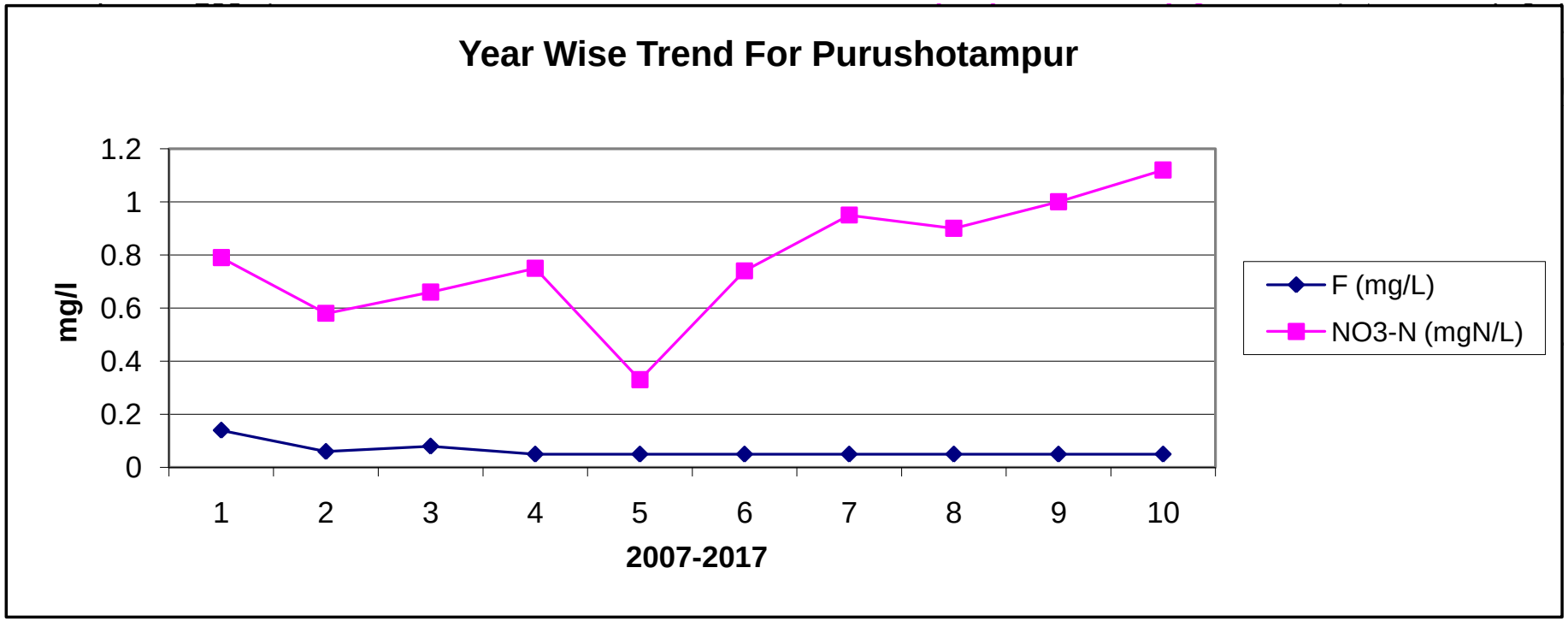

MAXIMUM-MINIMUM FLOW FROM JUNE TO MAY
SITE:PURUSHOTTAMPUR RIVER:RUSHIKULYA
DISCHARGE IN CUMECS
1400.000
1200.000
1000.000
800.000
600.000
400.000
200.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
Maximum
Minimum

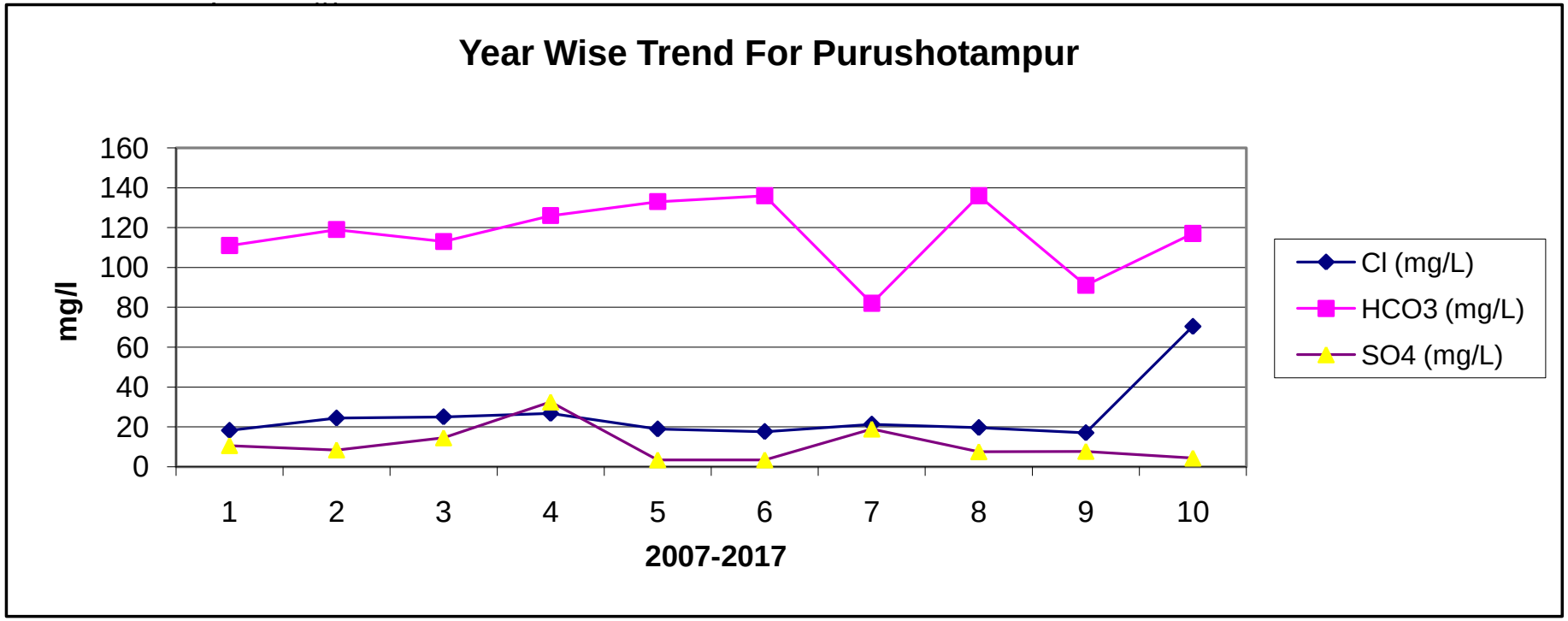

Monsoon Load
SITE:PURUSHOTTAMPUR RIVER:RUSHIKULYA
LOAD IN M.T.
6000000
5000000
4000000
3000000
2000000
1000000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon Load

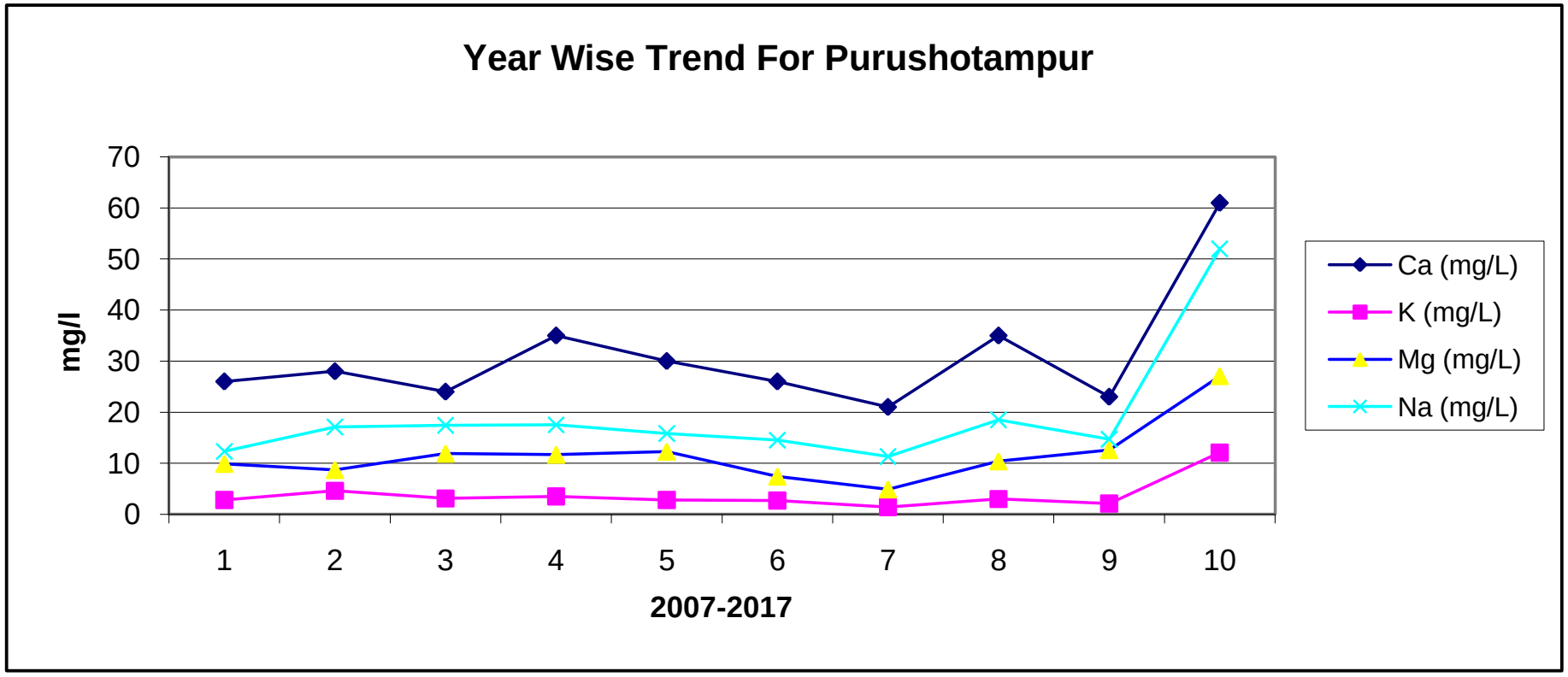

NonMonsoon Load
SITE:PURUSHOTTAMPUR RIVER:RUSHIKULYA
LOAD IN M.T.
700000
600000
500000
400000
300000
200000
100000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
NonMonsoon Load


Annual Load
SITE:PURUSHOTTAMPUR RIVER:RUSHIKULYA
LOAD IN M.T.
6000000
5000000
4000000
3000000
2000000
1000000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Annual Load


Year Wise Trend For Purushotampur
300
250
200
150
100
50
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
HAR_Total (mgCaCO3/L)
Na% (%)


Year Wise Trend For Purushotampur
1.2
1
0.8
0.6
0.4
0.2
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
F (mg/L)
NO3-N (mgN/L)


Year Wise Trend For Purushotampur
160
140
120
100
80
60
40
20
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
Cl (mg/L)
HCO3 (mg/L)
SO4 (mg/L)


Year Wise Trend For Purushotampur
70
60
50
40
30
20
10
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
Ca (mg/L)
K (mg/L)
Mg (mg/L)
Na (mg/L)

NAGAVALI BASIN

NAGAVALI BASIN

1 GENERAL

1.1 Introduction

River Nagavali is a medium sized east flowing river in peninsular India and lies within the geographical co-ordinates of North latitude 18°10 ′to 19°44′ and East longitudes of 82 °53′ and 84 °05′. It originates near the Lakhbahal village in Kalahandi district (Odisha) at an elevation of about 1300 m. The total length of the river run is 256 km. It is surrounded by Vamsadhara in the North, Champavathi and Peddagedda in the South, Godavari in the West and the Bay of Bengal in the East. It drains parts of the districts of Kalahandi, Rayagada, Koraput of Odisha State and Srikakulam, Vijayanagaram and Visakhapatanam of Andhra Pradesh State. The total basin area is 9510 sq. km and the state wise break-up is tabulated below.

State-wise Catchment area distribution

Sl. No.	**Name of State**	**Catchment Area (sq. km)**	**Percentage of total catchment area**
1.	Odisha	4462	46.9
2.	Andhra Pradesh	5048	53.1
	Total	**9510**	**100.0**

Basin Map of Nagavali river system showing the various hydrological and hydro-meteorological observation stations maintained by CWC, State Government and India Meteorological Department is enclosed herewith.

1.2 River System.

The important tributaries are Janjhavati, Vottigedda, Suvarnamukhi, and Vegavathi. Details of the tributaries which join Nagavali River on both sides are tabulated below:

Name of River	River/Tributary	Length (km)	Catchment area (sq.km)	Percentage of total catchment area
Nagavali	Main Stream	256	5704	59.9
Janjhavati	Right Tributary	70	931	9.8
Vottigedda	Left Tributary	50	606	6.4
Suvarnamukhi	Right Tributary	95	1275	13.4
Vegavathi	Right Tributary	90	994	10.5
		Total	9510	100.0

1.3 Climatic Characteristics

The Basin is mostly influenced by South West monsoon, in addition to cyclonic rainfall due to the formation of depressions in the Bay of Bengal. The average annual rainfall in the basin is around 1000mm. The maximum temperature in the plains of the basin rises upto 40°C during May and goes down to 16ºC in December-January. The average relative humidity during monsoon varies between 80% to 84%.

1.4 Geology

The geological structure of the basin is formed with Pleistocene deposits along the coastal belt and along the course of the river and its major tributaries. Khondalites, unclassified Crystalline and Granites are found in limited areas. Manganese, Quartz, Mica, Graphite, Limestone, Bauxite and construction materials are found in abundance in the Basin.

1.5 Site Details

Details of water storage/ diversion structures in the Nagavali Basin are as below:

Sl. No.	Name of Project	River	Status
1.	Thotapally regulator	Nagavali	Existing
2.	Narayan Puram Anicut	Nagavali	Existing
3.	Vegavathi Anicut	Peddagedda	Existing
4.	Vottigedda Reservoir	Vottigedda	Existing
5.	Peddankumal Anicut	Suvarnamukhi	Existing
6.	Janjavathi Reservoir	Janjavathi	Existing
7.	Madhuvalsa Project	Suvarnamukhi	Existing
8.	Suvarnamukhi-Gomukhi Reservoir	Suvarnamukhi	Existing

2. STREAM FLOW DATA

2.1 Methodology

Area-velocity method is generally adopted for measuring discharge at sites. Cup type current meter is used to measure the velocity of the flow and the depth is measured by using sounding rod for depths upto 3 m and by log line beyond 3 m. Discharge by area velocity method is being observed once in a day starting at 0800 Hrs. at all the sites except on Sundays and holidays. Besides, silt and water quality observation are also being carried out at CWC sites as list above.
The observed stage and discharge figures for each season (monsoon and non-monsoon) are plotted and a mean Stage V/s. Discharge curve is drawn, giving due attention to the scattered points with reference to area, velocity etc.

The factors responsible for the shifting of the curves are also taken care of by studying the river cross section at regular intervals and with super imposition of previous years' Stage V/s. Discharge curves. Accordingly, the trend of the current curve is finalised. Finally, the discharges of the non observed days are computed from these Stage V/s. Discharge Curves.

2.2 Data Availability

Details of data availability for Nagavali Basin is tabulated below:

Code No.	Station Name	Type	Data available	
			From	To
AN000Y2	Srikakulam	GDSQ	G -16.02.88	Continuing
			D -25.08.90	-do-
			S -27.06.01	-do-
			Q -27.06.01	-do-

2.3 Explanatory Notes on Water Year Book

SWDES (Surface Water Data Entry Software), a custom made software for processing hydrological data has been used for preparation of this volume. The explanatory notes described below can be used for interpretation of data presented in this volume.

i) Water Year ranges from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

ii) Discharge is given in cubic meters per second.

iii) Discharges are expressed as 0.000 when river bed is dry and 0.000 N.F. when velocity is observed as 'NIL'.

iv) The zero R.L. of gauge is a datum level fixed for given site, which is kept 1 or 2 m lower than the lowest water level recorded in a perennial stream. In a non-perennial stream, it is kept 1 or 2 m lower than the lowest bed level of the stream.

v) Discharges are rounded off as per standard practice.

vi) Runoff in mm is the notional depth of water in millimeters over the catchment, equivalent to annual runoff volume calculated at the discharge measurement station. It is computed using the relation:

$$\text{Runoff (mm)} = \frac{\text{Annual runoff (Mm3) x 1000}}{\text{Catchment area (km2)}}$$

vii) Peak and lowest flow correspond to the highest and lowest water levels recorded from 'SWDES' entered data.

viii) Measuring Authority refers to the field division of Central Water Commission (Eastern Rivers Division) responsible for the operation of the gauging station.

ix) The gauging station code number is a unique seven column alphanumeric reference number which facilitates storage and retrieval of flow data in data base. The first column is identifier of either an integral river basin or, for the sake of convenience, a region having several contiguous river catchments. This is followed by a column which identifies an independent river system which either has one or more outlets to the sea or crosses international border to enter another country. The third, fourth and fifth column spaces denote first, second and third order tributaries, respectively, from the mouth upstream. The sixth and seventh column spaces indicate the location of the gauging station in one of the 225 slots earmarked on the river. The blank column spaces are filled by zero.

3. HYDROLOGICAL DATA

This volume contains the following information for each site stated above:

i. History Sheet: Site Name, State, District, River Basin, Tributary, Sub-Tributary, Catchment Area, Latitude / Longitude, Opening / Closing date for various types of data.

ii. Annual maximum/minimum discharge since period of observation.

iii. Daily Water level and observed/ computed discharge data including 10-daily, monthly and annual totals etc.

iv. Histogram and Hydrograph showing current year monthly mean discharges, Historical monthly mean discharges, historical monthly minimum and monthly maximum discharges.

v. Histogram showing Annual Run off volume since beginning of observation.

vi. Pie-Chart showing monthly mean run off (as percentage of Annual Run off) historical for the current year.

vii. Plot of Pre and Post Monsoon Cross-section of the rivers for current year.

viii. Water Level hydrograph for 3(three) major flood events of current year.

4. SEDIMENT DATA (In case of Sediment Observation sites)

The frequency of sediment observation is carried out daily during monsoon season and once in a week (on Monday) during the non-monsoon period. Data for non-observed days is estimated/ interpolated from the relationship of discharge v/s. sediment load, prepared on the basis of observed sediment concentration and weighted mean discharge of the same year.

Sediment samples are collected from 0.6 depth, using Punjab type bottle sampler, from all the verticals along the hydrological observation sections where velocity is observed for computation of discharge. The collected samples from all the segments are combined in 3 to 7 groups having compartments or groups of equal or nearly equal discharges for analysis. Quantum of suspended sediment load is estimated in three grades, viz. Coarse, Medium and Fine. Coarse and medium grades are separated by sieving process and the fine grade by filtration of left over samples after sieving through filter paper. Grade wise concentration is derived gravimetrically as per standard procedure. The following parameters are derived and recorded:

- Daily Observed suspended sediment (g/l).
- Corresponding discharge.
- Average sediment load in tonnes/day (10 daily & monthly basis).
- Annual sediment load for the current year.
- Annual & Seasonal sediment load and the corresponding volume of inflow for all the years since inception.
- Grain size distribution of bed load.

5. WATER QUALITY DATA (In case of Water Quality Observation sites)

The water samples are collected at a regular interval of once in a month for trend stations and once in two month for base stations (on 1st working day), from the main flowing segment of the stream just below the water surface (20 to 30 cm) on the Station Gauge line where depth of flow and velocity are maximum, preferably in the mid stream. The water samples are collected in the pre-rinsed and cleaned one-litre capacity polythene bottle having double stopper (inside and outside) facility. Sampling bottle is filled to its full capacity without entrapping air bubbles inside.

After sampling, the collected samples are sent to the Water Quality Laboratory (Level-II) based at Bhubaneswar (under the Eastern Rivers Division) and to Raipur laboratory (under Mahanadi Division, Burla), along with in-situ physical characteristics, for analysis. The samples received from the sites are preserved in a refrigerator in the water quality laboratories for analysis.

Analysis of parameters, namely pH, Electrical conductivity, Sodium, Potassium, Iron, Aluminum, Ammonia, Fluoride, Nitrate, Nitrite, Phosphate, Silicate, Boron, Sulphate, Calcium, Magnesium, Carbonate, Bi-carbonate, Chloride, Dissolved Oxygen, BOD and COD, are carried out at the Level II laboratory by using standard methodology. Micro biological parameters like total colliform and faecal colliform are also being analyzed. For analysis of trace and toxic elements, samples are sent to Level-II+ laboratory at Hyderabad once in a year, in the month of April.

The following parameters are analyzed and recorded:

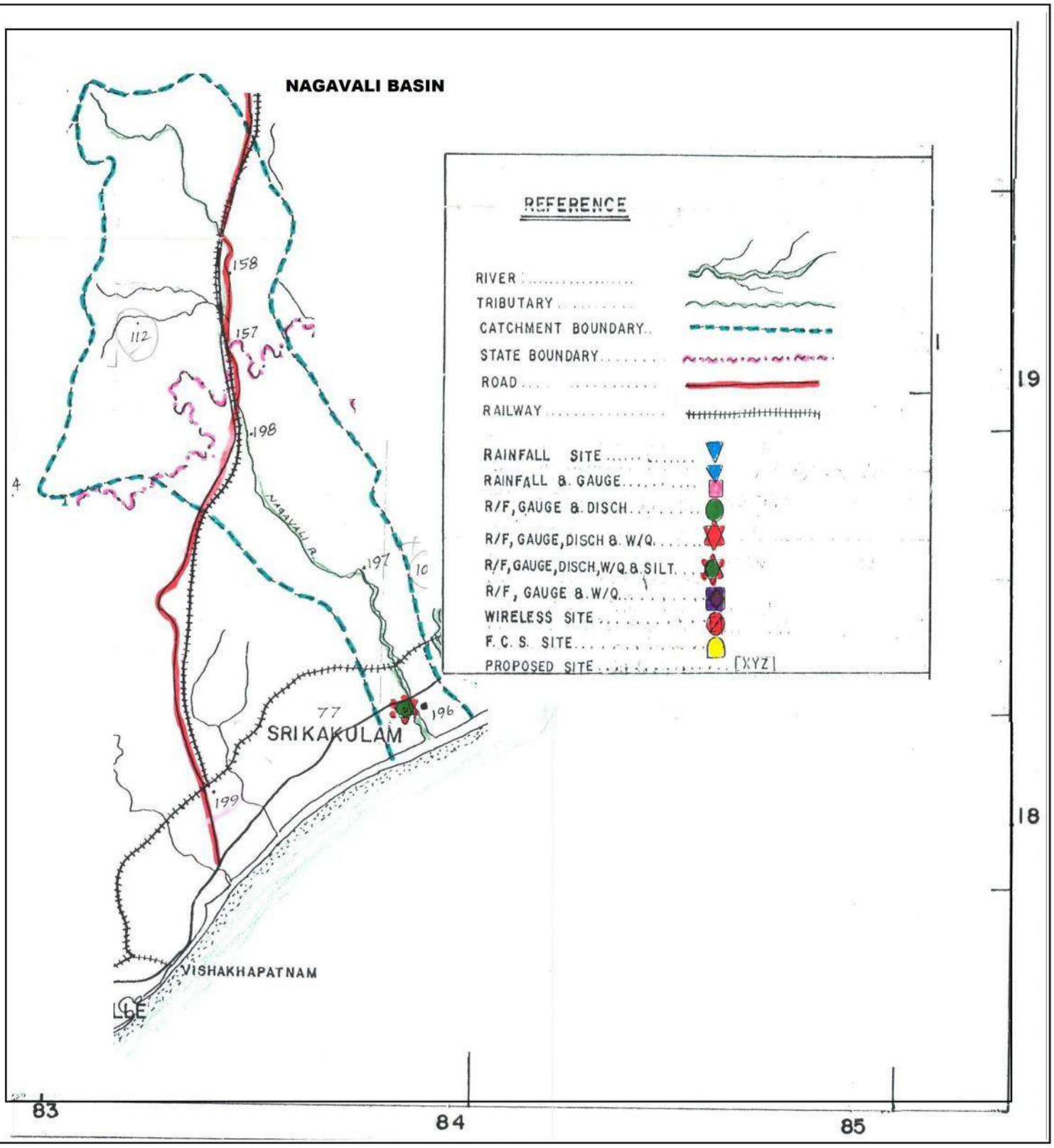
- Monthly Values: Physical; Chemical (mg/l); Biological (mg/l); Traces & Toxic (mg/l) and Chemical Indices.

- Average Values for the Year: 10 Years data to be given season wise averages:-

    - Average for Summer (March to June).
    - Average for Floods (July to October).
    - Average for Winter (November to February)

NAME OF THE SITES IN OPERATION UNDER NAGAVALI BASIN

Sl. No.	Station Name	River/ Tributary	Code No.	Type	Latitude	Longitude
1.	Srikakulam	Nagavali	AN000Y2	GDSQ	18° 18' 48"	83° 53' 18


NAGAVALI BASIN
REFERENCE
RIVER
TRIBUTARY
CATCHMENT BOUNDARY
STATE BOUNDARY
ROAD
RAILWAY
RAINFALL SITE
RAINFALL & GAUGE
R/F, GAUGE & DISCH
R/F, GAUGE, DISCH & W/Q
R/F, GAUGE, DISCH, W/Q & SILT
R/F, GAUGE & W/Q
WIRELESS SITE
F. C. S. SITE
PROPOSED SITE [XYZ]
158
157
112
198
197
196
199
77
10
SRIKAKULAM
VISHAKHAPATNAM
NAGAVALI R.
19
18
4
83
84
85

HISTORY SHEET

Water Year : 2016-2017

Site	**:**	**SRIKAKULAM**	**Code**	**:**	**AN000Y2**
State	:	Andhra Pradesh	District		Srikakulam
Basin	:	EFR B Mahanadi-Godavari	Independent River	:	Nagavali
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Nagavali
Division	:	E.E., Bhubaneswar	Sub-Division	:	Behrampur
Drainage Area	:	9500 Sq. Km.	Bank	:	Left
Latitude	:	18°18'48"	Longitude	:	83°53'18"
Zero of Gauge (m)	:	6.65 (m.s.l)	1/1/1988	-	1/12/2090
		Opening Date	Closing Date		
Gauge	:	2/16/1988			
Discharge	:	8/25/1990			
Sediment	:	6/27/2001			
Water Quality	:	6/27/2001			

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1991-1992	1497	10.935	7/30/1991	0.870	8.050	5/22/1992
1992-1993	2013	11.530	7/28/1992	0.075	7.880	4/12/1993
1993-1994	337.5	9.790	7/14/1993	0.000	8.070	4/5/1994
1994-1995	1917	11.410	5/11/1995	0.000	8.040	5/6/1995
1995-1996	1128	10.760	9/1/1995	1.052	8.030	3/18/1996
1996-1997	1284	10.740	8/23/1996	0.080	7.945	3/25/1997
1997-1998	577.8	10.155	9/18/1997	0.240	7.865	4/23/1998
1998-1999	451.1	9.950	11/11/1998	0.000	7.775	4/28/1999
1999-2000	370.3	9.720	9/9/1999	0.000	7.790	4/5/2000
2000-2001	852.9	10.637	8/25/2000	0.000	7.735	3/12/2001
2001-2002	758.8	10.200	7/7/2001	0.355	7.875	3/20/2002
2002-2003	301.2	9.490	10/17/2002	0.000	7.630	4/29/2003
2003-2004	1087	10.785	10/8/2003	0.000	7.780	6/14/2003
2004-2005	658.6	10.350	8/5/2004	0.120	7.930	5/23/2005
2005-2006	796.3	10.470	9/21/2005	0.106	7.500	4/16/2006
2006-2007	5625	14.085	8/4/2006	3.579	7.660	3/9/2007
2007-2008	1014	11.000	8/7/2007	3.960	7.950	5/13/2008
2008-2009	1703	11.035	9/18/2008	0.055	7.320	4/30/2009
2009-2010	1375	10.740	7/14/2009	0.554	7.690	4/25/2010
2010-2011	1339	10.640	12/9/2010	4.942	7.990	3/22/2011
2011-2012	1443	10.820	9/2/2011	2.583	7.600	3/15/2012
2012-2013	1900	11.030	11/4/2012	0.061	7.450	4/19/2013
2013-2014	2142	11.375	10/28/2013	1.058	7.400	4/30/2014
2014-2015	4224	12.610	10/14/2014	3.029	7.390	3/3/2015
2015-2016	1200	10.670	9/17/2015	0.280	7.150	2/25/2016
2016-2017	772.1	10.530	9/24/2016	0.060	7.230	4/25/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	7.350	2.178	8.730	218.7	8.900	311.3	8.300	117.9	8.870	225.7	7.780	24.22
2	7.340	1.964	8.690	205.4	8.850	200.7	8.590	162.3	9.440	438.0 *	7.820	28.29
3	7.360	2.399	8.350	146.0 *	8.870	222.8	8.430	127.0	9.000	272.1	7.910	34.29
4	7.410	3.730	8.475	167.9	8.565	179.5	8.340	110.0 *	9.320	324.7	8.050	57.70
5	7.450	5.000 *	8.305	136.4	8.330	139.8	8.765	192.6	8.820	214.2	7.990	43.43
6	7.410	3.518	8.010	57.08	8.410	151.8	8.940	232.0	8.600	164.0	7.950	39.00 *
7	7.390	2.933	7.920	44.00 *	9.260	321.5 *	8.630	167.9	9.030	283.6	7.890	32.18
8	7.370	2.941	7.750	21.47	8.700	178.9	8.500	130.3	9.260	310.5	7.830	29.93
9	7.410	3.873	7.660	16.09	8.520	138.0	8.300	99.75	8.770	248.0 *	7.690	18.94
10	7.440	4.564	8.190	81.00 *	8.530	139.7	8.140	69.51	9.430	332.0 *	7.690	19.00
11	7.410	3.749	8.100	73.97	8.385	120.3	8.320	111.0 *	9.370	325.0 *	7.640	14.65
12	7.370	2.000 *	8.350	146.8	8.240	99.38	8.580	165.1	8.800	251.0 *	7.620	13.87
13	7.350	2.226	8.440	157.2	8.120	60.22	9.050	288.0 *	8.610	169.3	7.570	10.00 *
14	7.340	1.954	8.050	59.46	8.000	47.83 *	8.990	276.1	8.470	129.5	7.750	23.00 *
15	7.320	1.697	7.910	39.95	8.150	63.34 *	8.950	258.3	8.270	101.0	7.710	20.07
16	7.290	1.285	7.840	32.61	7.950	42.65	9.900	611.7	8.190	84.00 *	7.630	14.98
17	7.270	1.209	7.910	42.00 *	7.970	43.76	8.790	229.2	8.430	135.5	7.610	13.43
18	7.250	1.117	7.870	36.53	7.800	20.86	8.650	193.0 *	8.320	125.3	7.600	11.87
19	7.250	1.000 *	7.965	46.46	7.855	22.89	8.680	200.8	8.100	66.11	7.550	10.85
20	7.260	1.206	7.930	41.21	8.090	64.29	8.740	218.6	7.860	31.00	7.570	12.00 *
21	7.250	1.128	7.910	38.39	7.960	42.00 *	8.750	221.2	7.710	23.01	7.820	29.83
22	7.240	0.971	7.950	47.82	7.920	35.71	9.090	300.5	7.820	29.44	7.810	27.58
23	7.230	0.930	8.750		7.870	24.84	9.320	321.7	7.900	37.00 *	7.770	21.21
24	7.220	0.906	8.990	272.8 *	7.800	18.97	10.530	772.1	7.930	40.01	7.870	30.05
25	7.210	0.921	8.550		7.770	16.93	9.760	511.3 *	7.810	28.54	7.850	29.13
26	7.210	1.000 *	8.250	95.09	7.940	41.62	8.970	260.7	7.790	26.65	7.890	32.41
27	7.280		8.250		8.000	46.64	8.830	217.7	7.850	30.29	7.860	31.00 *
28	7.310	1.400	8.670	185.7	8.320	105.0 *	8.710	206.6	7.790	26.47	7.810	27.34
29	8.100	70.59	8.430	153.5	8.560	148.7	8.860	225.8	8.100	66.41	7.780	22.94
30	8.160	83.75	8.170	89.51	8.610	169.4	8.480	128.6	8.020	56.00 *	7.620	14.03
31			8.000	47.00 *	8.230	83.59			7.795	26.16		
Ten-Daily Mean												
I Ten-Daily	7.393	3.310	8.208	109.4	8.693	198.4	8.493	140.9	9.054	281.3	7.860	32.70
II Ten-Daily	7.311	1.744	8.036	67.62	8.056	58.55	8.865	255.2	8.442	141.8	7.625	14.47
III Ten-Daily	7.421	17.96	8.356	116.2	8.089	66.67	9.130	316.6	7.865	35.45	7.808	26.55
Monthly												
Min.	7.210	0.906	7.660	16.09	7.770	16.93	8.140	69.51	7.710	23.01	7.550	10.00
Max.	8.160	83.75	8.990	272.8	9.260	321.5	10.530	772.1	9.440	438.0	8.050	57.70
Mean	7.375	7.315	8.205	96.43	8.273	106.5	8.830	237.6	8.435	149	7.764	24.57

Annual Runoff in MCM = 1728 Annual Runoff in mm = 182

Peak Observed Discharge = 772.1 cumecs on 24/09/2016 Corres. Water Level :10.53 m

Lowest Observed Discharge = 0.060 cumecs on 25/04/2017 Corres. Water Level :7.23 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	7.600	12.37	7.710	14.00 *	7.460	2.800	7.600	8.760	7.370	1.808	7.540	6.347
2	7.730	18.97	7.640	10.69	7.460	2.517	7.600	8.384	7.370	2.000 *	7.540	6.225
3	7.650	14.07	7.640	10.19	7.450	2.301	7.620	9.018	7.380	2.208	7.550	6.604
4	7.620	8.000 *	7.620	8.926	7.530	5.413	7.620	9.647	7.380	2.037	7.590	8.023
5	7.580	11.25	7.750	19.72	7.550	5.380 *	7.620	9.718 *	7.380	2.111	7.600	8.517
6	7.560	9.071	7.730	14.54	7.530	5.027	7.600	8.235	7.370	1.667	7.520	7.670
7	7.540	7.253	7.700	13.28	7.520	4.566	7.590	7.607	7.360	1.558	7.510	7.248 *
8	7.540	7.503	7.680	10.00 *	7.520	4.310	7.600	8.387	7.360	1.590	7.430	3.966
9	7.750	20.28	7.750	20.28	7.520	4.097	7.620	9.830	7.360	1.506 *	7.420	3.221
10	7.730	12.67	7.790	21.50	7.520	4.102	7.630	9.896	7.360	1.544	7.410	3.000 *
11	7.770	18.00 *	7.700	12.95	7.520	4.159	7.630	9.576	7.350	1.275	7.420	3.317
12	7.790	20.00 *	7.660	9.766	7.540	4.700 *	7.630	9.817 *	7.380	2.003	7.410	3.045
13	7.800	21.40	7.610	7.836	7.480	3.083	7.600	9.087 *	7.380	2.152	7.390	2.896
14	7.790	19.84	7.580	6.621	7.480	3.112	7.510	6.635	7.380	2.000 *	7.390	3.000 *
15	7.730	12.61	7.780	21.00 *	7.460	2.558	7.500	6.121	7.370	1.869	7.420	3.152
16	7.630	9.323	7.780	18.02	7.460	2.525	7.480	5.612	7.360	1.612 *	7.410	3.122
17	7.620	8.943	7.830	22.85	7.450	2.014	7.490	6.198	7.350	1.351	7.390	3.013
18	7.610	12.00 *	7.790	17.60	7.440	1.947	7.490	6.455	7.330	1.212	7.350	2.851
19	7.820	22.08	7.660	9.672	7.430	1.955 *	7.480	6.225 *	7.300	0.548	7.400	3.032
20	7.860	24.72	7.620	8.609	7.430	1.990	7.600	8.965	7.300	0.529	7.420	3.328
21	7.810	20.11	7.540	6.492	7.430	1.859	7.520	7.228	7.250	0.066	7.410	3.229 *
22	7.790	18.46	7.420	1.761	7.420	1.761	7.490	6.039	7.250	0.066	7.380	2.963
23	7.730	12.54	7.670	10.60	7.420	1.792	7.510	6.641	7.250	0.067 *	7.350	2.652
24	7.730	12.09	7.670	10.64	7.420	1.681 *	7.480	5.510	7.240	0.065	7.340	2.609
25	7.720	12.00 *	7.570	6.598	7.590	7.551	7.460	4.871	7.230	0.060	7.320	2.450
26	7.660	9.080			7.610	8.000 *	7.470	5.485 *	7.460	4.169	7.270	2.084
27	7.780	17.44	7.520	4.501	7.590	7.469	7.430	3.081	7.460	3.861	7.290	2.179
28	7.830	23.17	7.510	4.194	7.600	8.476	7.420	2.920	7.450	3.599	7.280	2.100 *
29	7.850	24.63	7.530	5.000 *			7.400	2.508	7.440	3.358	7.340	2.585
30	7.830	22.77	7.470	2.948			7.370	2.018	7.440	3.000 *	7.350	2.714
31	7.750	15.99	7.460	2.813			7.380	2.287			7.380	2.831
Ten-Daily Mean												
I Ten-Daily	7.630	12.14	7.701	14.31	7.506	4.051	7.610	8.948	7.369	1.803	7.511	6.082
II Ten-Daily	7.742	16.89	7.701	13.49	7.469	2.804	7.541	7.469	7.350	1.455	7.400	3.076
III Ten-Daily	7.771	17.12	7.536	5.554	7.510	4.824	7.448	4.417	7.347	1.831	7.337	2.581
Monthly												
Min.	7.540	7.253	7.420	1.761	7.420	1.681	7.370	2.018	7.230	0.060	7.270	2.084
Max.	7.860	24.72	7.830	22.85	7.610	8.476	7.630	9.896	7.460	4.169	7.600	8.517
Mean	7.716	15.44	7.646	11.12	7.494	3.827	7.530	6.863	7.355	1.696	7.414	3.87

Peak Computed Discharge = 511.3 cumecs on 25/09/2016 Corres. Water Level :9.76 m

Lowest Computed Discharge = 0.067 cumecs on 23/04/2017 Corres. Water Level :7.25 m

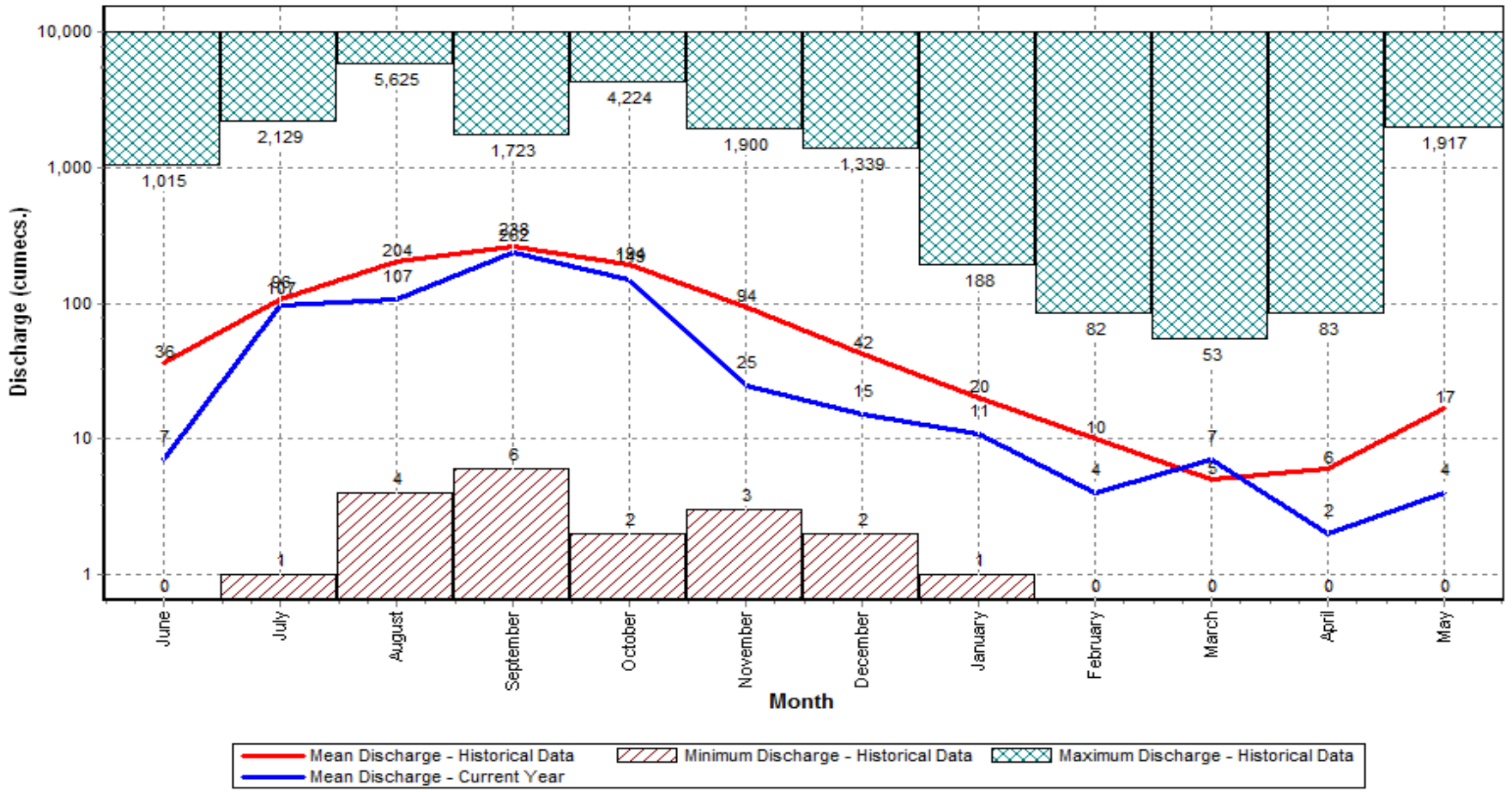
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

HISTOGRAM - HYDROGRAPH for Water Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Data considered : 1991-2017** **Division : E.E., Bhubaneswar**

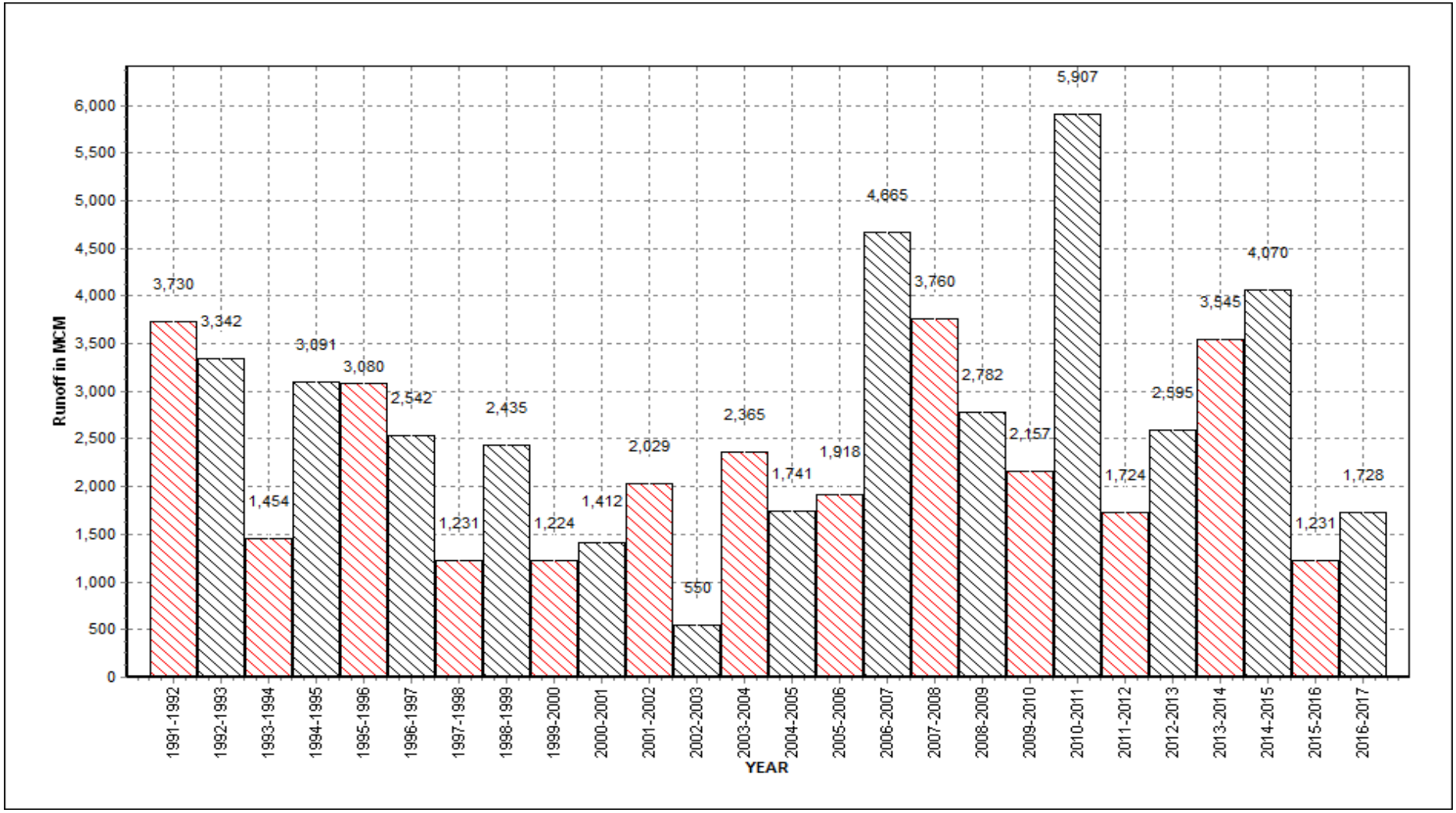
Local River : Nagavali **Sub-Division : Behrampur**



Annual Runoff Values for the period: 1991 - 2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**



Note: Missing values have not been considered while arriving at Annual Runoff

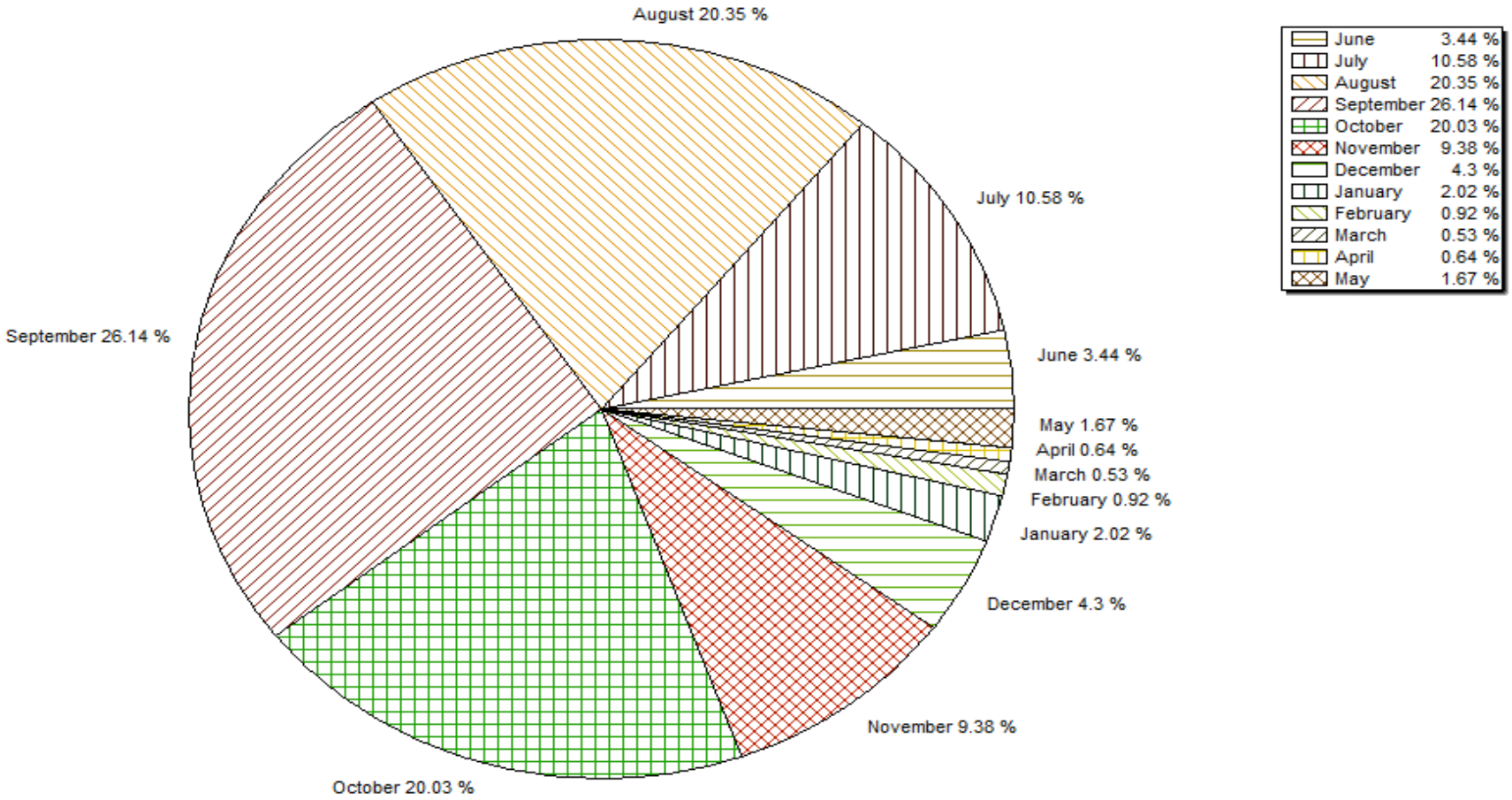
Monthly Average Runoff based on period : 1991-2016

Station Name : SRIKAKULAM (AN000Y2)

Local River : Nagavali

Division : E.E., Bhubaneswar

Sub-Division : Behrampur



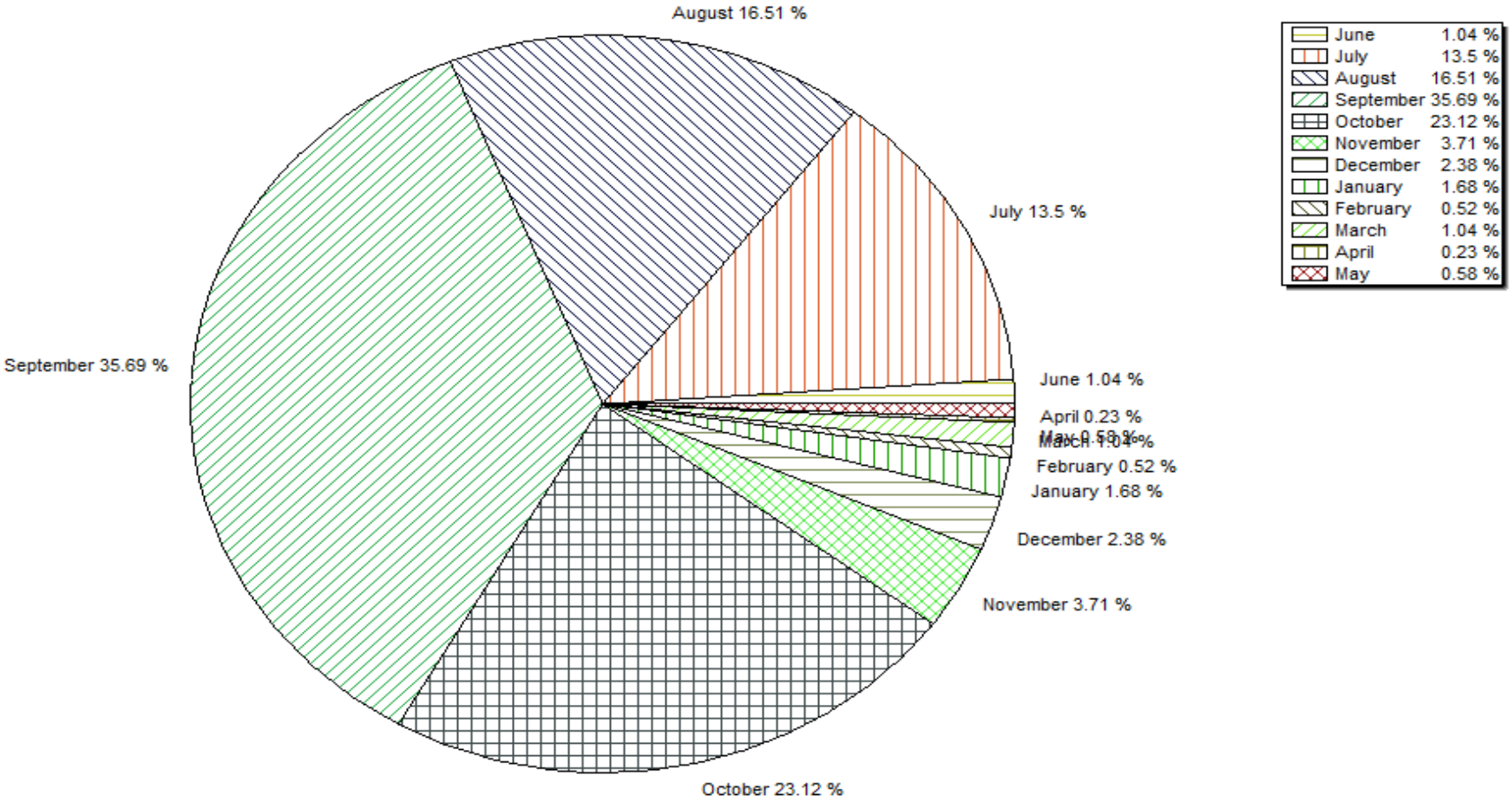
Monthly Runoff for the Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2)

Local River : Nagavali

Division : E.E., Bhubaneswar

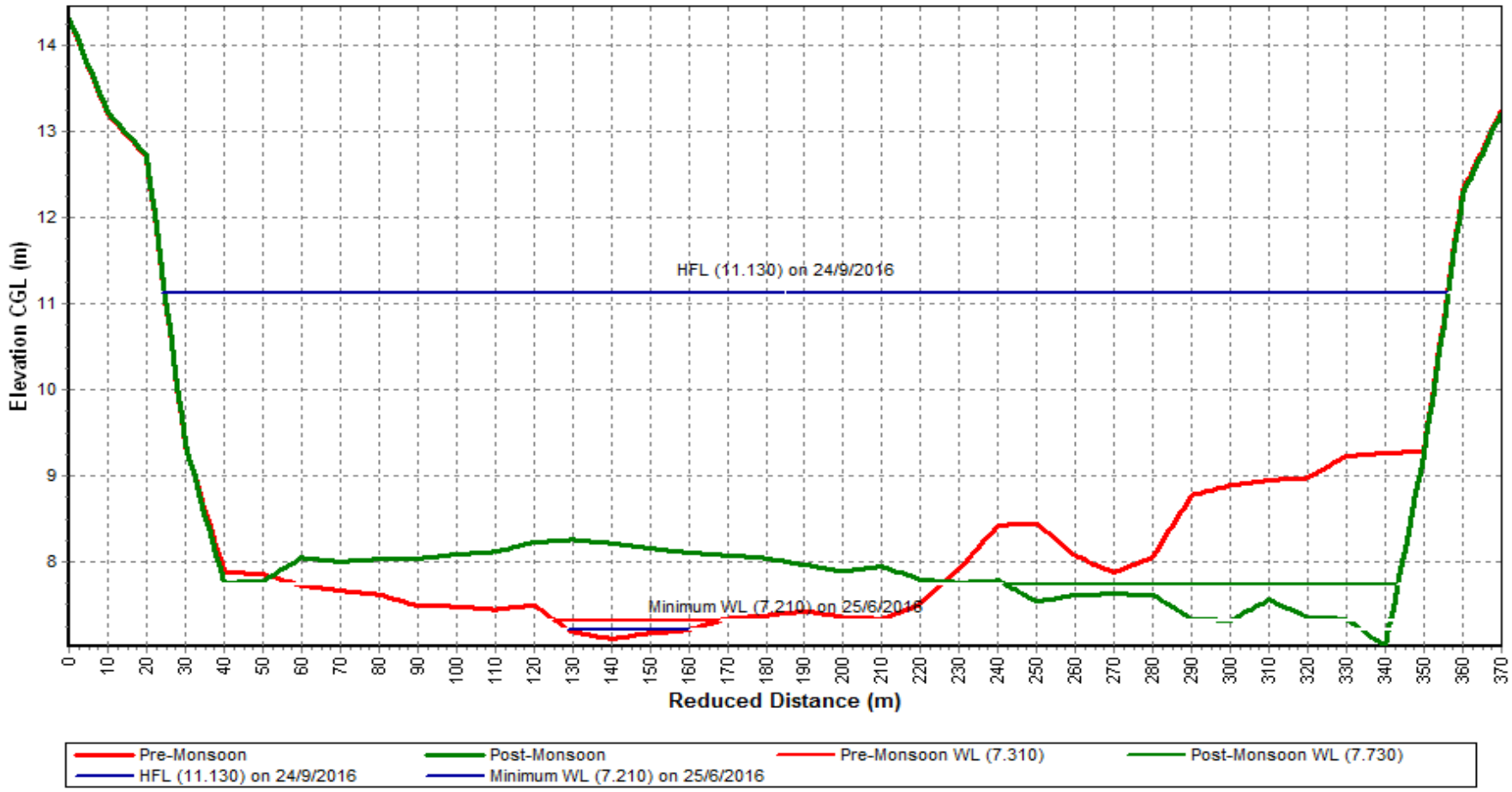
Sub-Division : Behrampur



Pre-Monsoon & Post-Monsoon X-Section for Water Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

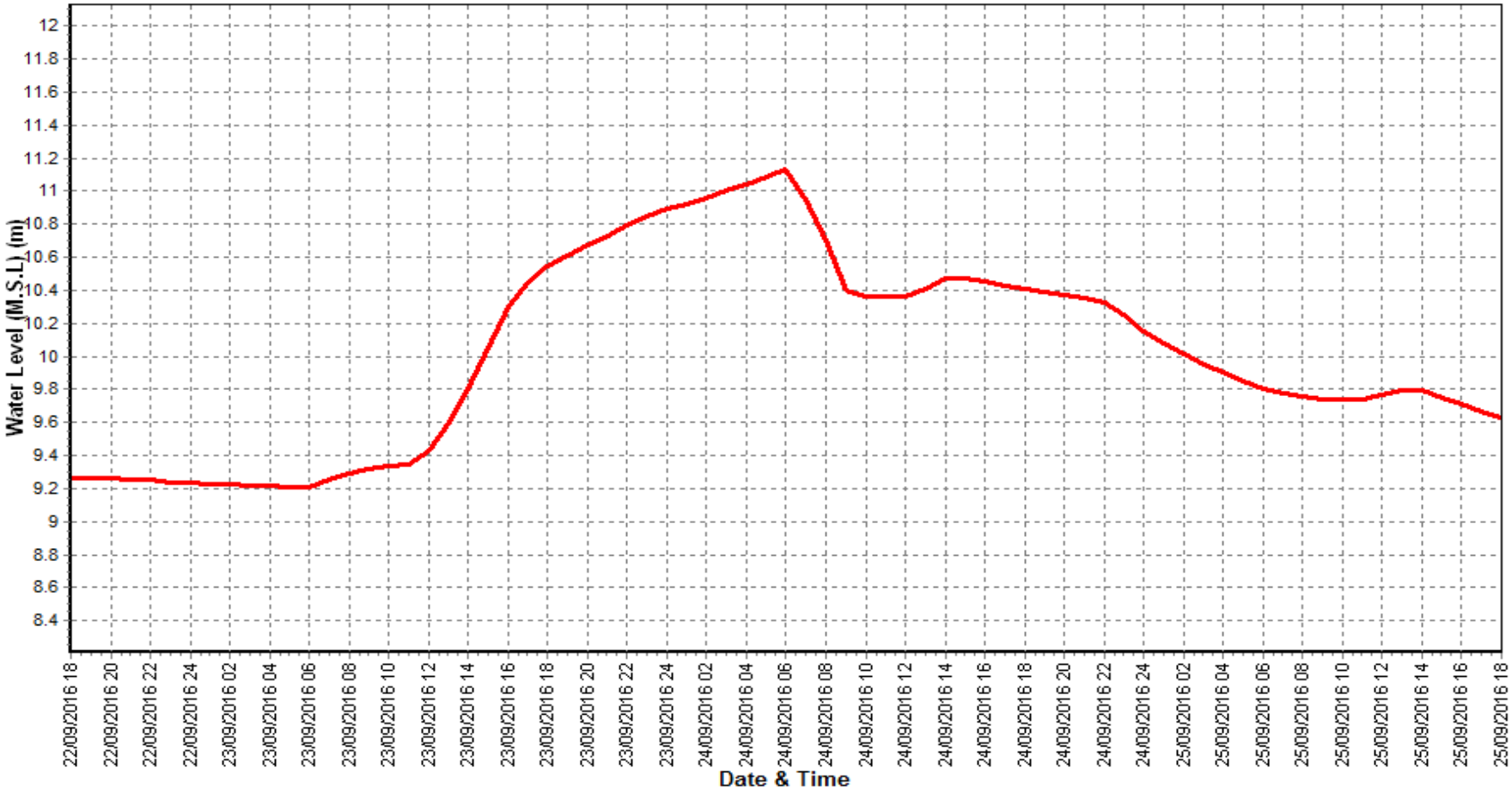
Local River : Nagavali **Sub-Division : Behrampur**



Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

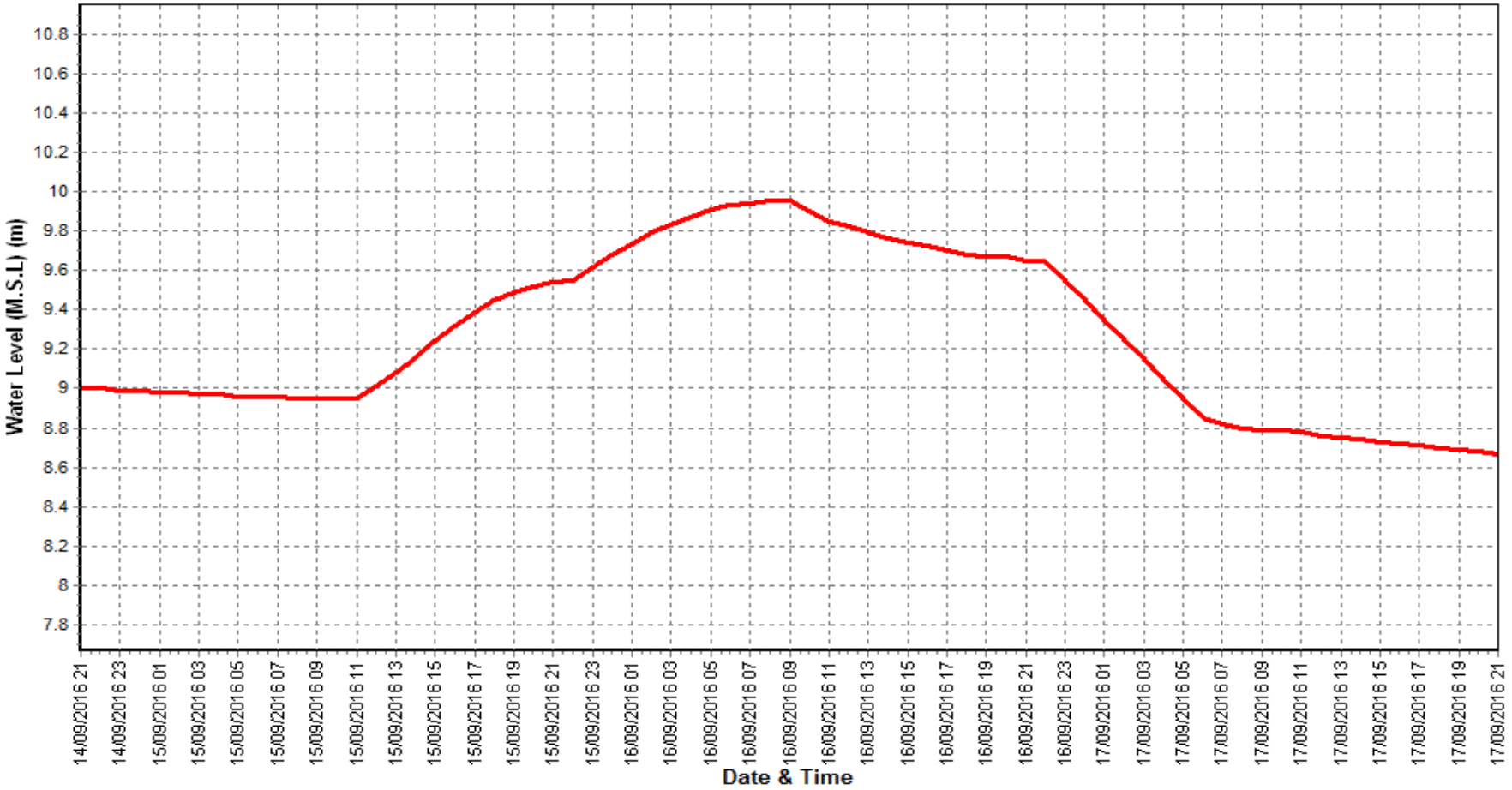


Time Span: 72 Hrs

Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

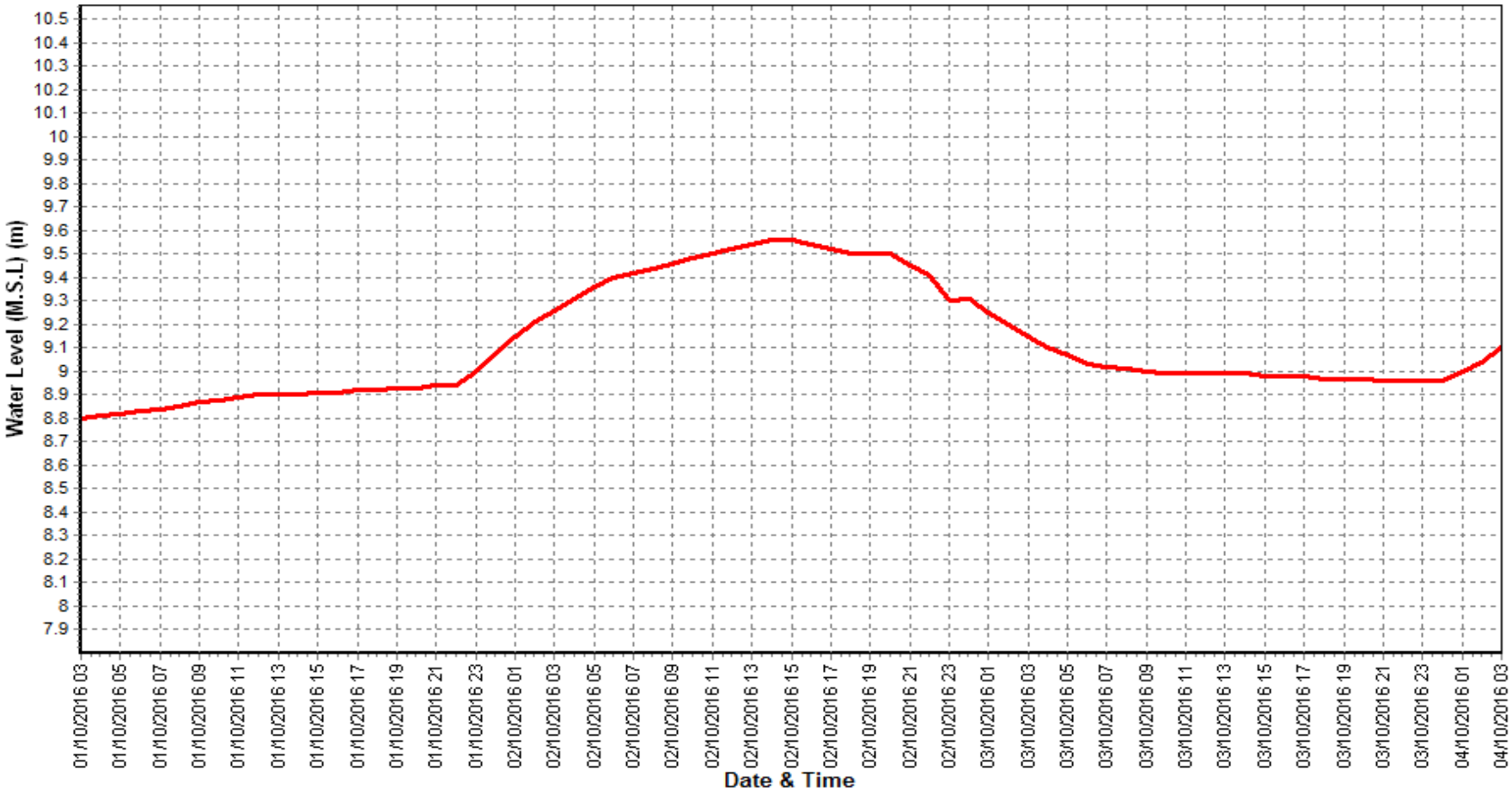


Time Span: 72 Hrs

Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**



Time Span: 72 Hrs

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Jun						Jul						Aug					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	2.178	0.000	0.000	0.000	0.000	0	218.7	0.014	0.020	0.249	0.283	5343	311.3	0.030	0.040	0.357	0.427	11492
2	1.964	0.000	0.000	0.000	0.000	0	205.4	0.013	0.019	0.259	0.291	5165	200.7	0.014	0.020	0.251	0.285	4941
3	2.399	0.000	0.000	0.000	0.000	0	146.0	0.011	0.018	0.177	0.206	2600	222.8	0.015	0.021	0.254	0.289	5564
4	3.730	0.000	0.000	0.000	0.000	0	167.9	0.012	0.020	0.207	0.238	3458	179.5	0.011	0.018	0.223	0.252	3904
5	5.000	0.000	0.000	0.000	0.000	0	136.4	0.008	0.014	0.168	0.190	2242	139.8	0.008	0.014	0.171	0.193	2335
6	3.518	0.000	0.000	0.000	0.000	0	57.08	0.000	0.000	0.048	0.048	235	151.8	0.008	0.015	0.184	0.207	2717
7	2.933	0.000	0.000	0.000	0.000	0	44.00	0.000	0.000	0.045	0.045	171	321.5	0.023	0.028	0.406	0.457	12705
8	2.941	0.000	0.000	0.000	0.000	0	21.47	0.000	0.000	0.040	0.040	74	178.9	0.013	0.019	0.263	0.295	4558
9	3.873	0.000	0.000	0.000	0.000	0	16.09	0.000	0.000	0.036	0.036	50	138.0	0.009	0.016	0.169	0.194	2308
10	4.564	0.000	0.000	0.000	0.000	0	81.00	0.000	0.000	0.067	0.067	469	139.7	0.010	0.017	0.171	0.197	2380
11	3.749	0.000	0.000	0.000	0.000	0	73.97	0.000	0.000	0.064	0.064	407	120.3	0.008	0.015	0.148	0.171	1773
12	2.000	0.000	0.000	0.000	0.000	0	146.8	0.009	0.015	0.180	0.204	2586	99.38	0.010	0.020	0.074	0.104	890
13	2.226	0.000	0.000	0.000	0.000	0	157.2	0.010	0.017	0.194	0.221	3002	60.22	0.000	0.000	0.051	0.051	266
14	1.954	0.000	0.000	0.000	0.000	0	59.46	0.000	0.000	0.050	0.050	256	47.83	0.000	0.000	0.040	0.040	166
15	1.697	0.000	0.000	0.000	0.000	0	39.95	0.000	0.000	0.044	0.044	152	63.34	0.000	0.000	0.054	0.054	294
16	1.285	0.000	0.000	0.000	0.000	0	32.61	0.000	0.000	0.042	0.042	117	42.65	0.000	0.000	0.036	0.036	131
17	1.209	0.000	0.000	0.000	0.000	0	42.00	0.000	0.000	0.042	0.042	154	43.76	0.000	0.000	0.037	0.037	139
18	1.117	0.000	0.000	0.000	0.000	0	36.53	0.000	0.000	0.042	0.042	132	20.86	0.000	0.000	0.000	0.000	0
19	1.000	0.000	0.000	0.000	0.000	0	46.46	0.000	0.000	0.046	0.046	184	22.89	0.000	0.000	0.000	0.000	0
20	1.206	0.000	0.000	0.000	0.000	0	41.21	0.000	0.000	0.045	0.045	160	64.29	0.000	0.000	0.000	0.000	0
21	1.128	0.000	0.000	0.000	0.000	0	38.39	0.000	0.000	0.042	0.042	140	42.00	0.000	0.000	0.000	0.000	0
22	0.971	0.000	0.000	0.000	0.000	0	47.82	0.000	0.000	0.046	0.046	190	35.71	0.000	0.000	0.000	0.000	0
23	0.930	0.000	0.000	0.000	0.000	0		0.015	0.014	0.251	0.279		24.84	0.000	0.000	0.000	0.000	0
24	0.906	0.000	0.000	0.000	0.000	0	272.8	0.018	0.021	0.305	0.344	8101	18.97	0.000	0.000	0.000	0.000	0
25	0.921	0.000	0.000	0.000	0.000	0		0.009	0.015	0.169	0.193		16.93	0.000	0.000	0.000	0.000	0
26	1.000	0.000	0.000	0.000	0.000	0	95.09	0.010	0.022	0.072	0.104	850	41.62	0.000	0.000	0.000	0.000	0
27		0.000	0.000	0.000	0.000			0.008	0.012	0.165	0.184		46.64	0.000	0.000	0.000	0.000	0
28	1.400	0.000	0.000	0.000	0.000	0	185.7	0.012	0.019	0.228	0.259	4152	105.0	0.006	0.011	0.128	0.144	1309
29	70.59	0.000	0.000	0.062	0.062	376	153.5	0.009	0.015	0.190	0.214	2840	148.7	0.008	0.015	0.181	0.204	2615
30	83.75	0.000	0.000	0.071	0.071	512	89.51	0.009	0.018	0.068	0.095	732	169.4	0.009	0.017	0.205	0.230	3372
31							47.00	0.004	0.014	0.014	0.032	129	83.59	0.004	0.008	0.062	0.074	535
Ten Daily Mean																		
Ten Daily I	3.310	0.000	0.000	0.000	0.000	0	109.4	0.006	0.009	0.130	0.144	1981	198.4	0.014	0.021	0.245	0.280	5290
Ten Daily II	1.744	0.000	0.000	0.000	0.000	0	67.62	0.002	0.003	0.075	0.080	715	58.55	0.002	0.004	0.044	0.049	366
Ten Daily III	17.96	0.000	0.000	0.013	0.013	99	116.2	0.008	0.014	0.141	0.163	2142	66.67	0.002	0.005	0.052	0.059	712
Monthly Total						889						44091						64395

Annual Sediment Load (Metric Tonnes) : 506725

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Sep						Oct						Nov					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	117.9	0.006	0.010	0.140	0.156	1593	225.7	0.015	0.021	0.259	0.294	5740	24.22	0.000	0.000	0.000	0.000	0
2	162.3	0.012	0.018	0.227	0.257	3601	438.0	0.026	0.029	0.497	0.552	20889	28.29	0.000	0.000	0.000	0.000	0
3	127.0	0.008	0.011	0.157	0.176	1930	272.1	0.017	0.023	0.313	0.353	8304	34.29	0.000	0.000	0.000	0.000	0
4	110.0	0.007	0.009	0.135	0.151	1433	324.7	0.019	0.025	0.365	0.409	11472	57.70	0.000	0.000	0.000	0.000	0
5	192.6	0.012	0.019	0.239	0.271	4502	214.2	0.013	0.019	0.245	0.277	5130	43.43	0.000	0.000	0.000	0.000	0
6	232.0	0.016	0.022	0.286	0.324	6496	164.0	0.010	0.015	0.188	0.213	3022	39.00	0.000	0.000	0.000	0.000	0
7	167.9	0.011	0.017	0.202	0.230	3339	283.6	0.016	0.024	0.322	0.363	8897	32.18	0.000	0.000	0.000	0.000	0
8	130.3	0.007	0.012	0.161	0.179	2018	310.5	0.018	0.025	0.349	0.391	10497	29.93	0.000	0.000	0.000	0.000	0
9	99.75	0.010	0.020	0.123	0.154	1325	248.0	0.015	0.021	0.280	0.316	6769	18.94	0.000	0.000	0.000	0.000	0
10	69.51	0.007	0.014	0.060	0.081	488	332.0	0.019	0.026	0.373	0.418	11985	19.00	0.000	0.000	0.000	0.000	0
11	111.0	0.009	0.016	0.120	0.144	1384	325.0	0.018	0.026	0.365	0.409	11479	14.65	0.000	0.000	0.000	0.000	0
12	165.1	0.011	0.018	0.208	0.237	3381	251.0	0.015	0.021	0.283	0.319	6927	13.87	0.000	0.000	0.000	0.000	0
13	288.0	0.019	0.027	0.329	0.374	9309	169.3	0.011	0.017	0.193	0.221	3225	10.00	0.000	0.000	0.000	0.000	0
14	276.1	0.018	0.026	0.313	0.357	8512	129.5	0.009	0.013	0.146	0.168	1875	23.00	0.000	0.000	0.000	0.000	0
15	258.3	0.017	0.240	0.295	0.552	12308	101.0	0.007	0.013	0.114	0.134	1170	20.07	0.000	0.000	0.000	0.000	0
16	611.7	0.040	0.058	0.659	0.757	39997	84.00	0.006	0.010	0.096	0.112	815	14.98	0.000	0.000	0.000	0.000	0
17	229.2	0.015	0.020	0.281	0.315	6244	135.5	0.010	0.017	0.151	0.178	2087	13.43	0.000	0.000	0.000	0.000	0
18	193.0	0.013	0.017	0.243	0.274	4561	125.3	0.090	0.015	0.142	0.247	2674	11.87	0.000	0.000	0.000	0.000	0
19	200.8	0.013	0.018	0.252	0.283	4901	66.11	0.000	0.000	0.074	0.074	423	10.85	0.000	0.000	0.000	0.000	0
20	218.6	0.014	0.019	0.250	0.283	5344	31.00	0.000	0.000	0.035	0.035	93	12.00	0.000	0.000	0.000	0.000	0
21	221.2	0.014	0.019	0.253	0.287	5481	23.01	0.000	0.000	0.026	0.026	52	29.83	0.000	0.000	0.000	0.000	0
22	300.5	0.020	0.027	0.339	0.385	10007	29.44	0.000	0.000	0.033	0.033	83	27.58	0.000	0.000	0.000	0.000	0
23	321.7	0.022	0.030	0.363	0.415	11531	37.00	0.000	0.000	0.041	0.041	132	21.21	0.000	0.000	0.000	0.000	0
24	772.1	0.054	0.085	0.867	1.005	67063	40.01	0.000	0.000	0.045	0.045	155	30.05	0.000	0.000	0.000	0.000	0
25	511.3	0.036	0.056	0.582	0.674	29770	28.54	0.000	0.000	0.032	0.032	79	29.13	0.000	0.000	0.000	0.000	0
26	260.7	0.017	0.027	0.290	0.334	7522	26.65	0.000	0.000	0.030	0.030	70	32.41	0.000	0.000	0.000	0.000	0
27	217.7	0.014	0.021	0.248	0.283	5314	30.29	0.000	0.000	0.034	0.034	90	31.00	0.000	0.000	0.000	0.000	0
28	206.6	0.014	0.019	0.259	0.292	5206	26.47	0.000	0.000	0.031	0.031	70	27.34	0.000	0.000	0.000	0.000	0
29	225.8	0.016	0.021	0.257	0.294	5741	66.41	0.000	0.000	0.076	0.076	434	22.94	0.000	0.000	0.000	0.000	0
30	128.6	0.010	0.016	0.158	0.184	2042	56.00	0.000	0.000	0.064	0.064	308	14.03	0.000	0.000	0.000	0.000	0
31							26.16	0.000	0.000	0.029	0.029	66						
Ten Daily Mean																		
Ten Daily I	140.9	0.010	0.015	0.173	0.198	2672	281.3	0.017	0.023	0.319	0.359	9270	32.70	0.000	0.000	0.000	0.000	0
Ten Daily II	255.2	0.017	0.046	0.295	0.357	9594	141.8	0.017	0.013	0.160	0.190	3077	14.47	0.000	0.000	0.000	0.000	0
Ten Daily III	316.6	0.022	0.032	0.362	0.415	14968	35.45	0.000	0.000	0.040	0.040	140	26.55	0.000	0.000	0.000	0.000	0
Monthly Total						272340						125010						0

Annual Sediment Load (Metric Tonnes) : 506725

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Dec						Jan						Feb					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	12.37	0.000	0.000	0.000	0.000	0	14.00	0.000	0.000	0.000	0.000	0	2.800	0.000	0.000	0.000	0.000	0
2	18.97	0.000	0.000	0.000	0.000	0	10.69	0.000	0.000	0.000	0.000	0	2.517	0.000	0.000	0.000	0.000	0
3	14.07	0.000	0.000	0.000	0.000	0	10.19	0.000	0.000	0.000	0.000	0	2.301	0.000	0.000	0.000	0.000	0
4	8.000	0.000	0.000	0.000	0.000	0	8.926	0.000	0.000	0.000	0.000	0	5.413	0.000	0.000	0.000	0.000	0
5	11.25	0.000	0.000	0.000	0.000	0	19.72	0.000	0.000	0.000	0.000	0	5.380	0.000	0.000	0.000	0.000	0
6	9.071	0.000	0.000	0.000	0.000	0	14.54	0.000	0.000	0.000	0.000	0	5.027	0.000	0.000	0.000	0.000	0
7	7.253	0.000	0.000	0.000	0.000	0	13.28	0.000	0.000	0.000	0.000	0	4.566	0.000	0.000	0.000	0.000	0
8	7.503	0.000	0.000	0.000	0.000	0	10.00	0.000	0.000	0.000	0.000	0	4.310	0.000	0.000	0.000	0.000	0
9	20.28	0.000	0.000	0.000	0.000	0	20.28	0.000	0.000	0.000	0.000	0	4.097	0.000	0.000	0.000	0.000	0
10	12.67	0.000	0.000	0.000	0.000	0	21.50	0.000	0.000	0.000	0.000	0	4.102	0.000	0.000	0.000	0.000	0
11	18.00	0.000	0.000	0.000	0.000	0	12.95	0.000	0.000	0.000	0.000	0	4.159	0.000	0.000	0.000	0.000	0
12	20.00	0.000	0.000	0.000	0.000	0	9.766	0.000	0.000	0.000	0.000	0	4.700	0.000	0.000	0.000	0.000	0
13	21.40	0.000	0.000	0.000	0.000	0	7.836	0.000	0.000	0.000	0.000	0	3.083	0.000	0.000	0.000	0.000	0
14	19.84	0.000	0.000	0.000	0.000	0	6.621	0.000	0.000	0.000	0.000	0	3.112	0.000	0.000	0.000	0.000	0
15	12.61	0.000	0.000	0.000	0.000	0	21.00	0.000	0.000	0.000	0.000	0	2.558	0.000	0.000	0.000	0.000	0
16	9.323	0.000	0.000	0.000	0.000	0	18.02	0.000	0.000	0.000	0.000	0	2.525	0.000	0.000	0.000	0.000	0
17	8.943	0.000	0.000	0.000	0.000	0	22.85	0.000	0.000	0.000	0.000	0	2.014	0.000	0.000	0.000	0.000	0
18	12.00	0.000	0.000	0.000	0.000	0	17.60	0.000	0.000	0.000	0.000	0	1.947	0.000	0.000	0.000	0.000	0
19	22.08	0.000	0.000	0.000	0.000	0	9.672	0.000	0.000	0.000	0.000	0	1.955	0.000	0.000	0.000	0.000	0
20	24.72	0.000	0.000	0.000	0.000	0	8.609	0.000	0.000	0.000	0.000	0	1.990	0.000	0.000	0.000	0.000	0
21	20.11	0.000	0.000	0.000	0.000	0	6.492	0.000	0.000	0.000	0.000	0	1.859	0.000	0.000	0.000	0.000	0
22	18.46	0.000	0.000	0.000	0.000	0	1.761	0.000	0.000	0.000	0.000	0	1.761	0.000	0.000	0.000	0.000	0
23	12.54	0.000	0.000	0.000	0.000	0	10.60	0.000	0.000	0.000	0.000	0	1.792	0.000	0.000	0.000	0.000	0
24	12.09	0.000	0.000	0.000	0.000	0	10.64						1.681	0.000	0.000	0.000	0.000	0
25	12.00	0.000	0.000	0.000	0.000	0	6.598	0.000	0.000	0.000	0.000	0	7.551	0.000	0.000	0.000	0.000	0
26	9.080	0.000	0.000	0.000	0.000	0							8.000	0.000	0.000	0.000	0.000	0
27	17.44	0.000	0.000	0.000	0.000	0	4.501	0.000	0.000	0.000	0.000	0	7.469	0.000	0.000	0.000	0.000	0
28	23.17	0.000	0.000	0.000	0.000	0	4.194	0.000	0.000	0.000	0.000	0	8.476	0.000	0.000	0.000	0.000	0
29	24.63	0.000	0.000	0.000	0.000	0	5.000	0.000	0.000	0.000	0.000	0						
30	22.77	0.000	0.000	0.000	0.000	0	2.948	0.000	0.000	0.000	0.000	0						
31	15.99	0.000	0.000	0.000	0.000	0	2.813	0.000	0.000	0.000	0.000	0						
Ten Daily Mean																		
Ten Daily I	12.14	0.000	0.000	0.000	0.000	0	14.31	0.000	0.000	0.000	0.000	0	4.051	0.000	0.000	0.000	0.000	0
Ten Daily II	16.89	0.000	0.000	0.000	0.000	0	13.49	0.000	0.000	0.000	0.000	0	2.804	0.000	0.000	0.000	0.000	0
Ten Daily III	17.12	0.000	0.000	0.000	0.000	0	5.554	0.000	0.000	0.000	0.000	0	4.824	0.000	0.000	0.000	0.000	0
Monthly Total						0						0						0

Annual Sediment Load (Metric Tonnes) : 506725

Daily Observed Sediment Datasheet for period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

Day	Mar						Apr						May					
	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day	Q cumecs.	Coarse g/l	Medium g/l	Fine g/l	Total g/l	Total M.T./day
1	8.760	0.000	0.000	0.000	0.000	0	1.808	0.000	0.000	0.000	0.000	0	6.347	0.000	0.000	0.000	0.000	0
2	8.384	0.000	0.000	0.000	0.000	0	2.000	0.000	0.000	0.000	0.000	0	6.225	0.000	0.000	0.000	0.000	0
3	9.018	0.000	0.000	0.000	0.000	0	2.208	0.000	0.000	0.000	0.000	0	6.604	0.000	0.000	0.000	0.000	0
4	9.647	0.000	0.000	0.000	0.000	0	2.037	0.000	0.000	0.000	0.000	0	8.023	0.000	0.000	0.000	0.000	0
5	9.718	0.000	0.000	0.000	0.000	0	2.111	0.000	0.000	0.000	0.000	0	8.517	0.000	0.000	0.000	0.000	0
6	8.235	0.000	0.000	0.000	0.000	0	1.667	0.000	0.000	0.000	0.000	0	7.670	0.000	0.000	0.000	0.000	0
7	7.607	0.000	0.000	0.000	0.000	0	1.558	0.000	0.000	0.000	0.000	0	7.248	0.000	0.000	0.000	0.000	0
8	8.387	0.000	0.000	0.000	0.000	0	1.590	0.000	0.000	0.000	0.000	0	3.966	0.000	0.000	0.000	0.000	0
9	9.830	0.000	0.000	0.000	0.000	0	1.506	0.000	0.000	0.000	0.000	0	3.221	0.000	0.000	0.000	0.000	0
10	9.896	0.000	0.000	0.000	0.000	0	1.544	0.000	0.000	0.000	0.000	0	3.000	0.000	0.000	0.000	0.000	0
11	9.576	0.000	0.000	0.000	0.000	0	1.275	0.000	0.000	0.000	0.000	0	3.317	0.000	0.000	0.000	0.000	0
12	9.817	0.000	0.000	0.000	0.000	0	2.003	0.000	0.000	0.000	0.000	0	3.045	0.000	0.000	0.000	0.000	0
13	9.087	0.000	0.000	0.000	0.000	0	2.152	0.000	0.000	0.000	0.000	0	2.896	0.000	0.000	0.000	0.000	0
14	6.635	0.000	0.000	0.000	0.000	0	2.000	0.000	0.000	0.000	0.000	0	3.000	0.000	0.000	0.000	0.000	0
15	6.121	0.000	0.000	0.000	0.000	0	1.869	0.000	0.000	0.000	0.000	0	3.152	0.000	0.000	0.000	0.000	0
16	5.612	0.000	0.000	0.000	0.000	0	1.612	0.000	0.000	0.000	0.000	0	3.122	0.000	0.000	0.000	0.000	0
17	6.198	0.000	0.000	0.000	0.000	0	1.351	0.000	0.000	0.000	0.000	0	3.013	0.000	0.000	0.000	0.000	0
18	6.455	0.000	0.000	0.000	0.000	0	1.212	0.000	0.000	0.000	0.000	0	2.851	0.000	0.000	0.000	0.000	0
19	6.225	0.000	0.000	0.000	0.000	0	0.548	0.000	0.000	0.000	0.000	0	3.032	0.000	0.000	0.000	0.000	0
20	8.965	0.000	0.000	0.000	0.000	0	0.529	0.000	0.000	0.000	0.000	0	3.328	0.000	0.000	0.000	0.000	0
21	7.228	0.000	0.000	0.000	0.000	0	0.066	0.000	0.000	0.000	0.000	0	3.229	0.000	0.000	0.000	0.000	0
22	6.039	0.000	0.000	0.000	0.000	0	0.066	0.000	0.000	0.000	0.000	0	2.963	0.000	0.000	0.000	0.000	0
23	6.641	0.000	0.000	0.000	0.000	0	0.067	0.000	0.000	0.000	0.000	0	2.652	0.000	0.000	0.000	0.000	0
24	5.510	0.000	0.000	0.000	0.000	0	0.065	0.000	0.000	0.000	0.000	0	2.609	0.000	0.000	0.000	0.000	0
25	4.871	0.000	0.000	0.000	0.000	0	0.060	0.000	0.000	0.000	0.000	0	2.450	0.000	0.000	0.000	0.000	0
26	5.485	0.000	0.000	0.000	0.000	0	4.169	0.000	0.000	0.000	0.000	0	2.084	0.000	0.000	0.000	0.000	0
27	3.081	0.000	0.000	0.000	0.000	0	3.861	0.000	0.000	0.000	0.000	0	2.179	0.000	0.000	0.000	0.000	0
28	2.920	0.000	0.000	0.000	0.000	0	3.599	0.000	0.000	0.000	0.000	0	2.100	0.000	0.000	0.000	0.000	0
29	2.508	0.000	0.000	0.000	0.000	0	3.358	0.000	0.000	0.000	0.000	0	2.585	0.000	0.000	0.000	0.000	0
30	2.018	0.000	0.000	0.000	0.000	0	3.000	0.000	0.000	0.000	0.000	0	2.714	0.000	0.000	0.000	0.000	0
31	2.287	0.000	0.000	0.000	0.000	0							2.831	0.000	0.000	0.000	0.000	0
Ten Daily Mean																		
Ten Daily I	8.948	0.000	0.000	0.000	0.000	0	1.803	0.000	0.000	0.000	0.000	0	6.082	0.000	0.000	0.000	0.000	0
Ten Daily II	7.469	0.000	0.000	0.000	0.000	0	1.455	0.000	0.000	0.000	0.000	0	3.076	0.000	0.000	0.000	0.000	0
Ten Daily III	4.417	0.000	0.000	0.000	0.000	0	1.831	0.000	0.000	0.000	0.000	0	2.581	0.000	0.000	0.000	0.000	0
Monthly Total						0						0						0

Annual Sediment Load (Metric Tonnes) : 506725

Annual Sediment Load for period : 2002-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

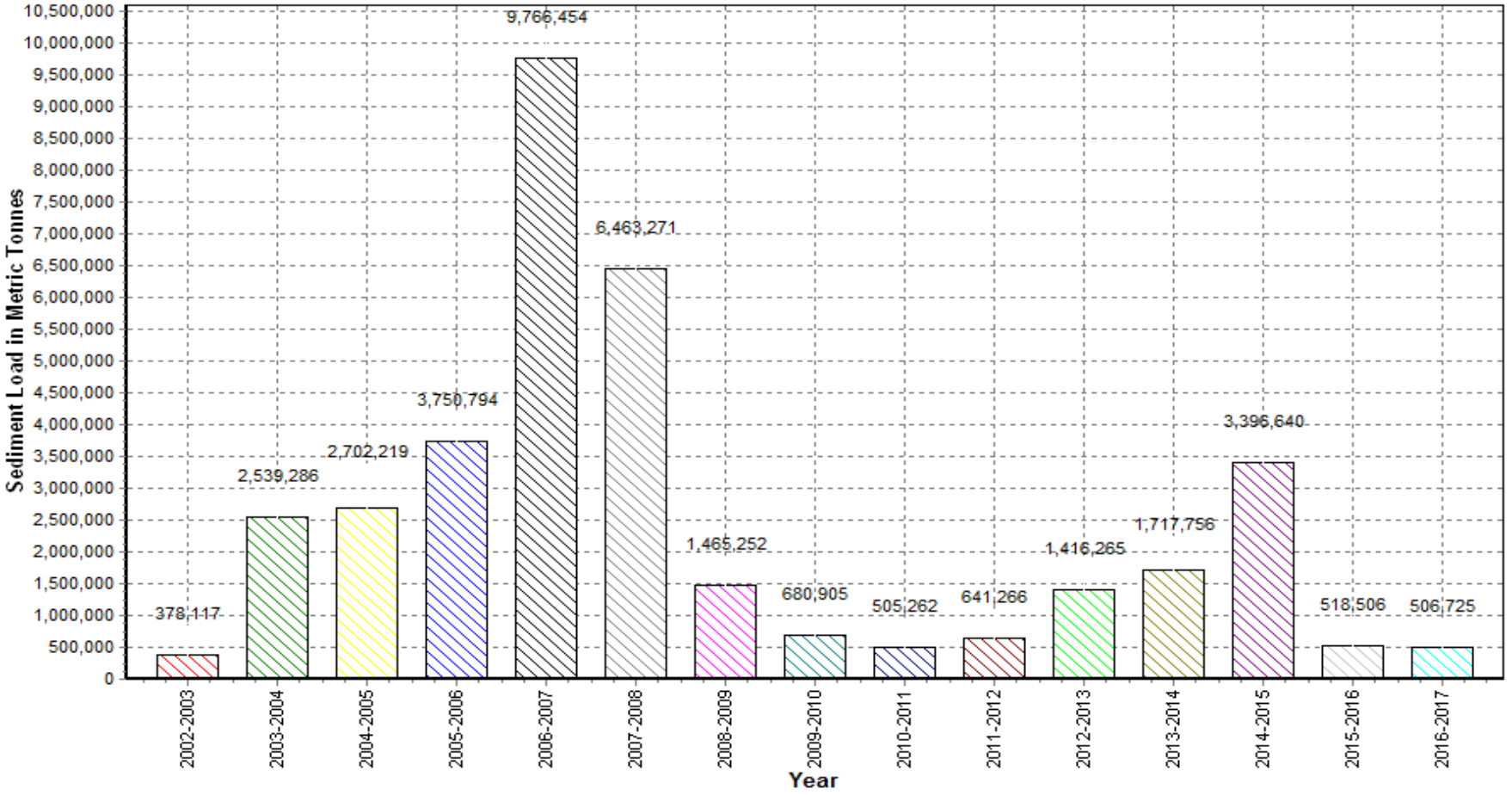
Local River : Nagavali **Sub-Division : Behrampur**

Year	Monsoon (M.T.)	Non-Monsoon (M.T.)	Annual Load (M.T.)	Annual Run Off (MCM)
2002-2003	375944	2174	378117	550
2003-2004	2412284	127002	2539286	2365
2004-2005	2685839	16379	2702219	1741
2005-2006	3742198	8596	3750794	1918
2006-2007	9674341	92114	9766454	4665
2007-2008	6430165	33106	6463271	3760
2008-2009	1429168	36085	1465252	2782
2009-2010	675387	5518	680905	2157
2010-2011	503206	2055	505262	5907
2011-2012	639727	1539	641266	1724
2012-2013	1413063	3202	1416265	2595
2013-2014	1688300	29456	1717756	3535
2014-2015	3379522	17118	3396640	4070
2015-2016	516720	1785	518506	1231
2016-2017	506725	0	506725	1728

Annual Sediment Load for the period: 2002-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**



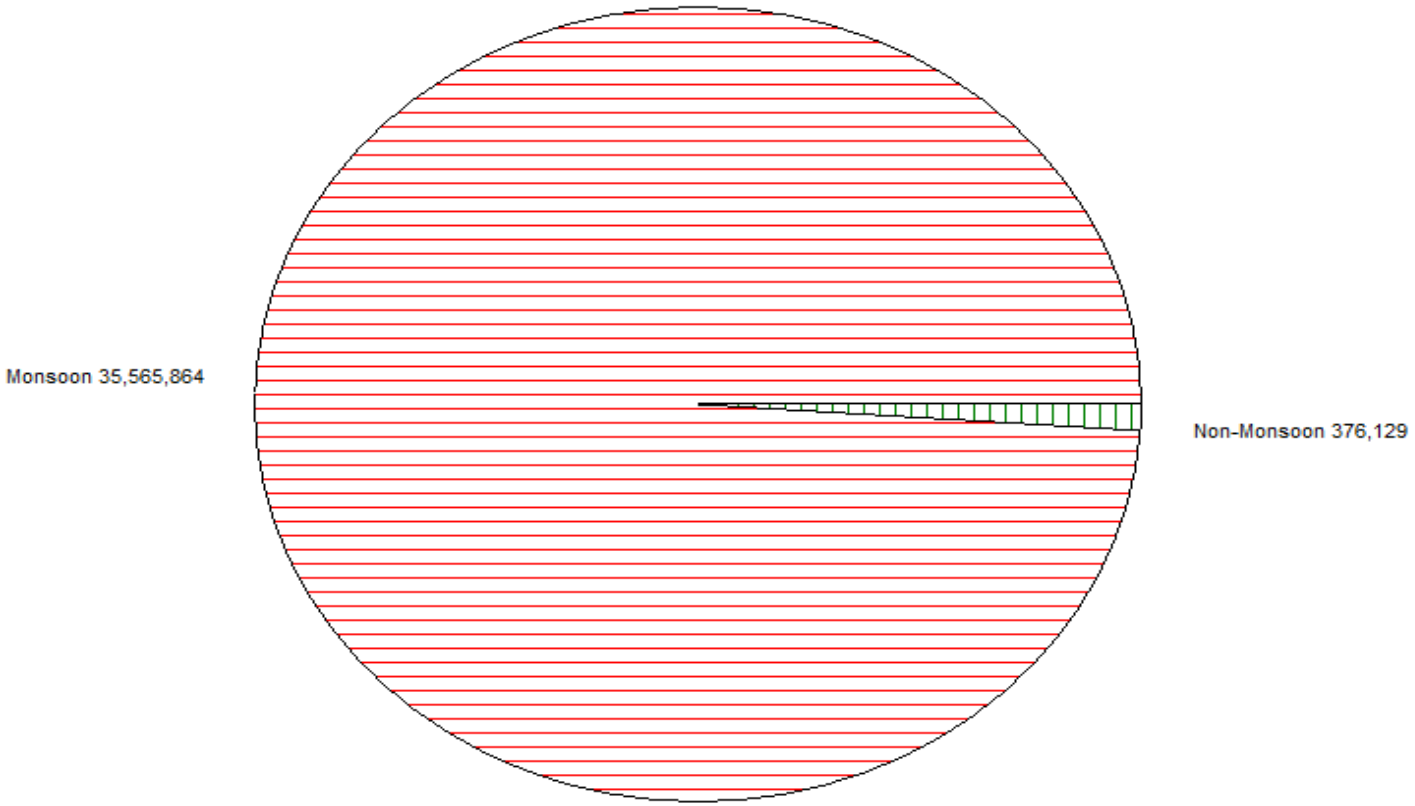
Seasonal Sediment Load for the period : 2002-2016

Station Name : SRIKAKULAM (AN000Y2)

Local River : Nagavali

Division : E.E., Bhubaneswar

Sub-Division : Behrampur



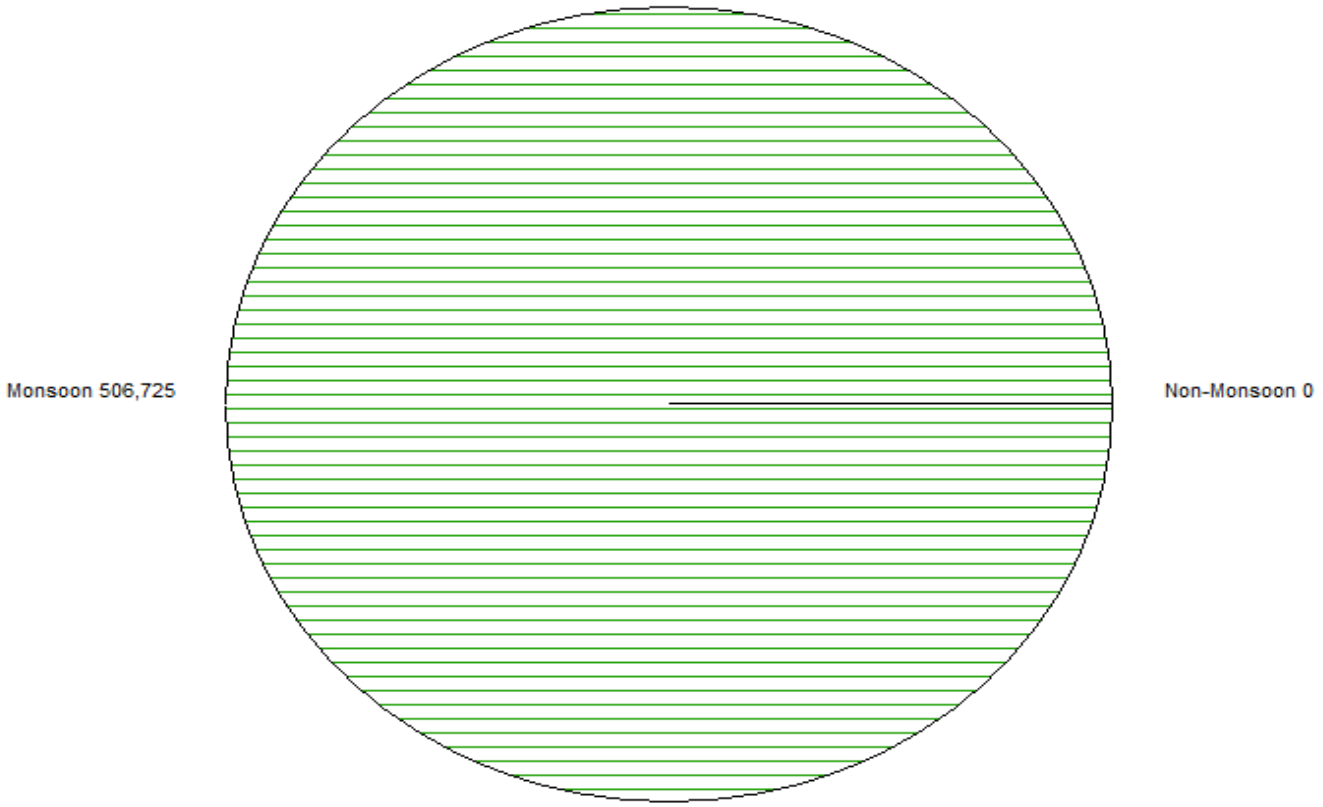
Seasonal Sediment Load for the Year: 2016-2017

Station Name : SRIKAKULAM (AN000Y2)

Division : E.E., Bhubaneswar

Local River : Nagavali

Sub-Division : Behrampur



Water Quality Datasheet for the period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **River Water Analysis** **Sub-Division : Behrampur**

S.No	Parameters	6/1/2016	8/1/2016	10/1/2016	12/1/2016	2/1/2017	4/1/2017
		A	A	A	A	A	A
	PHYSICAL						
1	Q (cumec)						
2	Colour_Cod (-)	Clear	Light Brown	Light Brown	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	441	205	261	920	408	550
4	EC_GEN (µmho/cm)	448	205	269	922	410	551
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	7.1	7.1	7.2	7.3	7.5	8.1
7	pH_GEN (pH units)	7.1	7.2	7.4	7.4	7.5	8.2
8	Temp (deg C)	26.0	24.0	31.0	28.0	27.1	32.5
	CHEMICAL						
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	139	143	125	69	74	79
3	B (mg/L)	0.01	0.01	0.01	0.01	0.01	0.01
4	Ca (mg/L)	59	61	55	56	42	43
5	Cl (mg/L)	35.8	37.7	7.5	9.4	11.3	32.1
6	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)	0.5	1.1	0.8	0.7	3.9	0.7
9	HCO3 (mg/L)	169	175	152	85	90	96
10	K (mg/L)	4.7	10.2	10.1	11.1	17.5	18.6
11	Mg (mg/L)	19.4	20.4	22.4	23.3	23.3	23.3
12	Na (mg/L)	25.8	35.6	53.0	56.0	65.8	44.8
13	NO2+NO3 (mg N/L)	1.18	1.13	0.88	1.40	1.26	1.26
14	NO2-N (mgN/L)	0.00	0.01	0.01	0.03	0.01	0.01
15	NO3-N (mgN/L)	1.18	1.12	0.87	1.37	1.25	1.25
16	P-Tot (mgP/L)	0.010	0.010	0.010	0.010	0.010	0.001
17	SiO2 (mg/L)	7.0	7.0	6.0	6.0	8.0	8.0
18	SO4 (mg/L)	34.2	34.4	1.2	1.2	1.4	1.6
	BIOLOGICAL/BACTERIOLOGICAL						
	TRACE & TOXIC						
	CHEMICAL INDICES						
1	HAR_Ca (mgCaCO3/L)	148	152	136	140	104	108
2	HAR_Total (mgCaCO3/L)	229	237	229	237	201	205
3	Na% (%)	19	24	32	33	39	30
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	0.7	1.0	1.5	1.6	2.0	1.4
	PESTICIDES						

Water Quality Summary for the period : 2016-2017

Station Name : SRIKAKULAM (AN000Y2) **Division : E.E., Bhubaneswar**

Local River : Nagavali **Sub-Division : Behrampur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)				
2	EC_FLD (µmho/cm)	6	920	205	464
3	EC_GEN (µmho/cm)	6	922	205	468
4	pH_FLD (pH units)	6	8.1	7.1	7.4
5	pH_GEN (pH units)	6	8.2	7.1	7.5
6	Temp (deg C)	6	32.5	24.0	28.1
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	143	69	105
3	B (mg/L)	6	0.01	0.01	0.01
4	Ca (mg/L)	6	61	42	53
5	Cl (mg/L)	6	37.7	7.5	22.3
6	CO3 (mg/L)	6	0.0	0.0	0
7	F (mg/L)	6	0.05	0.05	0.05
8	Fe (mg/L)	6	3.9	0.5	1.3
9	HCO3 (mg/L)	6	175	85	128
10	K (mg/L)	6	18.6	4.7	12
11	Mg (mg/L)	6	23.3	19.4	22
12	Na (mg/L)	6	65.8	25.8	46.8
13	NO2+NO3 (mg N/L)	6	1.40	0.88	1.19
14	NO2-N (mgN/L)	6	0.03	0.00	0.01
15	NO3-N (mgN/L)	6	1.37	0.87	1.17
16	P-Tot (mgP/L)	6	0.010	0.001	0.008
17	SiO2 (mg/L)	6	8.0	6.0	7
18	SO4 (mg/L)	6	34.4	1.2	12.3
	BIOLOGICAL/BACTERIOLOGICAL				
	TRACE & TOXIC				
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	152	104	132
2	HAR_Total (mgCaCO3/L)	6	237	201	223
3	Na% (%)	6	39	19	30
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.0	0.7	1.4
	PESTICIDES				

Water Quality Seasonal Average for the period: 2002-2017

Station Name : SRIKAKULAM (AN000Y2) | **Division : E.E., Bhubaneswar**

Local River : Nagavali | **River Water** | **Sub-Division : Behrampur**

S.No	Parameters	Flood																	
		Jun - Oct																	
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002-2003	2003-2004	2004-2005
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)	322	262	330			333		281	355	370	232	291	273	749	302	357	274	365
3	EC_GEN (µmho/cm)	318	260	328			327		281	357	370	232	291	273	747	307	356	270	350
4	pH_FLD (pH units)	7.9	7.3	7.5			7.8		7.5	7.9	8.2	7.7	7.6	7.9	7.5	7.1	7.7	7.5	8.0
5	pH_GEN (pH units)	7.9	7.3	7.6			7.8		7.6	7.8	8.2	7.7	7.6	7.9	7.5	7.2	7.7	7.5	8.0
6	Temp (deg C)	32.2	31.0	30.5			30.0		26.2	25.7	26.0	29.4	27.4	27.3	28.7	27.0	27.0	26.8	25.8
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)						0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0			
2	ALK-TOT (mgCaCO3/L)						123		79	104	136	91		104	75	136			
3	B (mg/L)	0.00	0.00	0.00			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
4	Ca (mg/L)	35	25	26			33		26	29	29	34	20	27	25	58	40	28	34
5	Cl (mg/L)	19.3	24.3	35.0			24.2		25.3	21.0	29.2	23.1	21.7	20.0	16.3	27.0	28.2	21.3	28.2
6	CO3 (mg/L)	0.0	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)	0.00	0.02	0.54			0.58		0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.26	0.08	0.52
8	Fe (mg/L)	0.1	0.1	0.3			0.1		0.0	0.1	0.0		0.4	0.5	0.4	0.8	0.1	0.1	0.2
9	HCO3 (mg/L)	143	95	135			147		97	146	166	111	100	126	92	165	156	119	163
10	K (mg/L)	2.4	2.2	3.1			6.8		3.2	2.4	2.8	4.0	2.0	2.9	3.0	8.3	2.5	2.2	2.4
11	Mg (mg/L)	9.5	6.3	9.3			9.8		8.4	16.2	13.1	7.8	6.6	14.5	13.6	20.7	7.5	7.5	11.7
12	Na (mg/L)	13.7	17.2	24.3			16.4		17.8	13.4	19.8	18.6	13.2	11.5	8.0	38.1	20.4	14.5	19.3
13	NO2+NO3 (mg N/L)	1.95	0.44	0.27			2.04		0.59	2.26	0.36		0.71	0.83	1.15	1.06	1.21	0.64	0.06
14	NO2-N (mgN/L)	0.00	0.00	0.01			0.00		0.00	0.00	0.07		0.01	0.01	0.00	0.01	0.00	0.00	0.00
15	NO3-N (mgN/L)	1.95	0.44	0.26			2.04		0.59	2.26	0.29		0.70	0.82	1.15	1.06	1.21	0.64	0.06
16	o-PO4-P (mg P/L)						0.007		0.033	0.065									
17	P-Tot (mgP/L)	0.066	0.008	0.001			0.001		0.001	0.004	0.010	0.001	0.001	0.001	0.004	0.010	1.321	0.034	0.001
18	SiO2 (mg/L)	10.1	13.4	37.6			16.4		9.2	10.3	9.0	20.0	11.7	4.7	6.0	6.7	9.9	9.9	37.0
19	SO4 (mg/L)	6.8	6.8	5.8			7.7		13.8	14.5	12.2	11.4	23.1	8.9	16.6	23.3	5.5	5.3	4.1
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)	88	62	66			83		65	73	72	86	49	67	63	146	100	70	86
2	HAR_Total (mgCaCO3/L)	128	88	100			126		100	141	127	119	76	127	119	232	131	101	131
3	Na% (%)	18	32	33			22		26	17	25	25	28	16	12	25	25	23	23
4	RSC (-)	0.0	0.0	0.2			0.1		0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
5	SAR (-)	0.5	0.8	1.1			0.7		0.7	0.5	0.8	0.7	0.7	0.5	0.3	1.1	0.8	0.6	0.7
	PESTICIDES																		

Water Quality Seasonal Average for the period: 2002-2017

Station Name : SRIKAKULAM (AN000Y2) | **Division : E.E., Bhubaneswar**

Local River : Nagavali | **River Water** | **Sub-Division : Behrampur**

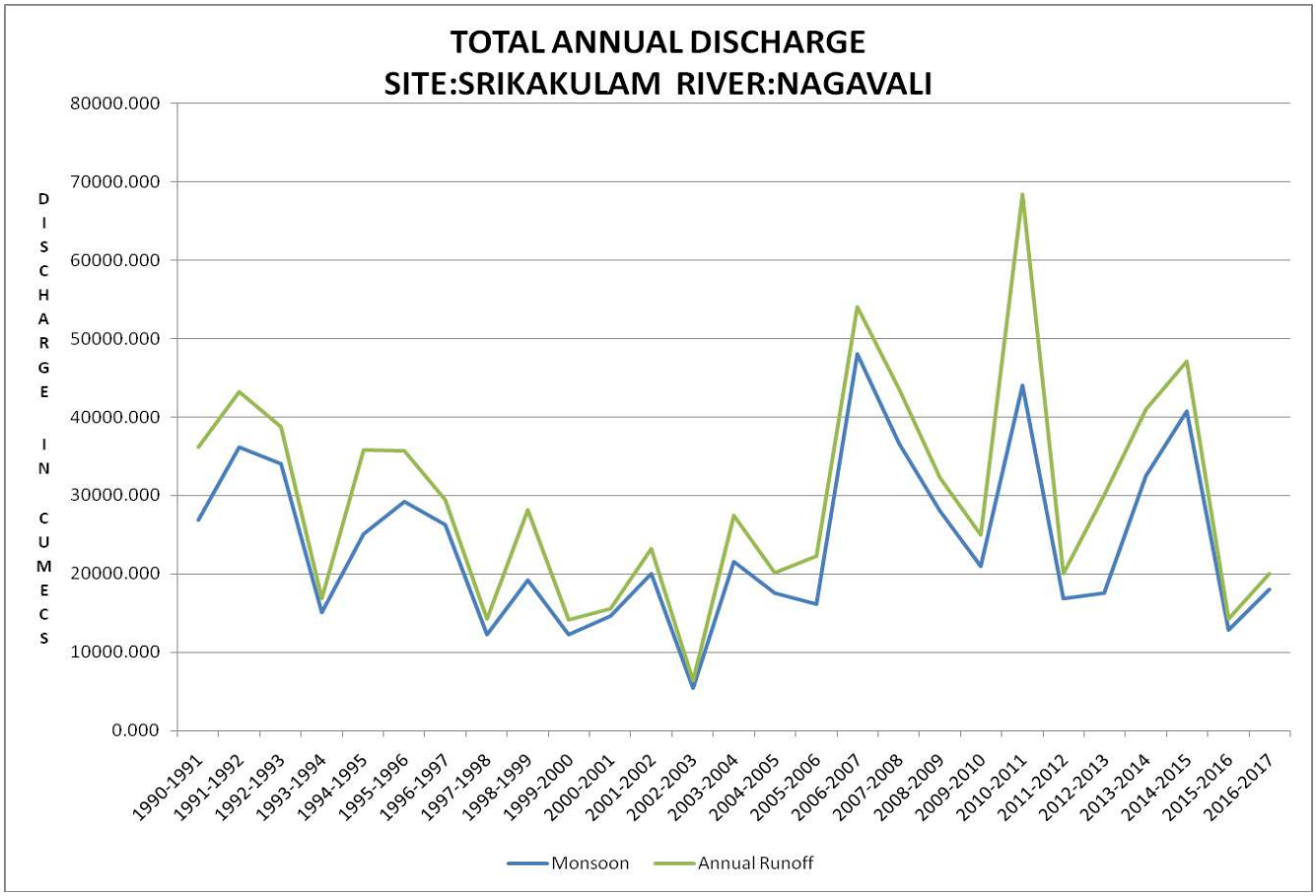
S.No	Parameters	Winter																	
		Nov - Feb																	
		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2003	2004	2005	2006	2007	2008
	PHYSICAL																		
1	Q (cumec)																		
2	EC_FLD (µmho/cm)			305		284	410	310	247	280	556	522	664	461	409				298
3	EC_GEN (µmho/cm)			295		280	410	310	247	280	556	475	666	460	400				290
4	pH_FLD (pH units)			7.8		7.8	7.7	8.3	7.7	8.0	7.4	7.9	7.4	7.8	7.8				8.2
5	pH_GEN (pH units)			7.8		7.7	7.7	8.3	7.7	8.0	7.4	7.9	7.5	7.8	7.8				8.2
6	Temp (deg C)			25.7		20.0	21.5	21.0	28.0		22.8	26.5	27.6	28.8	27.8				32.4
	CHEMICAL																		
1	Alk-Phen (mgCaCO3/L)			0.0		0.0	0.0	0.0	0.0		0.0	11.5	0.0						0.0
2	ALK-TOT (mgCaCO3/L)			111		99	147	134	111		117	95	72						105
3	B (mg/L)			0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00				0.00
4	Ca (mg/L)			31		30	34	42	28	21	39	22	49	45	47				32
5	Cl (mg/L)			24.1		21.4	24.3	26.4	23.8	21.2	23.6	17.9	10.4	41.0	20.2				28.0
6	CO3 (mg/L)			0.0		0.0	0.0	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0				0.0
7	F (mg/L)			0.31		0.11	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.90	0.00				0.06
8	Fe (mg/L)			0.1		0.1	0.1	0.0		0.1	0.6	0.4	2.3	0.2	0.1				0.1
9	HCO3 (mg/L)			134		121	172	163	136	101	143	87	87	199	198				128
10	K (mg/L)			12.2		2.0	2.3	2.6	3.3	1.4	2.4	1.2	14.3	3.8	2.8				2.0
11	Mg (mg/L)			7.7		7.3	17.0	25.3	14.9	3.5	2.9	12.6	23.3	10.7	12.1				8.9
12	Na (mg/L)			15.4		15.2	18.4	20.9	22.7	13.3	17.9	14.1	60.9	32.0	14.9				18.1
13	NO2+NO3 (mg N/L)			0.55		0.80	0.43	0.36		0.97	1.04	1.11	1.33	0.98	0.66				0.55
14	NO2-N (mgN/L)			0.00		0.00	0.00	0.07		0.00	0.01	0.01	0.02	0.00	0.00				0.00
15	NO3-N (mgN/L)			0.55		0.80	0.43	0.29		0.97	1.02	1.09	1.31	0.98	0.66				0.55
16	o-PO4-P (mg P/L)			0.010		0.020	0.083												0.010
17	P-Tot (mgP/L)			0.001		0.001	0.001	0.010	0.001	0.001	0.001	0.010	0.010	0.001	0.026				0.003
18	SiO2 (mg/L)			9.5		7.4	12.2	8.0	28.0	8.7	6.0	5.5	7.0	14.8	11.8				12.3
19	SO4 (mg/L)			9.6		6.8	9.3	4.7	9.9	18.5	5.7	5.0	1.3	8.9	4.3				9.4
	BIOLOGICAL/BACTERIOLOGICAL																		
	TRACE & TOXIC																		
	CHEMICAL INDICES																		
1	HAR_Ca (mgCaCO3/L)			78		74	84	104	71	51	98	56	122	113	118				80
2	HAR_Total (mgCaCO3/L)			122		104	155	209	133	66	110	109	219	158	169				117
3	Na% (%)			21		24	20	18	26	30	26	21	36	30	16				25
4	RSC (-)			0.1		0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.1	0.0				0.0
5	SAR (-)			0.6		0.6	0.6	0.6	0.9	0.7	0.7	0.6	1.8	1.1	0.5				0.7
	PESTICIDES																		

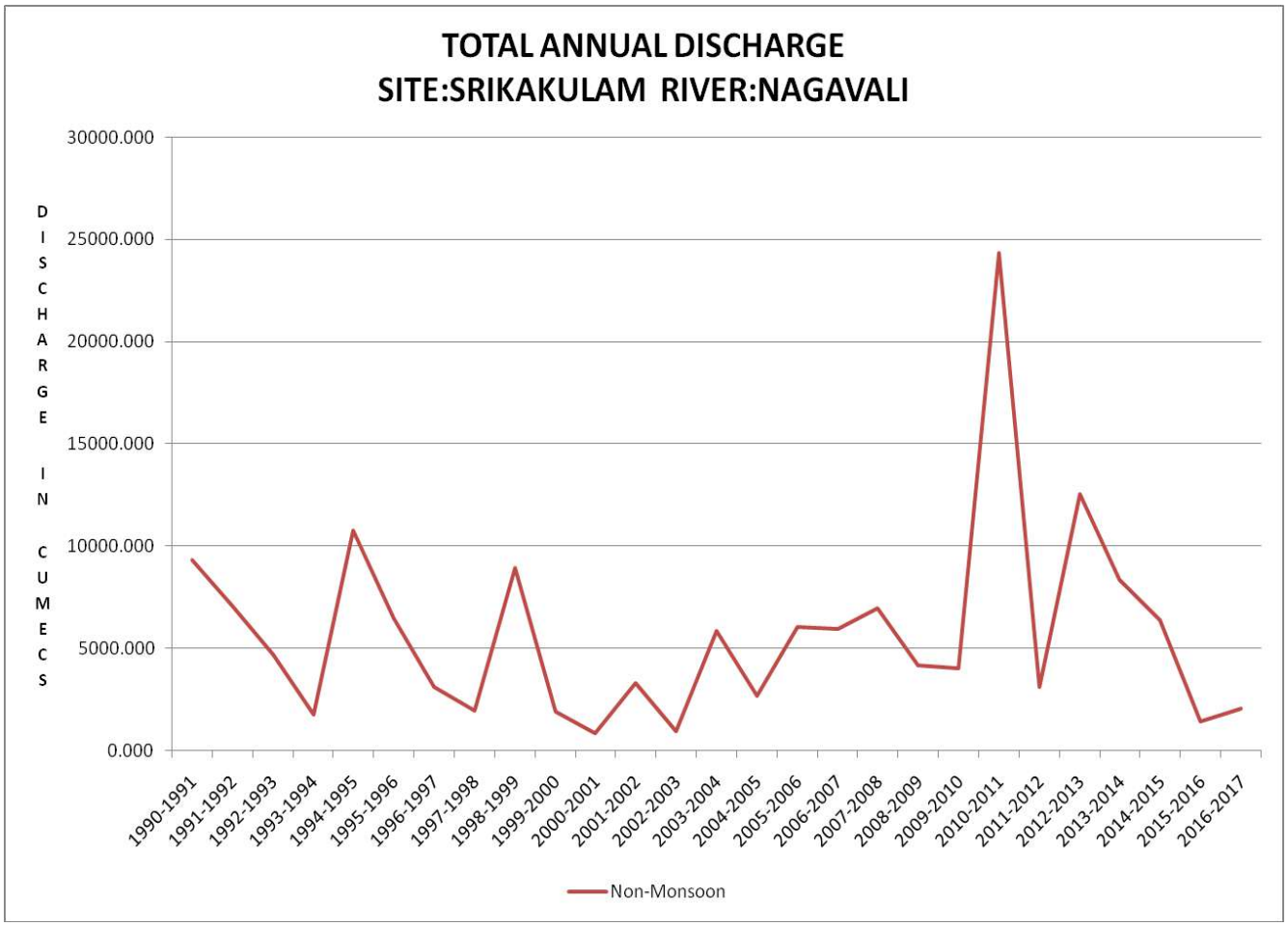
Water Quality Seasonal Average for the period: 2002-2017

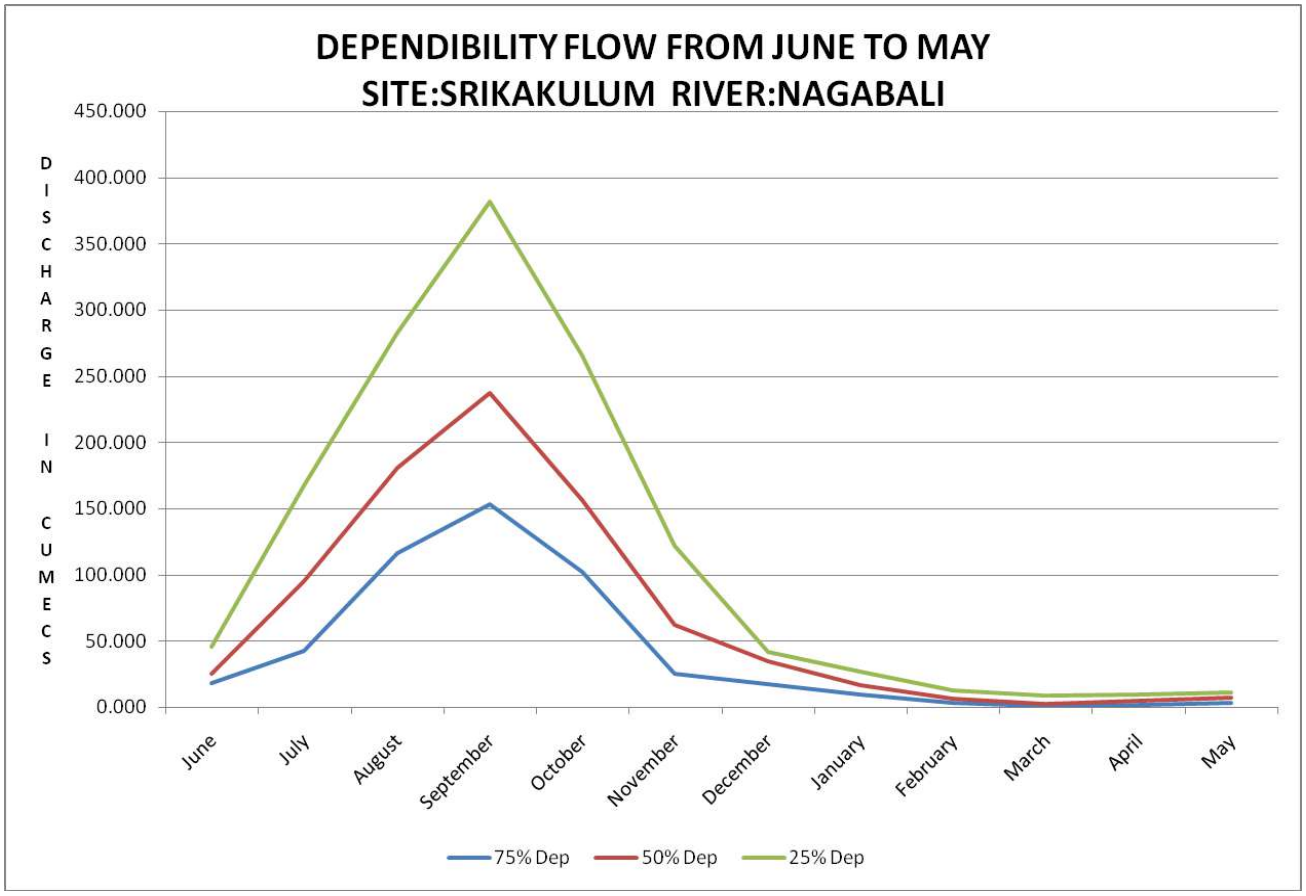
Station Name : SRIKAKULAM (AN000Y2) | **Division : E.E., Bhubaneswar**

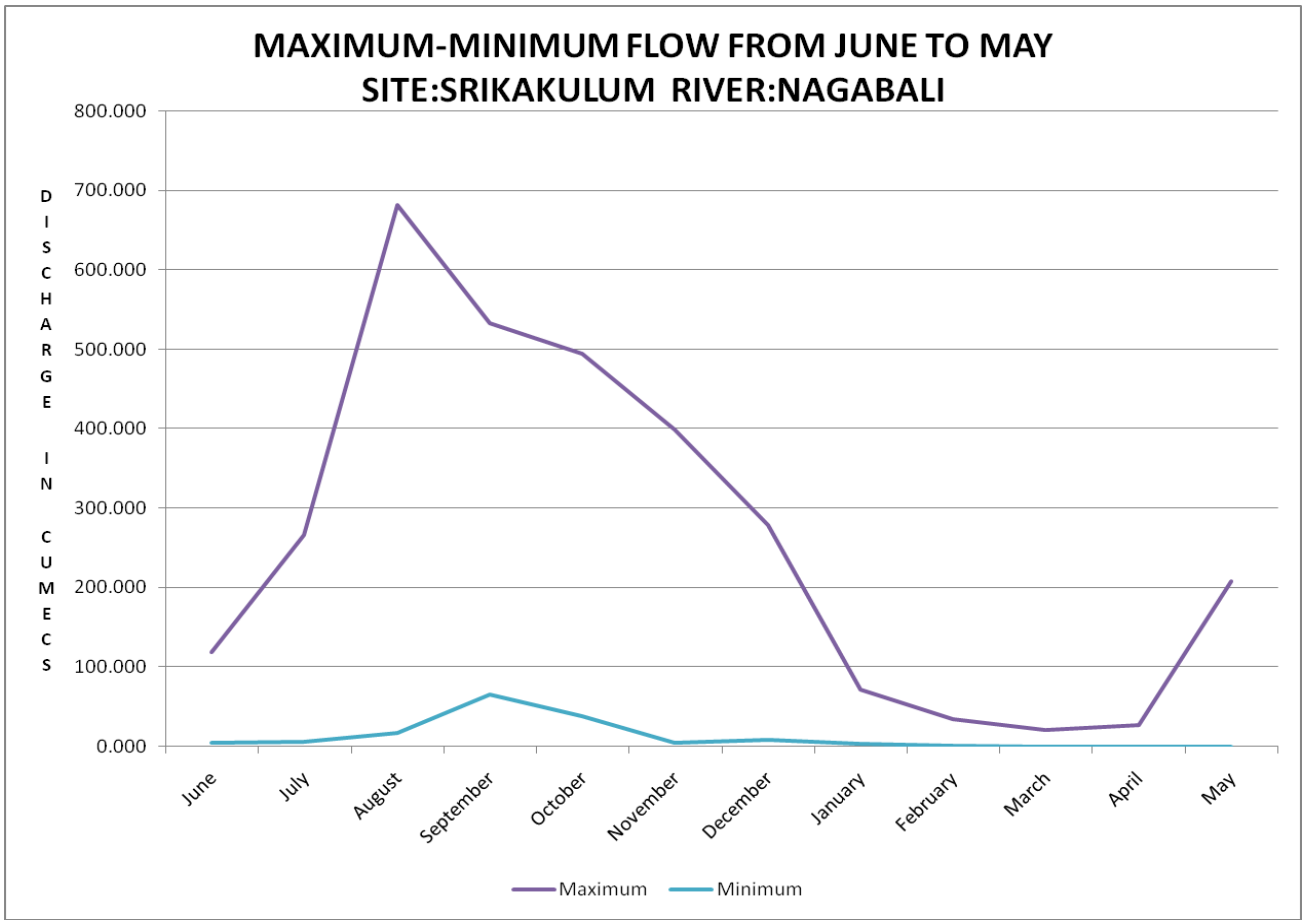
Local River : Nagavali | **River Water** | **Sub-Division : Behrampur**

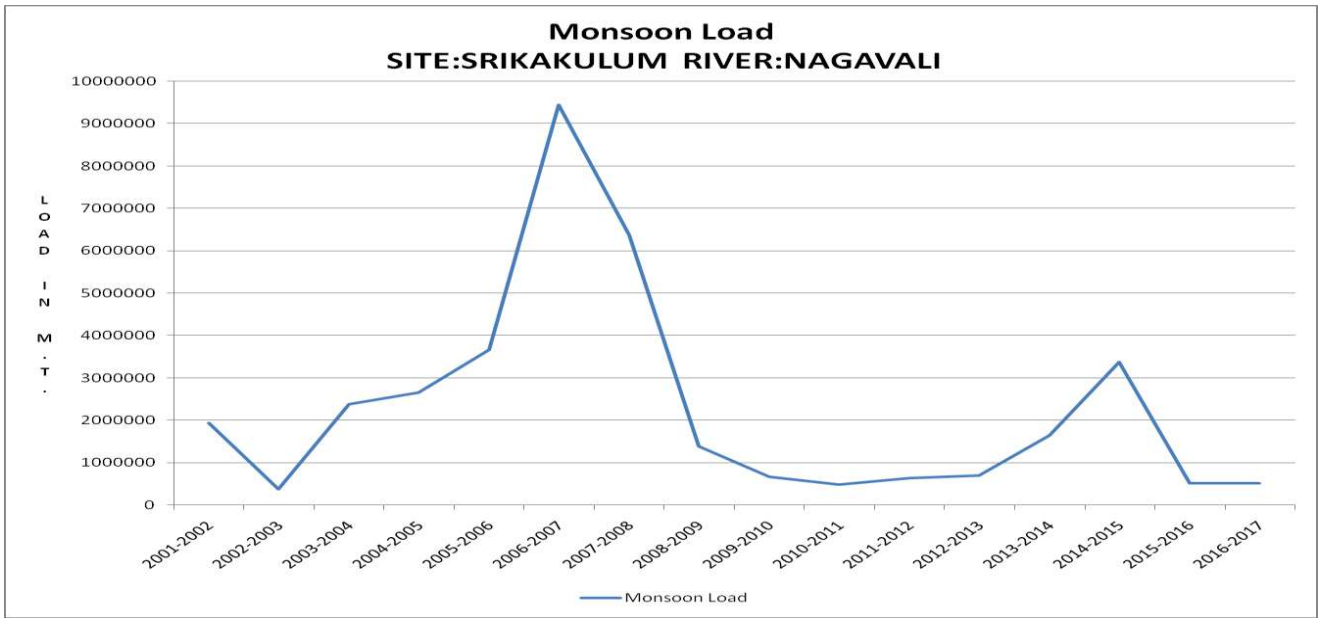
S.No	Parameters	Summer								
		Mar - May								
		2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL									
1	Q (cumec)									
2	EC_FLD (µmho/cm)		480	430	380	295	295	510	899	550
3	EC_GEN (µmho/cm)		280	430	380	295	295	510	908	551
4	pH_FLD (pH units)		8.4	8.0	8.0	7.4	7.9	8.1	7.8	8.1
5	pH_GEN (pH units)		8.4	8.0	8.0	7.4	7.9	8.1	7.8	8.2
6	Temp (deg C)		25.0	18.5		31.2	26.5	27.5	30.0	32.5
	CHEMICAL									
1	Alk-Phen (mgCaCO3/L)		0.5	0.0	0.0			0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)		170	171	157			120	74	79
3	B (mg/L)		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01
4	Ca (mg/L)		29	32	21	33	16	45	30	43
5	Cl (mg/L)		35.3	24.5	17.0	22.3	14.6	17.0	22.6	32.1
6	CO3 (mg/L)		0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	F (mg/L)		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
8	Fe (mg/L)		0.1	0.1	0.0	3.7	0.0	0.2	0.4	0.7
9	HCO3 (mg/L)		207	208	192	122	84	146	90	96
10	K (mg/L)		3.5	2.7		9.2	1.0	2.5	1.5	18.6
11	Mg (mg/L)		24.3	19.4	24.3	8.3	4.3	25.3	12.6	23.3
12	Na (mg/L)		25.3	16.1		21.5	12.4	19.4	5.0	44.8
13	NO2+NO3 (mg N/L)		0.85	0.62	0.36	14.29	0.48	0.71	1.05	1.26
14	NO2-N (mgN/L)		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.01
15	NO3-N (mgN/L)		0.85	0.62	0.29	14.29	0.48	0.71	1.05	1.25
16	o-PO4-P (mg P/L)		0.000							
17	P-Tot (mgP/L)		0.001	0.001	0.010	0.001	0.001	0.001	0.010	0.001
18	SiO2 (mg/L)		8.6	11.0	8.0	24.2	12.3	6.0	5.0	8.0
19	SO4 (mg/L)		9.1	7.3	7.0	12.3	16.2	8.0	5.7	1.6
	BIOLOGICAL/BACTERIOLOGICAL									
	TRACE & TOXIC									
	CHEMICAL INDICES									
1	HAR_Ca (mgCaCO3/L)		72	80	52	83	41	113	76	108
2	HAR_Total (mgCaCO3/L)		173	161	153	118	58	218	129	205
3	Na% (%)		24	18		27	31	16	8	30
4	RSC (-)		0.0	0.2	0.1	0.0	0.2	0.0	0.0	0.0
5	SAR (-)		0.8	0.6		0.9	0.7	0.6	0.2	1.4
	PESTICIDES									

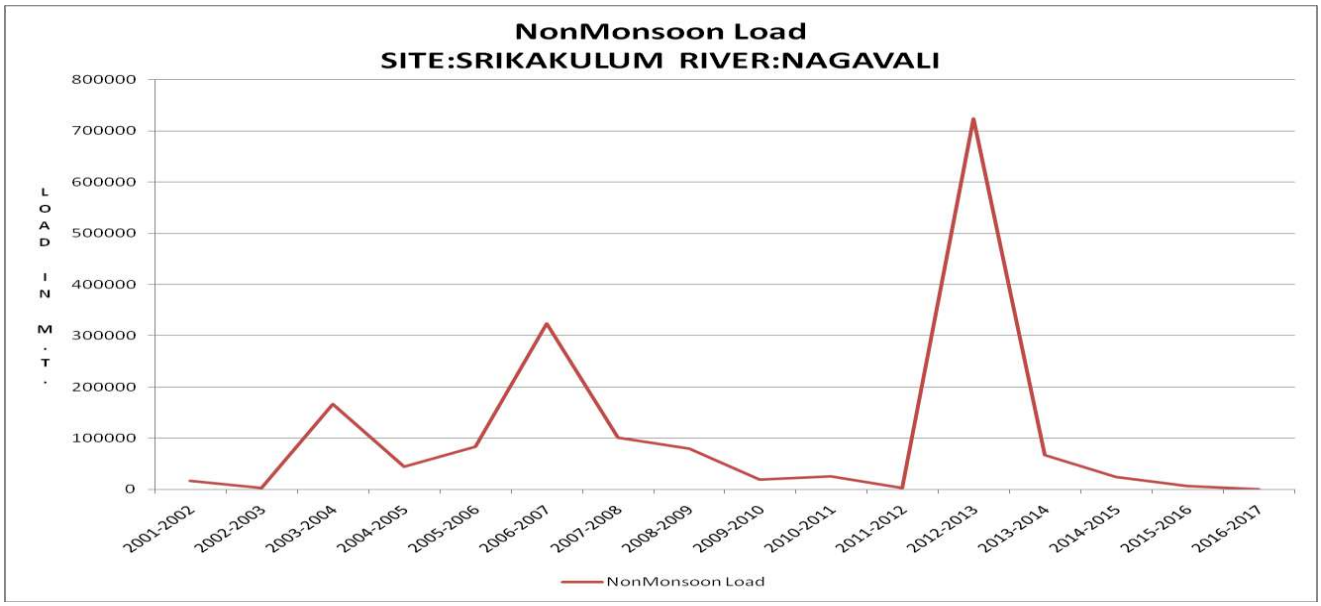

TOTAL ANNUAL DISCHARGE
SITE:SRIKAKULAM RIVER:NAGAVALI
DISCHARGE IN CUMECS
80000.000
70000.000
60000.000
50000.000
40000.000
30000.000
20000.000
10000.000
0.000
1990-1991
1991-1992
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon
Annual Runoff

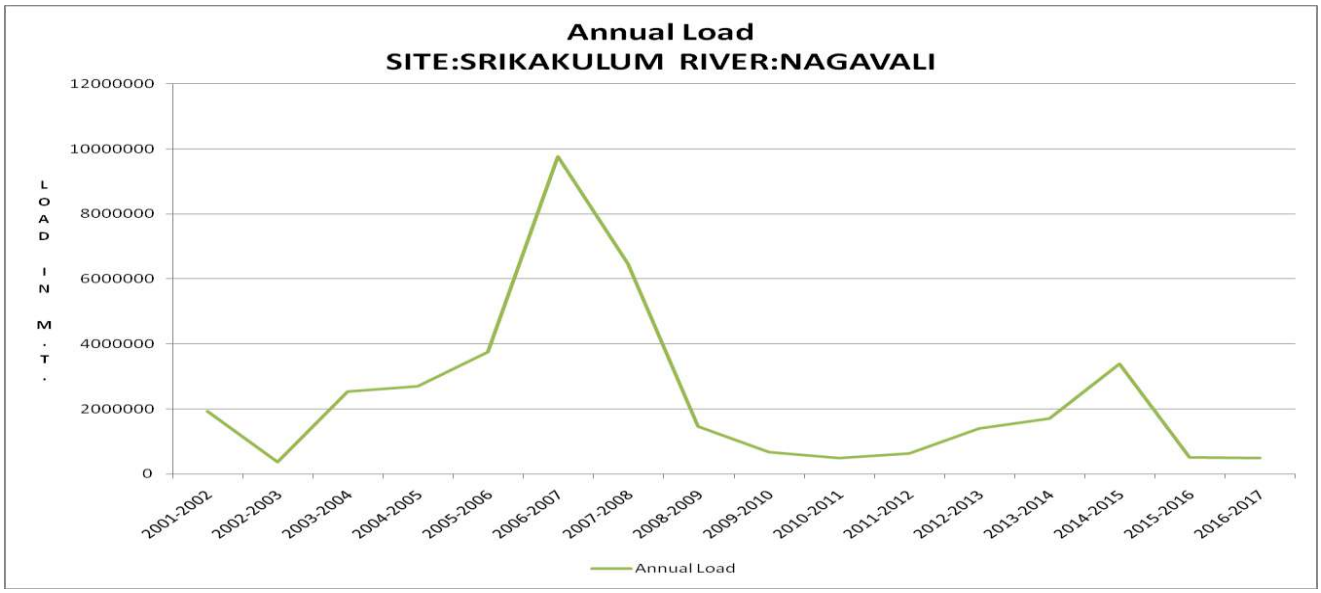

TOTAL ANNUAL DISCHARGE
SITE:SRIKAKULAM RIVER:NAGAVALI
DISCHARGE IN CUMECS
30000.000
25000.000
20000.000
15000.000
10000.000
5000.000
0.000
1990-1991
1991-1992
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Non-Monsoon

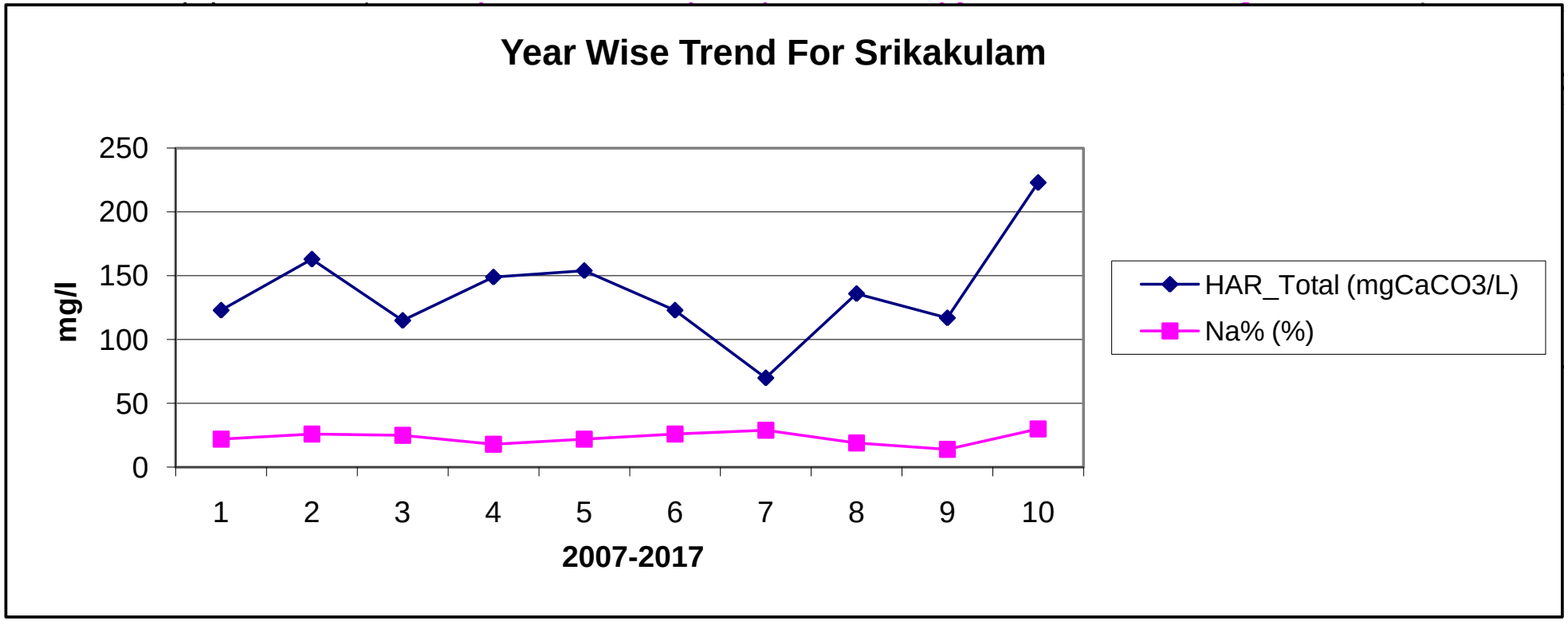

DEPENDIBILITY FLOW FROM JUNE TO MAY
SITE:SRIKAKULUM RIVER:NAGABALI
DISCHARGE IN CUMECS
450.000
400.000
350.000
300.000
250.000
200.000
150.000
100.000
50.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
75% Dep
50% Dep
25% Dep

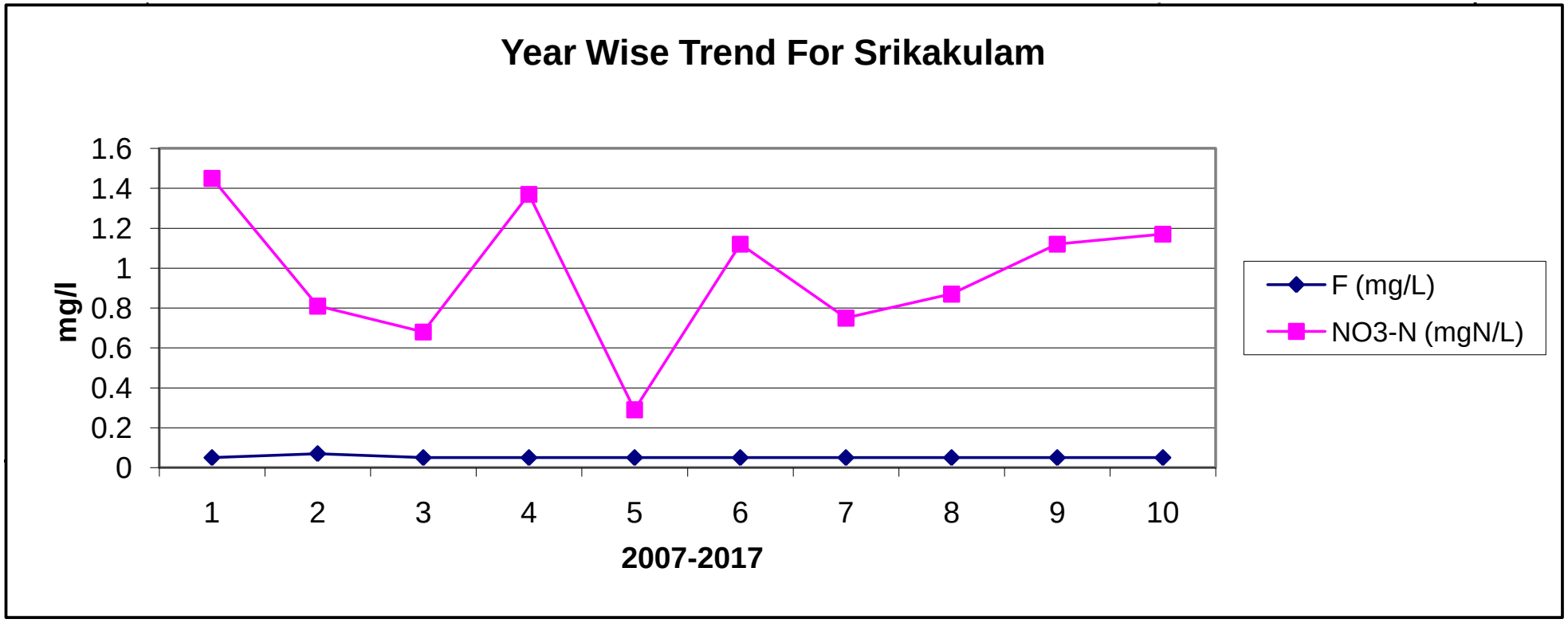

MAXIMUM-MINIMUM FLOW FROM JUNE TO MAY
SITE:SRIKAKULUM RIVER:NAGABALI
DISCHARGE IN CUMECS
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
Maximum
Minimum

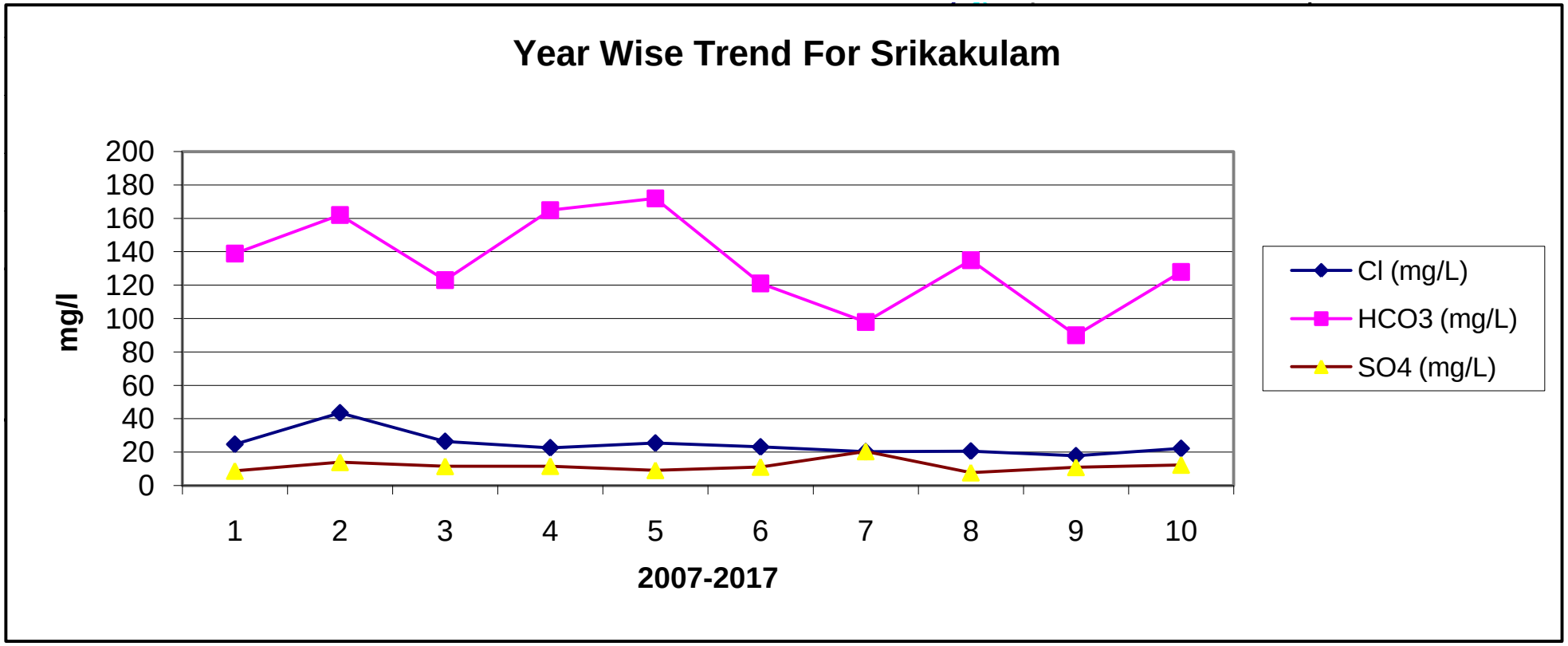

Monsoon Load
SITE:SRIKAKULUM RIVER:NAGAVALI
LOAD IN M.T.
10000000
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon Load

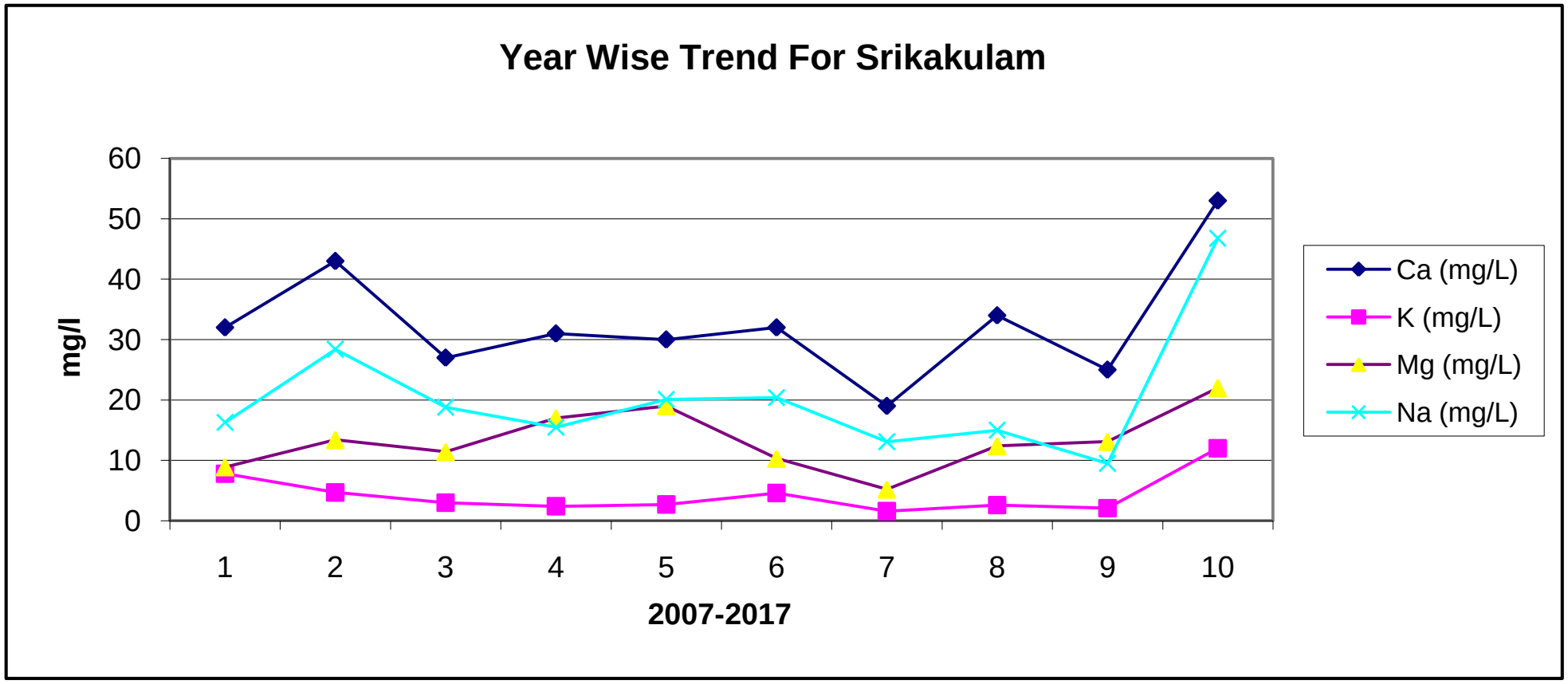

NonMonsoon Load
SITE:SRIKAKULUM RIVER:NAGAVALI
LOAD IN M.T.
800000
700000
600000
500000
400000
300000
200000
100000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
NonMonsoon Load


Annual Load
SITE:SRIKAKULUM RIVER:NAGAVALI
LOAD IN M.T.
12000000
10000000
8000000
6000000
4000000
2000000
0
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Annual Load


Year Wise Trend For Srikakulam
250
200
150
100
50
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
HAR_Total (mgCaCO3/L)
Na% (%)


Year Wise Trend For Srikakulam
mg/l
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
9
10
2007-2017
F (mg/L)
NO3-N (mgN/L)


Year Wise Trend For Srikakulam
mg/l
200
180
160
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
2007-2017
Cl (mg/L)
HCO3 (mg/L)
SO4 (mg/L)


Year Wise Trend For Srikakulam
60
50
40
30
20
10
0
mg/l
1
2
3
4
5
6
7
8
9
10
2007-2017
Ca (mg/L)
K (mg/L)
Mg (mg/L)
Na (mg/L)

SARADA BASIN

SARADA BASIN

1 GENERAL

1.1 Introduction

River Sarada, an east flowing medium sized river, lies in the district of Visakhapatnam of Andhra Pradesh. The geographical co-ordinates of the river are North latitude 17 °25′ to 18°17′ and East longitude 82°32′ to 83°06′. The basin is surrounded by Nagavali in the North, Gostari, Gambi Ramgedda, Megadnigedda in the East, Bay of Bengal in the South and Machhkund sub- basin of the Godavari in the West. The catchment area of the basin is 2665 sq. km. It rises at an elevation of 1000 m near Longuparu village and runs a distance of 122 km before out-falling in the Bay of Bengal.

Basin Map of Sarada river system showing the various hydrological and hydrometeorological observation stations maintained by CWC, State Government and the India Meteorological Department is enclosed herewith.

1.2 River system

Details of the important tributaries of the river Sarada is tabulated below:

Name of River	River/Tributary	Length (km)	Catchment area (sq.km)	Percentage of total catchment area
Sarada	Mainstream	122	1,577	59.2
Bodderu	Left Tributary	19	125	4.7
Pedderu	Right Tributary	54	963	36.1
		Total	2,665	100.0

1.3 Climatic Characteristics

This basin is generally influenced by south west monsoon. The average annual rainfall of the basin is around 1000 mm. The maximum temperature in the basin rises up to 42.5°C during May and goes down to 18ºC in December-January.

1.4 Geology

Deposits of the basin are alluvium, beach sands and laterite soils. Bed soil of clay, sand, gravel and boulders stretch all along the coast except near to Visakhapatnam city. Important minerals found in the basin are Manganese, Quartz, Graphite, Mica, Bauxite, Aluminium and Fire Clay.

1.5 Site Details

Sl.No.	Name of Project	River	Status
1.	Raiwada	Sarada	Existing
2.	Konam	Bodderu (Tributary)	Ongoing
3.	Pedderu	Pedderu (Tributary)	Ongoing

2. STREAM FLOW DATA

2.1 Methodology

Area-velocity method is generally adopted for measuring discharge at sites. Cup type current meter is used to measure the velocity of the flow and the depth is measured by

using sounding rod for depths upto 3 m and by log line beyond 3 m. Discharge by area velocity method is being observed once in a day starting at 0800 Hrs. at all the sites except on Sundays and holidays. Besides, silt and water quality observation are also being carried out at sites of CWC, as listed above.

The observed stage and discharge figures for each season (monsoon and non-monsoon) are plotted and a mean Stage V/s. Discharge curve is drawn, giving due attention to the scattered points with reference to area, velocity etc.

The factors responsible for the shifting of the curves are also taken care of by studying the river cross section at regular intervals and with super imposition of previous years' Stage V/s. Discharge curves. Accordingly, the trend of the current curve is finalised. Finally, the discharges of the non observed days are computed from these Stage V/s. Discharge Curves..

2.2 Data Availability

Code No.	Station Name	Type	Data available	
			From	To
AS000S3	Anakapalli	G & D	G-01.12.87 D-06.08.89	Continuing -do-

2.3 Explanatory Notes on Water Year Book

SWDES (Surface Water Data Entry Software), a custom made software for processing hydrological data, has been used for preparation of this volume. The explanatory notes described below can be used for interpretation of data presented in this volume.

i) Water Year ranges from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

ii) Discharge is given in cubic meters per second.

iii) Discharges are expressed as 0.000 when river bed is dry and 0.000 N.F. when velocity is observed as 'NIL'.

iv) The zero R.L. of gauge is a datum level fixed for given site, which is kept 1 or 2 m lower than the lowest water level recorded in a perennial stream. In a non-perennial stream, it is kept 1 or 2 m lower than the lowest bed level of the stream.

v) Discharges are rounded off as per standard practice.

vi) Runoff in mm is the notional depth of water in millimeters over the catchment, equivalent to annual runoff volume calculated at the discharge measurement station. It is computed using the relation:

$$\text{Runoff (mm)} = \frac{\text{Annual runoff } (Mm^3) \times 1000}{\text{Catchment area } (km^2)}$$

vii) Peak and lowest flow correspond to the highest and lowest water levels recorded from 'SWDES' entered data.

viii) Measuring Authority refers to the field division of Central Water Commission (Eastern Rivers Division) responsible for the operation of the gauging station.

ix) The gauging station code number is a unique seven column alphanumeric reference number which facilitates storage and retrieval of flow data in data base. The first column is identifier of either an integral river basin or, for the sake of convenience, a region having several contiguous river catchments. This is followed by a column which identifies an independent river system which either has one or more outlets to the sea or crosses international border to enter another country. The third, fourth and fifth column spaces denote first, second and third order tributaries, respectively, from the mouth upstream. The sixth and seventh column spaces indicate the location of the gauging station in one of the 225 slots earmarked on the river. The blank column spaces are filled by zero.

3. HYDROLOGICAL DATA

This volume contains the following information for each site stated above:

i. History Sheet: Site Name, State, District, River Basin, Tributary, Sub-Tributary, Catchment Area, Latitude / Longitude, Opening / Closing date for various types of data.
ii. Annual maximum/minimum discharge since period of observation.
iii. Daily Water level and observed/ computed discharge data including 10-daily, monthly and annual totals etc.
iv. Histogram and Hydrograph showing current year monthly mean discharges, Historical monthly mean discharges, historical monthly minimum and monthly maximum discharges.
v. Histogram showing Annual Run off volume since beginning of observation
vi. Pie-Chart showing monthly mean run off (as percentage of Annual Run off) historical for the current year.
vii. Plot of Pre and Post Monsoon Cross-section of the rivers for current year.
viii. Water Level hydrograph for 3(three) major flood events of current year.

4. SEDIMENT DATA (In case of Sediment Observation sites)

The frequency of sediment observation is carried out daily during monsoon season and once in a week (on Monday) during the non-monsoon period. Data for non-observed days is estimated/ interpolated from the relationship of discharge v/s. sediment load, prepared on the basis of observed sediment concentration and weighted mean discharge of the same year.

Sediment samples are collected from 0.6 depth, using Punjab type bottle sampler, from all the verticals along the hydrological observation sections where velocity is observed for computation of discharge. The collected samples from all the segments are combined in 3 to 7 groups having compartments or groups of equal or nearly equal discharges for analysis. Quantum of suspended sediment load is estimated in three grades, viz. Coarse, Medium and Fine. Coarse and medium grades are separated by sieving process and the fine grade by filtration of left over samples after sieving through filter paper. Grade wise concentration is derived gravimetrically as per standard procedure. The following parameters are derived and recorded:

- Daily Observed suspended sediment (g/l).
- Corresponding discharge.
- Average sediment load in tonnes/day (10 daily & monthly basis).
- Annual sediment load for the current year.
- Annual & Seasonal sediment load and the corresponding volume of inflow for all the years since inception.
- Grain size distribution of bed load.

3. WATER QUALITY DATA (In case of Water Quality Observation sites)

The water samples are collected at a regular interval of once in a month for trend stations and once in two month for base station (on 1st working day), from the main flowing segment of the stream just below the water surface (20 to 30 cm) on the Station Gauge line where depth of flow and velocity are maximum, preferably in the mid stream. The water samples are collected in the pre-rinsed and cleaned one-litre capacity polythene bottle having double stopper (inside and outside) facility. Sampling bottle is filled to its full capacity without entrapping air bubbles inside.

After sampling, the collected samples are sent to the Water Quality Laboratory (Level-II) based at Bhubaneswar (under the Eastern Rivers Division) and to Raipur laboratory (under Mahanadi Division, Burla), along with in-situ physical characteristics, for analysis. The samples received from the sites are preserved in a refrigerator in the water quality laboratories for analysis**.**

Analysis of parameters, namely pH, Electrical conductivity, Sodium, Potassium, Iron, Aluminum, Ammonia, Fluoride, Nitrate, Nitrite, Phosphate, Silicate, Boron, Sulphate, Calcium, Magnesium, Carbonate, Bi-carbonate, Chloride, Dissolved Oxygen, BOD and COD, are carried out at the Level II laboratory by using standard methodology. Micro biological parameters like total colliform and faecal colliform are also being analyzed. For analysis of trace and toxic elements, samples are sent to Level-II+ laboratory at Hyderabad once in a year, in the month of April.

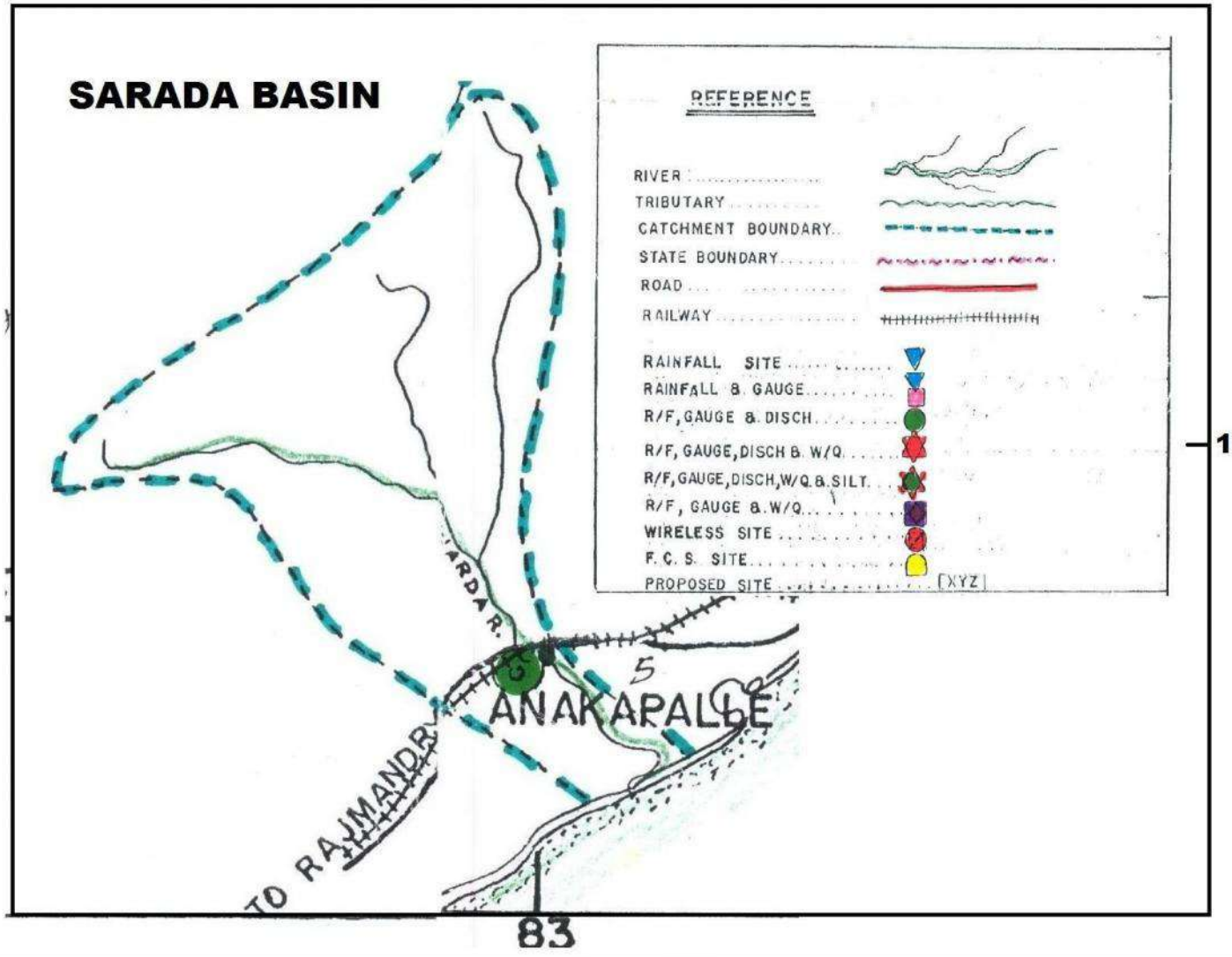
The following parameters are analyzed and recorded:

- Monthly Values: Physical; Chemical (mg/l); Biological (mg/l); Traces & Toxic (mg/l) and Chemical Indices.

- Average Values for the Year: 10 Years data to be given season wise averages:-
  - Average for Summer (March to June).
  - Average for Floods (July to October).
  - Average for Winter (November to February)
  -

NAME OF THE SITE IN OPERATION UNDER SARADA BASIN

Sl. No.	Station Name	River/ Tributary	Code No.	Type	Latitude	Longitude
1.	Anakapalli	Sarada	AS000S3	G & D	17°-.41-'00"	85°-35-'00"


SARADA BASIN
REFERENCE
RIVER
TRIBUTARY
CATCHMENT BOUNDARY
STATE BOUNDARY
ROAD
RAILWAY
RAINFALL SITE
RAINFALL & GAUGE
R/F, GAUGE & DISCH
R/F, GAUGE, DISCH & W/Q
R/F, GAUGE, DISCH, W/Q & SILT
R/F, GAUGE & W/Q
WIRELESS SITE
F.C.S. SITE
PROPOSED SITE [XYZ]
ANAKAPALLE
TO RAJAMANDRY
83

18

142

HISTORY SHEET

Water Year : 2016-2017

Site	**:**	**ANAKAPALLI**	**Code**	**:**	**AS000S3**
State	:	Andhra Pradesh	District		Visakhapatnam
Basin	:	EFR B Mahanadi-Godavari	Independent River	:	Sarada
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Sarada
Division	:	E.E., Bhubaneswar	Sub-Division	:	Behrampur
Drainage Area	:	2090 Sq. Km.	Bank	:	Left
Latitude	:	17°41'00"	Longitude	:	83°01'08"
Zero of Gauge (m)	:	20.4 (m.s.l)	1/1/1987	-	1/12/2090
		Opening Date	Closing Date		
Gauge	:	12/1/1987			
Discharge	:	8/16/1989			
Sediment	:				
Water Quality	:				

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1991-1992	114.2	22.800	10/12/1991	0.000	20.770	5/23/1992
1992-1993	499.7	24.250	10/10/1992	0.000	20.785	5/21/1993
1993-1994	64.72	22.378	10/22/1993	0.000	20.400	4/7/1994
1994-1995	250.5	23.500	5/11/1995	0.000	20.400	4/3/1995
1995-1996	571.1	23.975	10/11/1995	0.000	20.590	4/24/1996
1996-1997	897.0	25.100	10/3/1996	0.000	20.610	3/24/1997
1997-1998	130.8	22.590	9/25/1997	0.000	20.490	5/17/1998
1998-1999	887.0	25.200	11/16/1998	0.000	20.560	5/5/1999
1999-2000	96.34	22.340	10/11/1999	0.000	20.330	4/17/2000
2000-2001	157.8	22.600	8/26/2000	0.000	20.010	3/21/2001
2001-2002	93.94	22.555	10/8/2001	0.000	19.780	4/28/2002
2002-2003	24.95	22.060	10/16/2002	0.000	19.600	2/26/2003
2003-2004	280.5	23.600	10/25/2003	0.000	20.520	4/21/2004
2004-2005	153.2	23.690	6/14/2004	0.000	20.560	4/13/2005
2005-2006	572.7	23.950	10/15/2005	0.000	20.400	8/2/2005
2006-2007	374.2	23.540	8/4/2006	0.000	20.520	5/10/2007
2007-2008	542.1	24.050	10/6/2007	0.000	21.400	3/7/2008
2008-2009	179.2	22.920	9/12/2008	1.125	20.680	3/6/2009
2009-2010	140.9	22.550	10/3/2009	0.000	20.710	1/26/2010
2010-2011	590.0	23.720	12/9/2010	0.000	20.680	5/7/2011
2011-2012	308.9	22.800	9/3/2011	0.000	20.410	5/19/2012
2012-2013	3981	27.480	11/4/2012	1.070	20.690	4/18/2013
2013-2014	850.5	24.430	10/27/2013	0.000	20.850	4/5/2014
2014-2015	767.9	24.550	10/13/2014	0.000	20.790	7/21/2014
2015-2016	366.3	23.315	9/20/2015	0.000	20.710	4/13/2016
2016-2017	487.4	23.450	9/26/2016	0.000	20.600	4/27/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

Local River : Sarada **Sub-Division : Behrampur**

Day	Jun		Jul		Aug		Sep		Oct		Nov	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1			21.590	12.41	21.720	21.22	21.860	50.22	22.760	275.0	21.610	21.97
2	20.930		21.670	15.41	21.650	15.63	22.145	97.04	22.500	206.0 *	21.610	21.79
3	21.000		21.750	19.70 *	21.730	28.17	22.010	75.81	22.490	204.0	21.610	21.30
4	20.950		21.740	19.20	21.730	27.77	21.940	63.30 *	22.220	133.9	21.600	19.06
5	20.960		21.750	19.67	21.890	49.47	21.850	47.95	22.250	146.2	21.600	18.85
6	20.950		21.820	23.11	21.770	33.79	21.790	40.93	22.520	212.4	21.600	18.25 *
7	20.920		21.740	19.00 *	21.700	24.10 *	21.730	35.26	22.710	251.2	21.590	17.62
8	20.880		21.710	17.53	21.625	15.41	21.670	30.30	22.750	263.8	21.580	16.70
9	20.840		21.620	13.64	21.520	10.57	21.610	26.55	22.500	205.0 *	21.580	16.63
10	20.880		21.700	17.00 *	21.550	11.74	21.590	23.98	22.290	140.0 *	21.570	15.26
11	21.040		21.600	13.37	21.470	8.674	21.170	22.60 *	22.130	95.00 *	21.560	13.80
12	21.020		21.550	11.25	21.450	7.888	21.600	24.40 *	22.030	80.00 *	21.560	13.72
13	20.980		21.500	9.259	21.420	6.032	22.450	171.2	21.990	74.49	21.560	13.58 *
14	20.920		21.440	6.837	21.400	5.205 *	22.440	179.5	21.870	56.86	21.550	11.57
15	20.890		21.350	3.682	21.390	4.680 *	22.620	224.1	21.790	44.57	21.550	11.56
16	20.860		21.310	3.130	21.280	4.232	22.315	132.2	21.680	34.50 *	21.540	9.920
17	21.100		21.270	2.360 *	21.410	5.795	22.340	131.8	21.660	30.13	21.560	12.20
18	21.090		21.210	1.833	21.430	6.205	22.410	162.0 *	21.660	29.92	21.560	12.02
19	21.090		21.190	1.531	21.410	5.693	22.350	147.4	21.650	29.09	21.550	10.80
20	21.080		21.170	1.244	21.400	5.486	22.450	189.8	21.640	28.57	21.550	10.50 *
21	21.080		21.150	1.248	21.290	3.980 *	22.580	197.7	21.680	32.12	21.540	10.15
22	21.070		21.140	1.138	21.190	2.631	22.820	280.4	21.660	30.44	21.540	10.08
23	21.100		21.800	22.58	21.180	2.509	23.170	423.1	21.650	29.60 *	21.540	10.00
24	21.120		22.040	84.58 *	21.150	1.385	23.410	463.2	21.630	25.69	21.530	9.287
25	21.110		21.865	40.62	21.180	2.513	23.350	429.0 *	21.620	24.38	21.530	9.170
26	21.130		21.740	19.38	21.170	2.475	23.450	487.4	21.600	19.68	21.520	8.500
27	21.430	5.047	21.720	18.52	21.900	56.59	23.265	421.0	21.600	19.66	21.520	8.400 *
28	21.590	12.77	21.730	19.11	21.820	44.50 *	22.790		21.630	25.32	21.510	8.010
29	21.610	13.87	21.660	14.35	21.780	39.75	22.560	116.9	21.620	23.81	21.510	7.952
30	21.570	12.33	21.640	13.83	21.700	30.90	22.150	109.4	21.640	28.80 *	21.500	7.566 *
31			21.700	18.50 *	22.020	76.83			21.620	23.27		
Ten-Daily Mean												
I Ten-Daily	20.923		21.709	17.67	21.689	23.79	21.819	49.13	22.499	203.8	21.595	18.74
II Ten-Daily	21.007		21.359	5.450	21.406	5.989	22.215	138.5	21.810	50.31	21.554	11.97
III Ten-Daily	21.281	11.00	21.653	23.08	21.489	24.01	22.954	325.3	21.632	25.71	21.524	8.912
Monthly												
Min.	20.840	5.047	21.140	1.138	21.150	1.385	21.170	22.60	21.600	19.66	21.500	7.566
Max.	21.610	13.87	22.040	84.58	22.020	76.83	23.450	487.4	22.760	275.0	21.610	21.97
Mean	21.076	11	21.576	15.65	21.527	18.12	22.330	165.7	21.969	91.08	21.558	13.21

Annual Runoff in MCM = 825 Annual Runoff in mm = 395

Peak Observed Discharge = 487.4 cumecs on 26/09/2016 Corres. Water Level :23.45 m

Lowest Observed Discharge = 0.000 cumecs on 23/01/2017 Corres. Water Level :21.11 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

Local River : Sarada **Sub-Division : Behrampur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	21.610	21.99	21.190	1.400 *	21.080	0.680			20.760	0.000	20.580	0.000
2	21.610	21.79	21.190	1.373	21.080	0.680			20.760	0.000 *	20.580	0.000
3	21.610	21.31	21.180	1.181	21.070	0.670			20.760	0.000	20.570	0.000
4	21.600	19.05	21.180	1.192	21.070	0.670			20.750	0.000	20.570	0.000
5	21.600	18.85	21.170	0.955	21.070	0.670 *			20.750	0.000	20.570	0.000
6	21.600	18.25 *	21.160	0.944	21.070	0.670			20.740	0.000	20.570	0.000
7	21.590	17.62	21.160	0.929	21.060	0.660			20.740	0.000	20.560	0.000 *
8	21.580	16.70	21.160	0.821 *	21.060	0.660			20.730	0.000	20.560	0.000
9	21.580	16.63	21.150	0.767	21.060	0.660			20.730	0.000 *	20.560	0.000
10	21.570	15.26	21.150	0.759	21.060	0.660			20.720	0.000	20.550	0.000 *
11	21.560	13.80	21.150	0.537	21.050	0.650			20.720	0.000	20.550	0.000
12	21.560	13.58 *	21.140	0.714	21.050	0.650 *			20.720	0.000	20.550	0.000
13	21.560	13.58 *	21.140	0.710	21.050	0.650			20.710	0.000	20.550	0.000
14	21.550	11.59	21.140	0.693	21.040	0.640			20.710	0.000 *	20.540	0.000 *
15	21.550	11.57	21.130	0.651 *	21.040	0.640			20.700	0.000	20.540	0.000
16	21.540	9.935	21.130	0.674	21.030	0.630			20.700	0.000 *	20.540	0.000
17	21.560	12.21	21.120	0.549	21.030	0.630			20.690	0.000	20.530	0.000
18	21.560	12.01	21.120	0.540	21.030	0.630			20.660	0.000	20.530	0.000
19	21.550	10.77	21.120	0.528	21.020	0.620 *			20.650	0.000	20.520	0.000
20	21.550	10.50 *	21.120	0.517	21.020	0.620			20.630	0.000	20.520	0.000
21	21.540	10.14	21.120	0.497	21.020	0.620			20.620	0.000	20.520	0.000 *
22	21.540	10.08	21.110	0.000 *	21.010	0.610			20.620	0.000	20.510	0.000
23	21.540	9.994	21.110	0.000	21.010	0.610			20.610	0.000 *	20.510	0.000
24	21.530	9.298			21.010	0.610			20.610	0.000	20.510	0.000
25	21.530	9.168			21.000	0.600			20.600	0.000	20.510	0.000
26	21.520	8.413			21.000	0.600 *			20.600	0.000	20.500	0.000
27	21.520	8.400 *			20.990	0.590			20.600	0.000	20.500	0.000
28	21.510	8.001			20.990	0.590			20.590	0.000	20.540	0.000 *
29	21.510	7.940							20.590	0.000	20.540	0.000
30	21.500	7.521							20.580	0.000 *	20.580	0.000
31											20.560	0.000
Ten-Daily Mean												
I Ten-Daily	21.595	18.74	21.169	1.032	21.068	0.668			20.744	0.000	20.567	0.000
II Ten-Daily	21.554	11.95	21.131	0.611	21.036	0.636			20.689	0.000	20.537	0.000
III Ten-Daily	21.524	8.896	21.113	0.166	21.004	0.604			20.602	0.000	20.525	0.000
Monthly												
Min.	21.500	7.521	21.110	0.000	20.990	0.590			20.580	0.000	20.500	0.000
Max.	21.610	21.99	21.190	1.400	21.080	0.680			20.760	0.000	20.580	0.000
Mean	21.558	13.2	21.145	0.736	21.038	0.638			20.678	0	20.543	0

Peak Computed Discharge = 429.0 cumecs on 25/09/2016 Corres. Water Level :23.35 m

Lowest Computed Discharge = 0.000 cumecs on 22/01/2017 Corres. Water Level :21.11 m

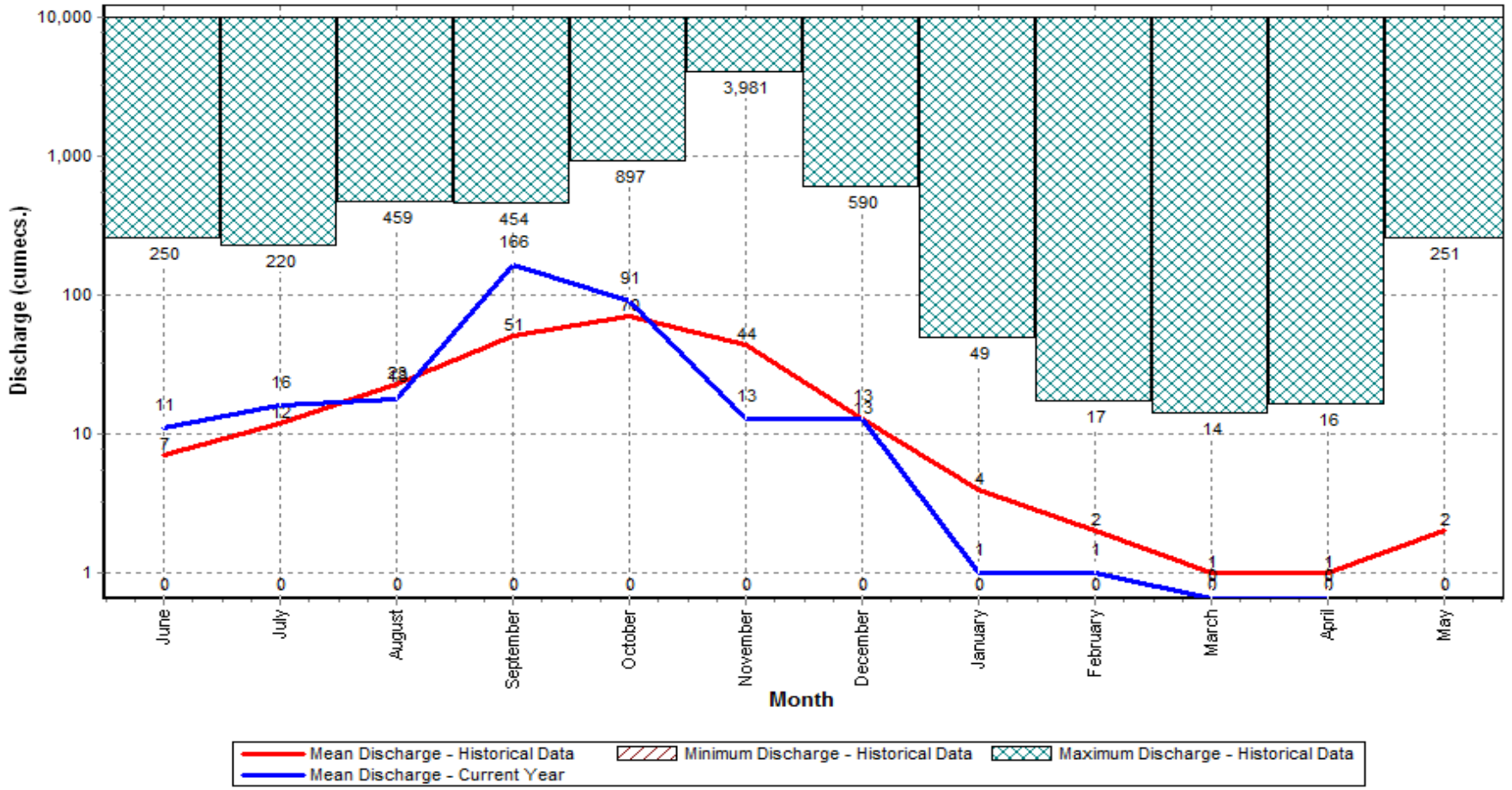
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

HISTOGRAM - HYDROGRAPH for Water Year : 2016-2017

Station Name : ANAKAPALLI (AS000S3) | **Data considered : 1991-2017** | **Division : E.E., Bhubaneswar**

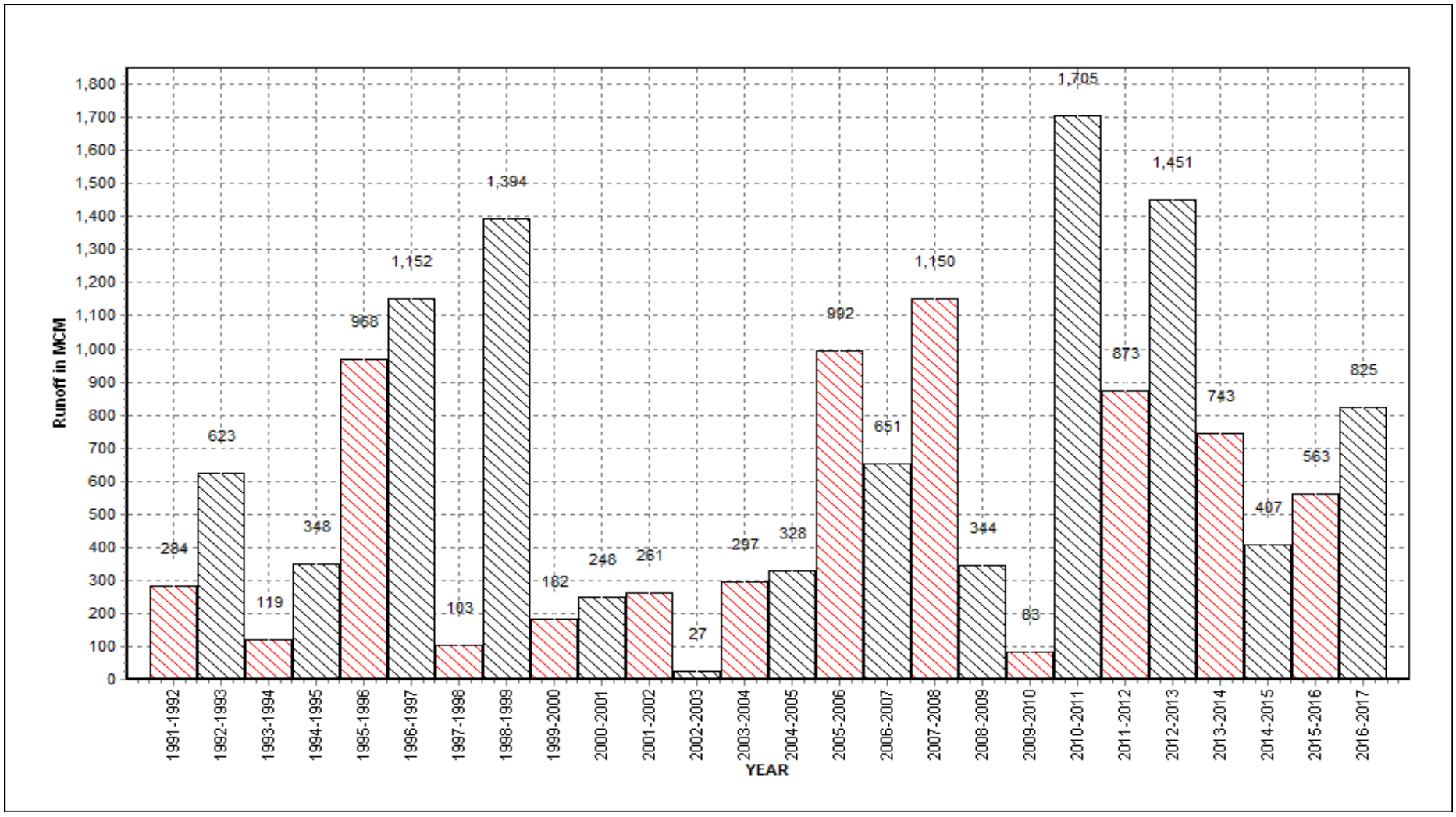
Local River : Sarada | **Sub-Division : Behrampur**



Annual Runoff Values for the period: 1991 - 2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

Local River : Sarada **Sub-Division : Behrampur**

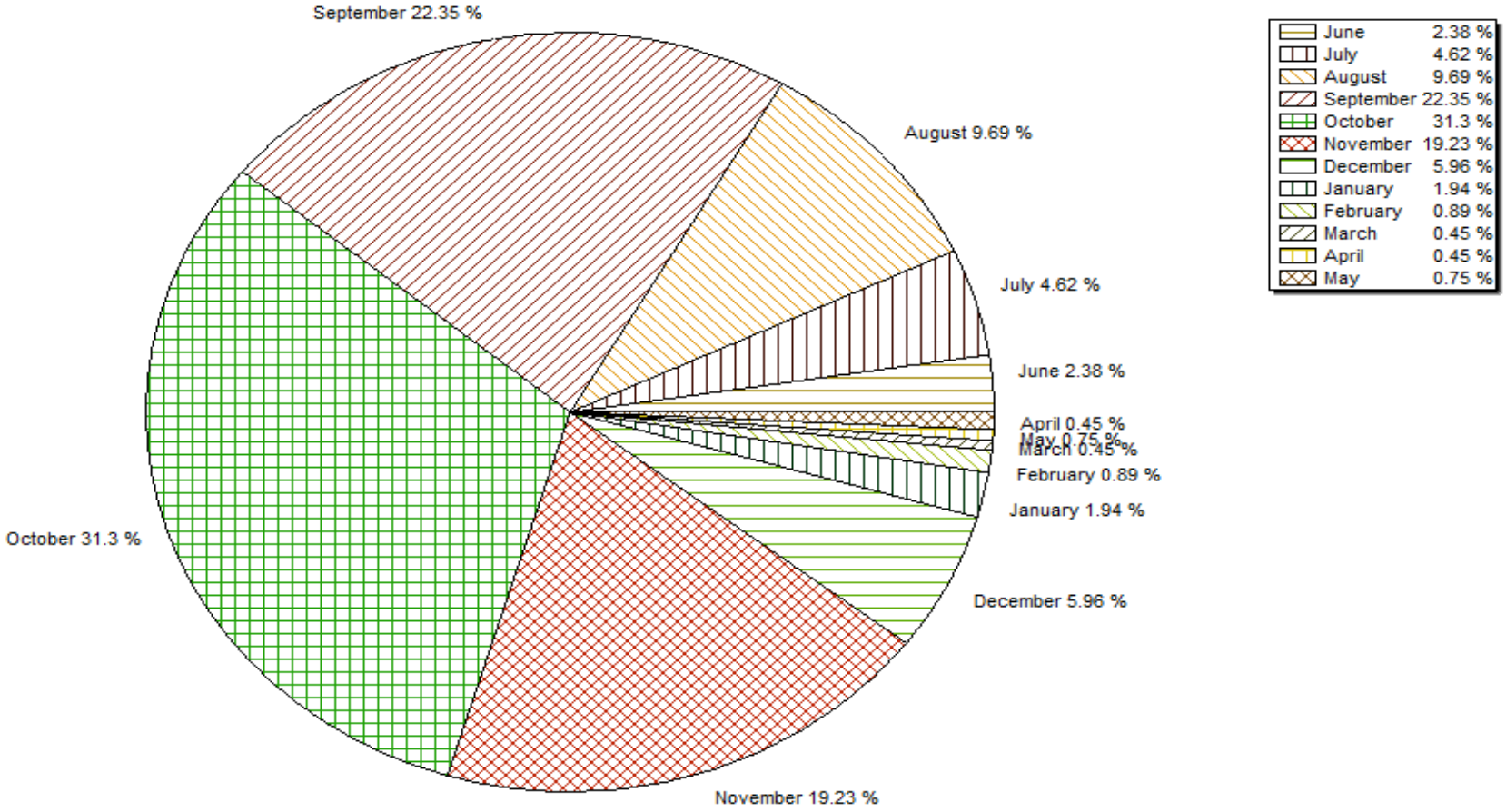


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period : 1991-2016

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

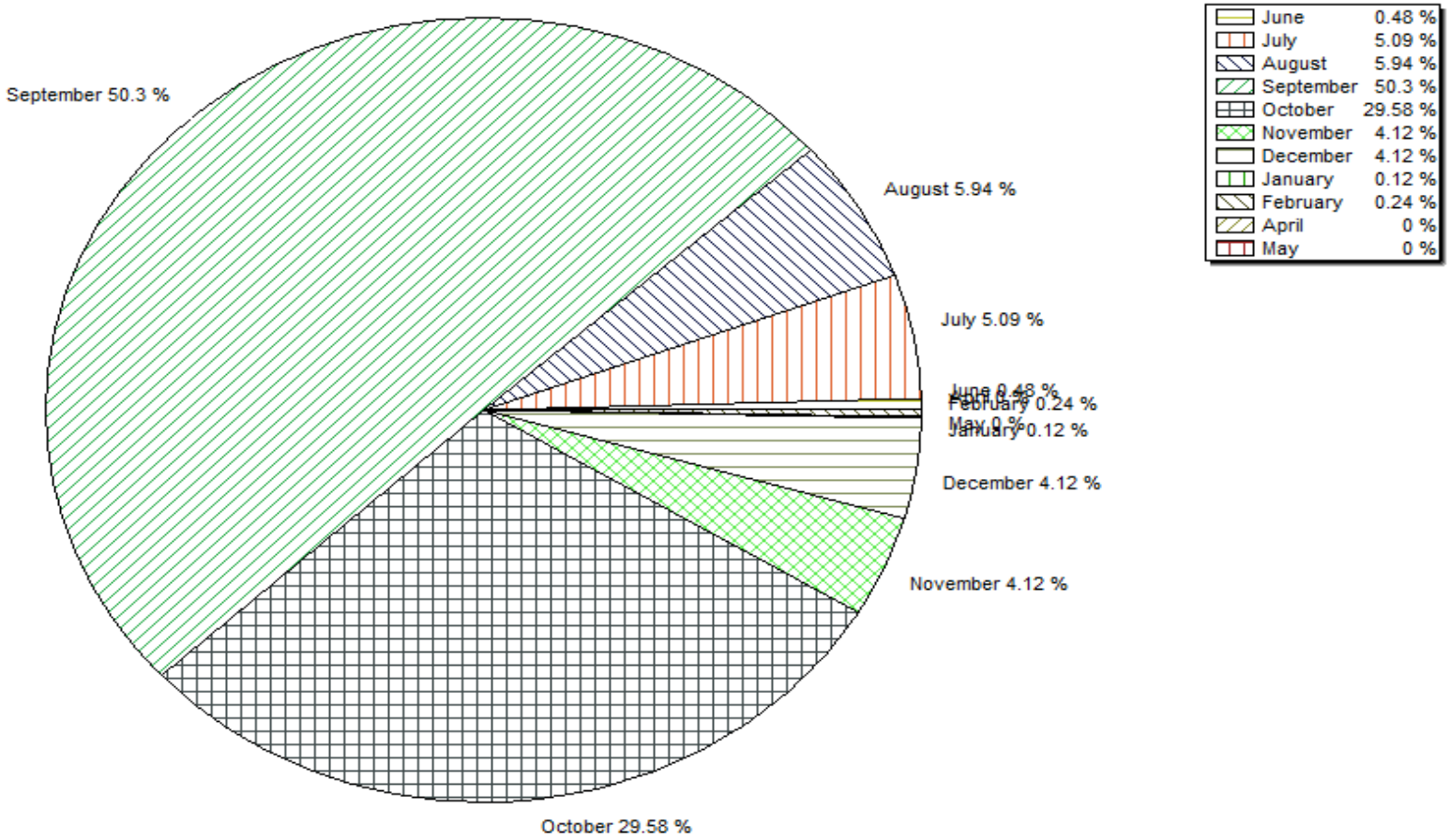
Local River : Sarada **Sub-Division : Behrampur**



Monthly Runoff for the Year : 2016-2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

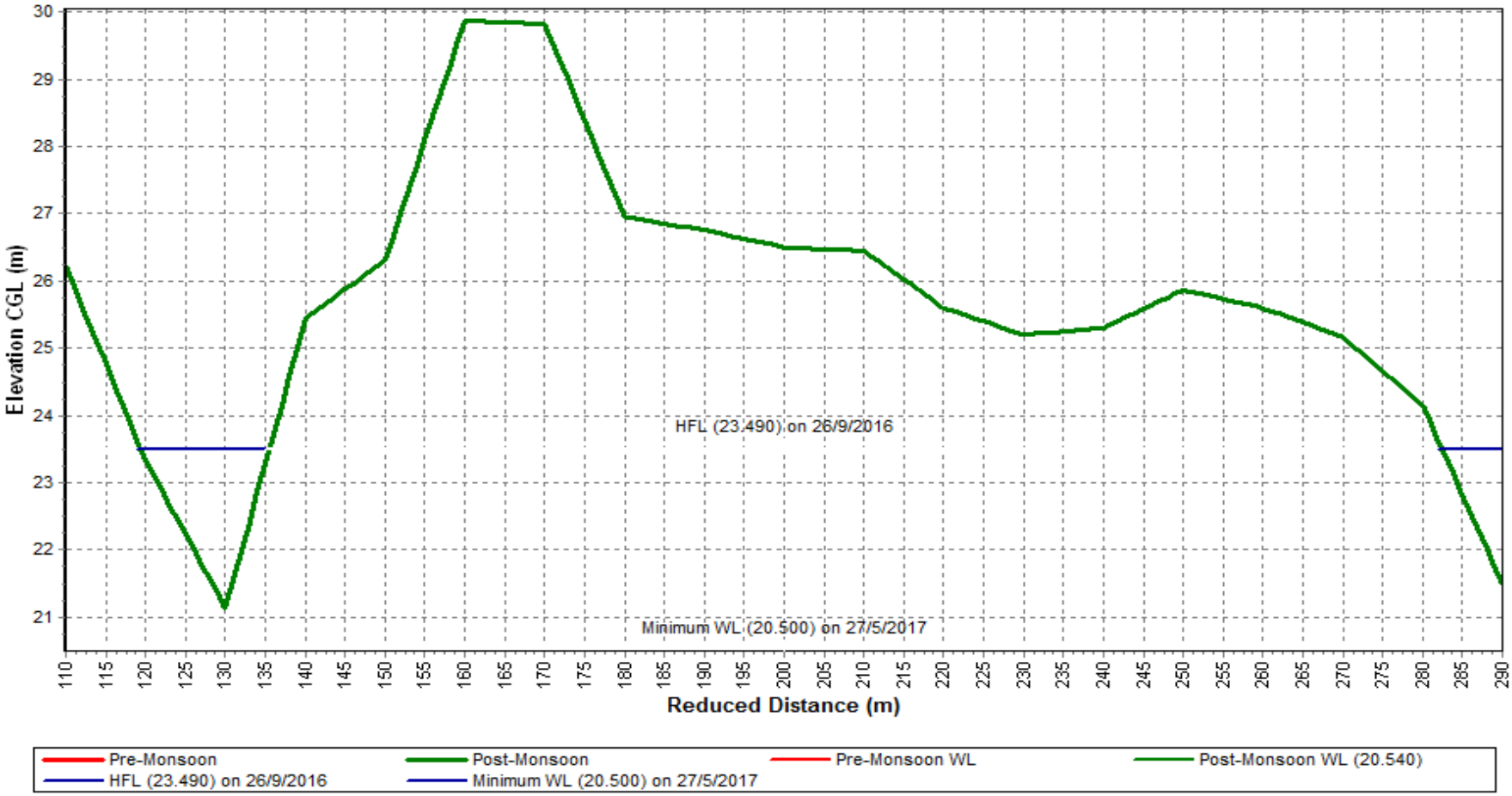
Local River : Sarada **Sub-Division : Behrampur**



Pre-Monsoon & Post-Monsoon X-Section for Water Year : 2016-2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

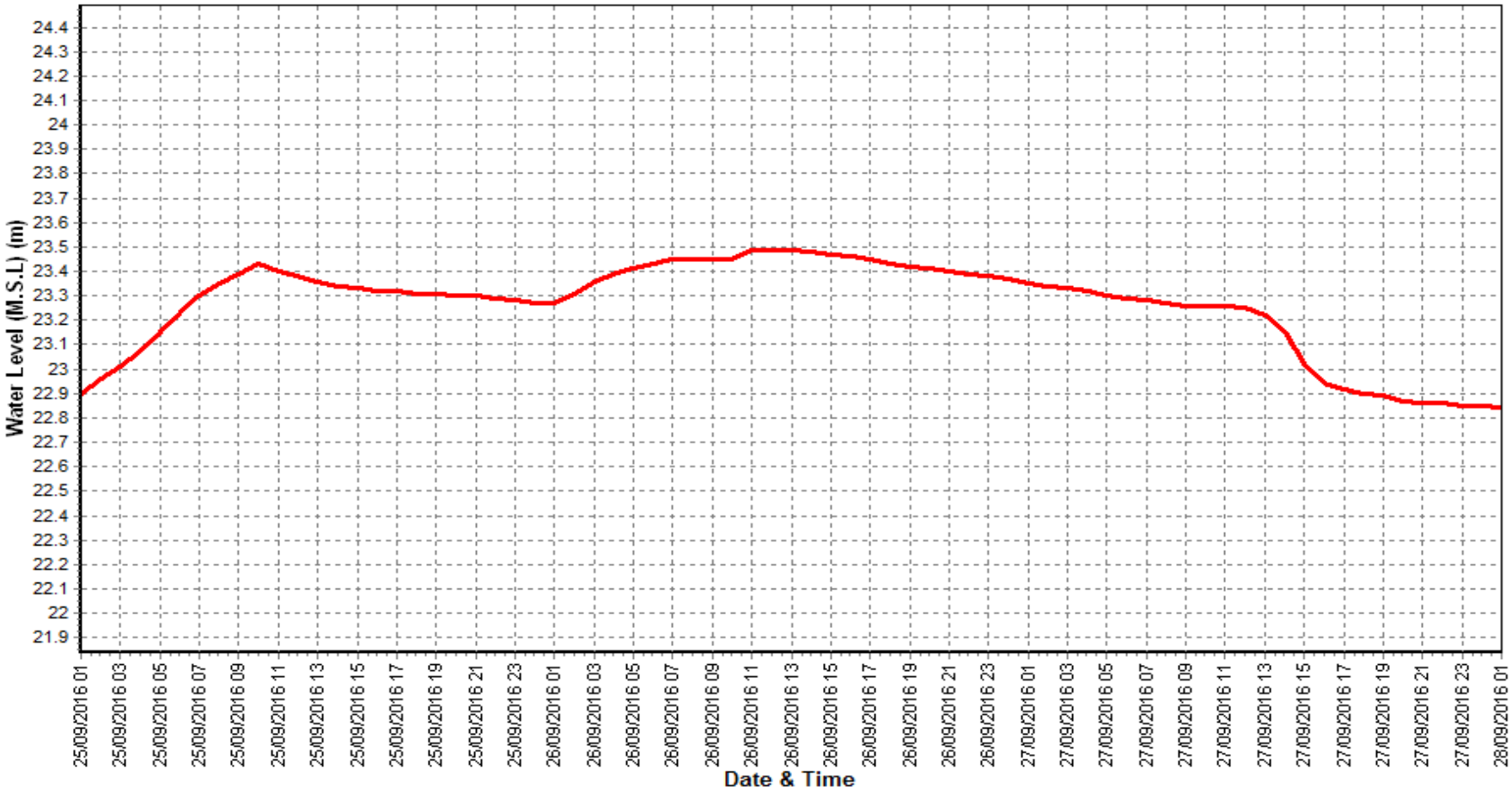
Local River : Sarada **Sub-Division : Behrampur**



Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

Local River : Sarada **Sub-Division : Behrampur**

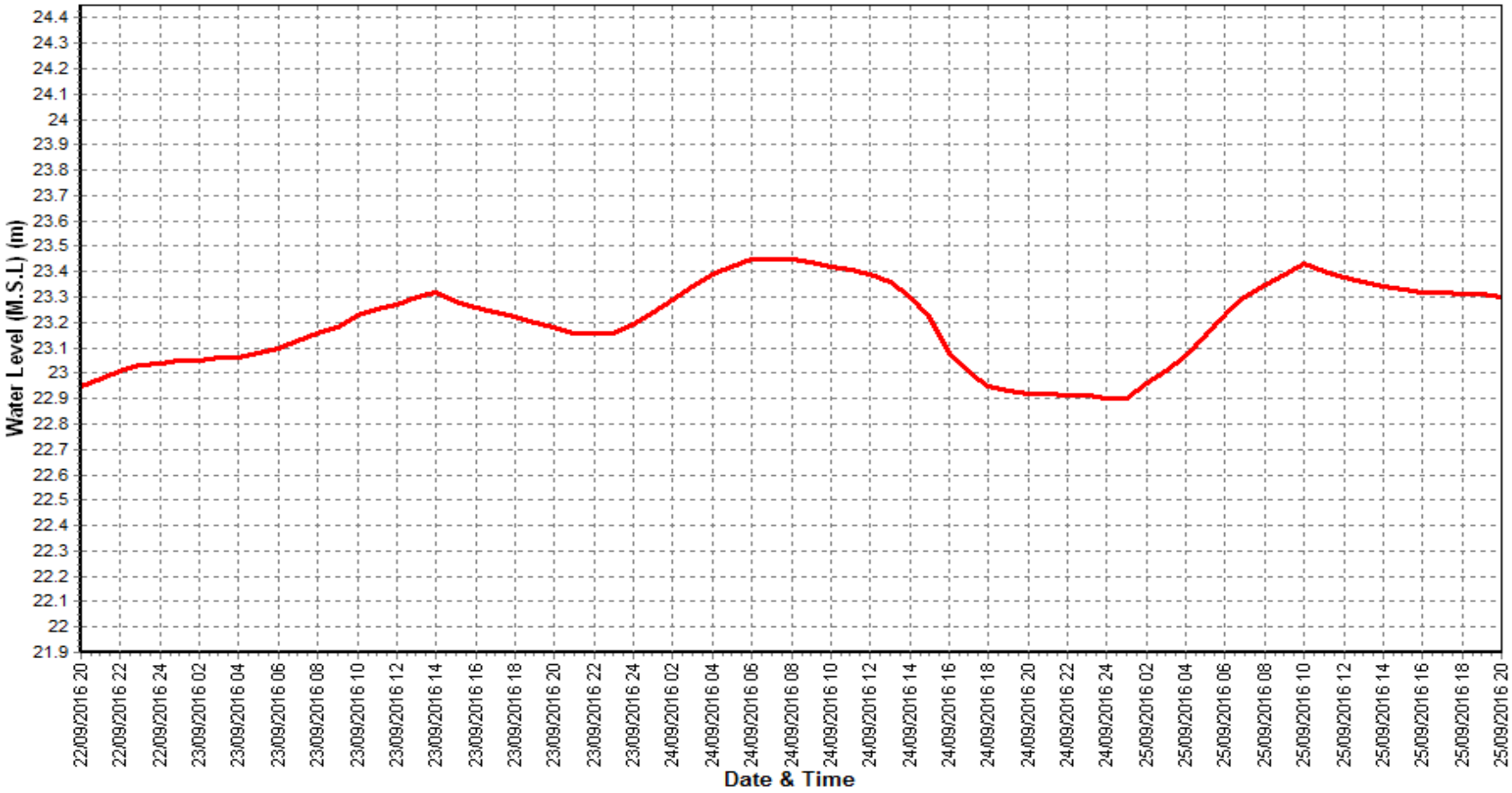


Time Span: 72 Hrs

Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year : 2016-2017

Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

Local River : Sarada **Sub-Division : Behrampur**

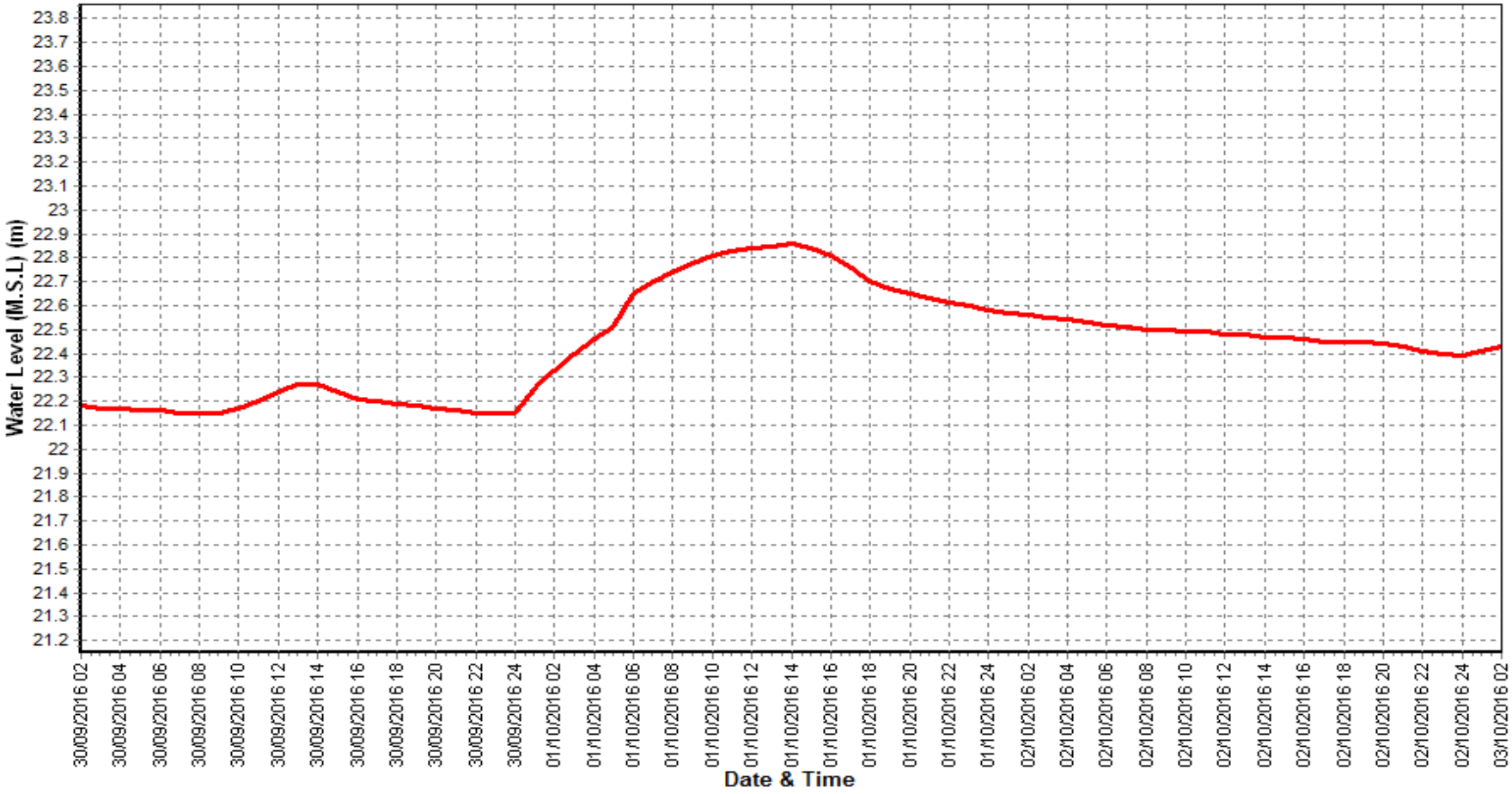


Time Span: 72 Hrs

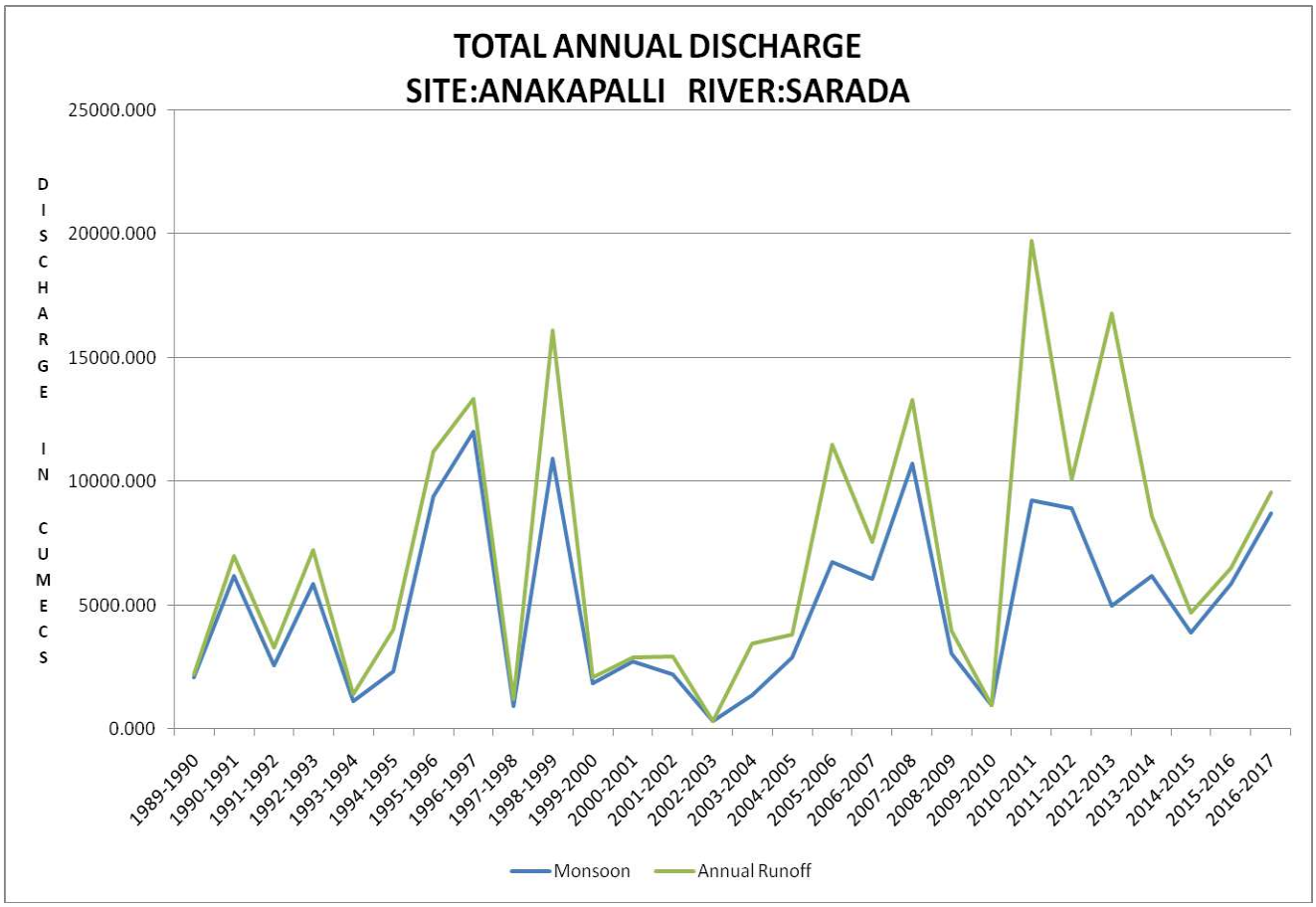
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year : 2016-2017

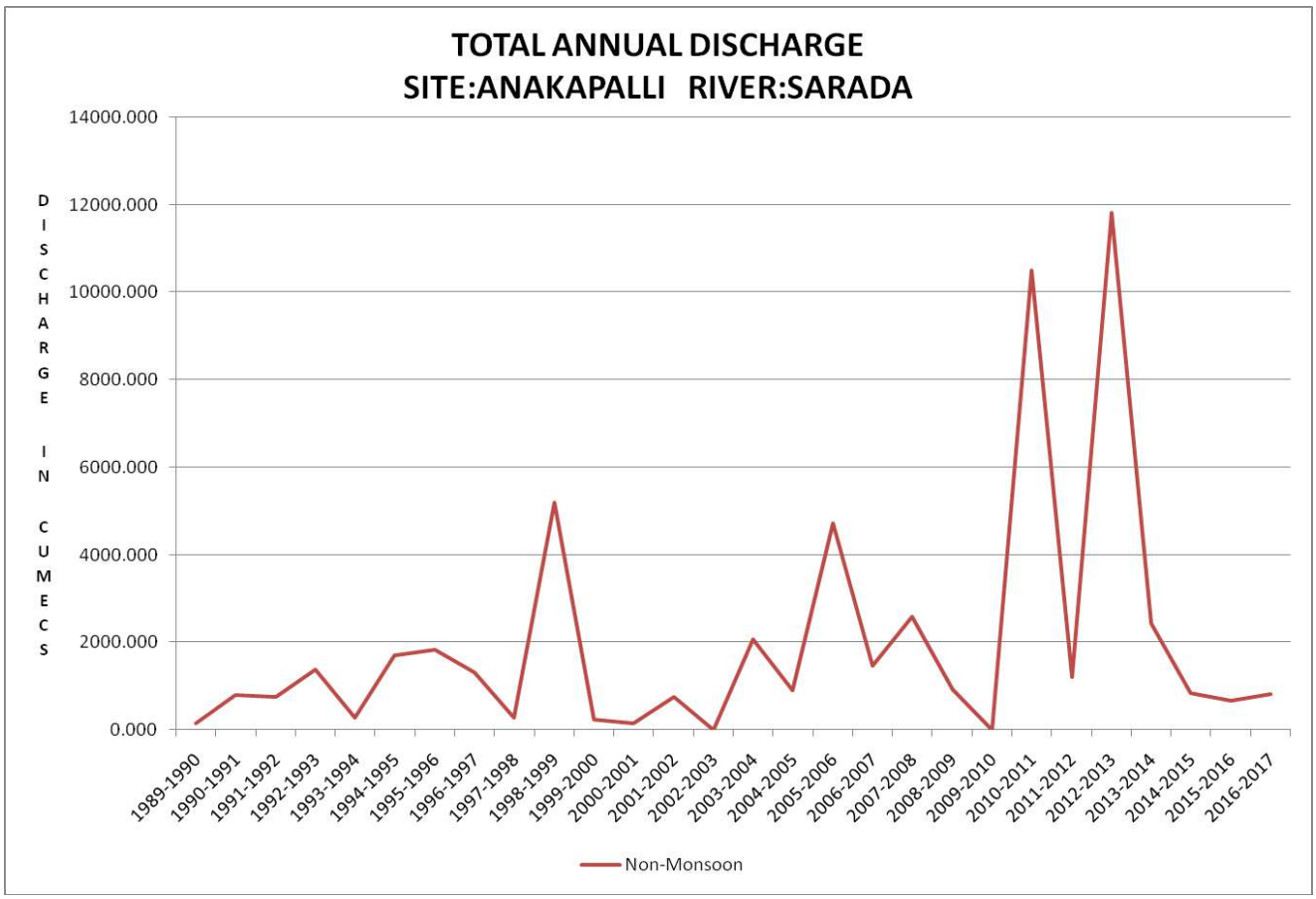
Station Name : ANAKAPALLI (AS000S3) **Division : E.E., Bhubaneswar**

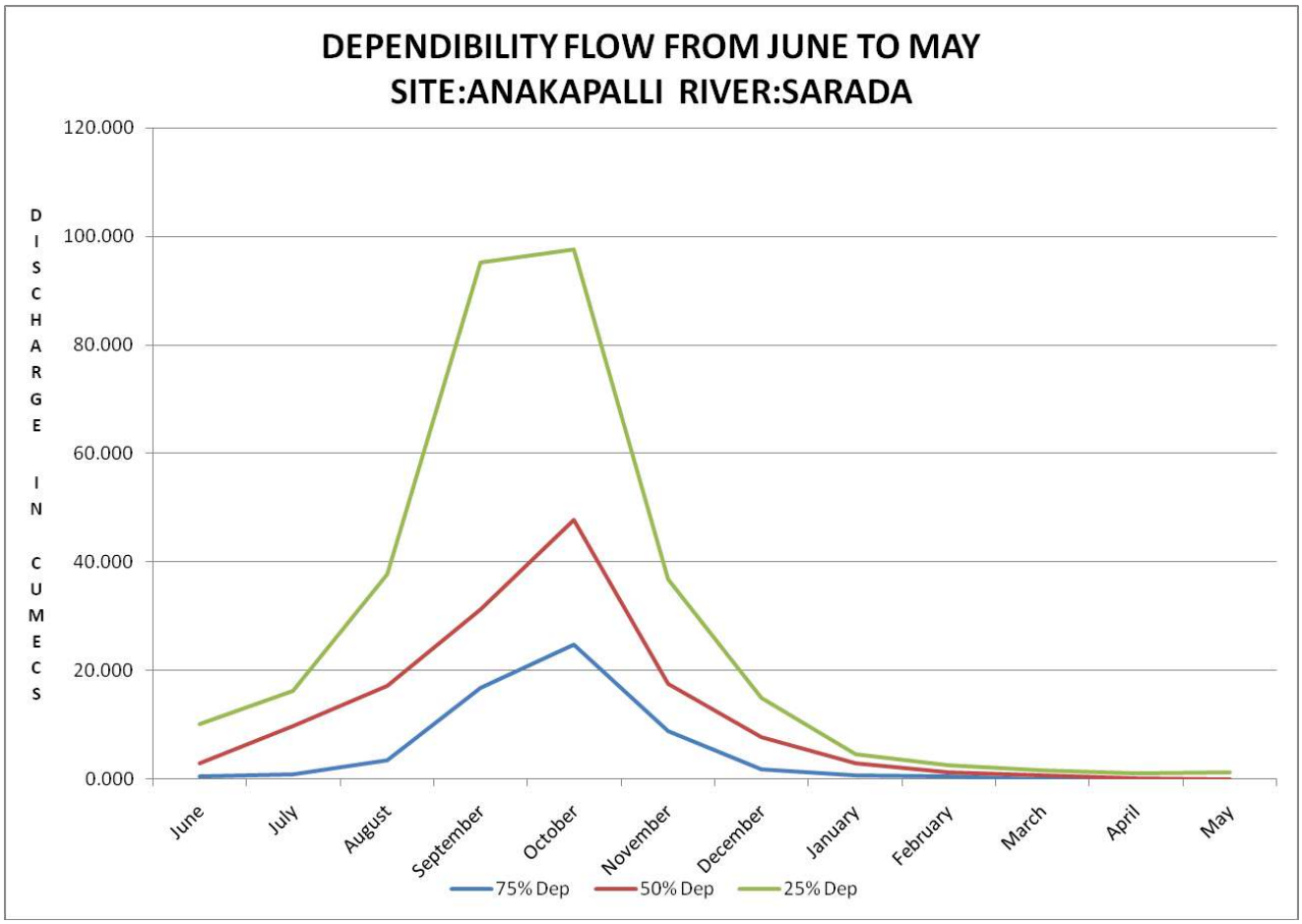
Local River : Sarada **Sub-Division : Behrampur**

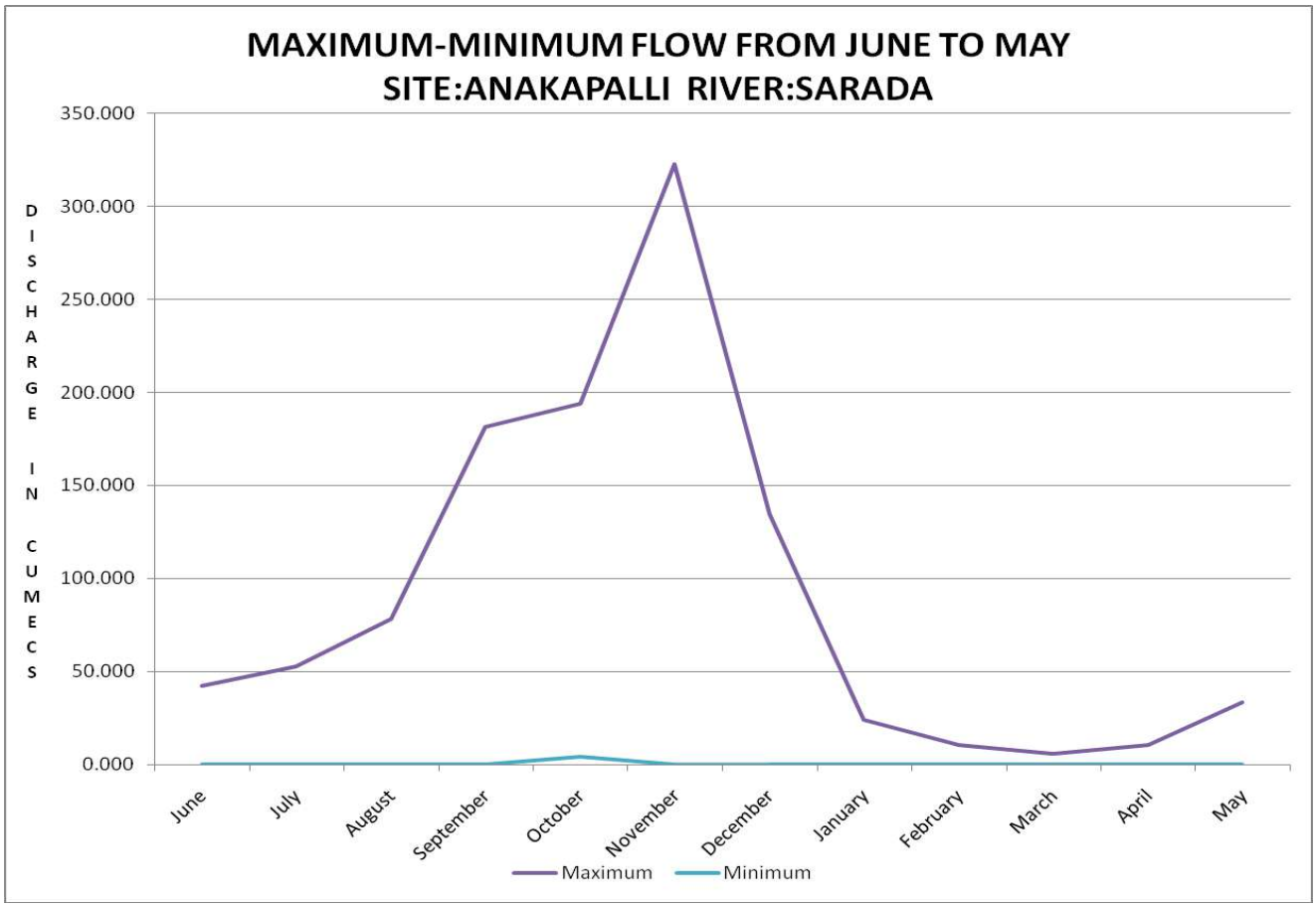


Time Span: 72 Hrs


TOTAL ANNUAL DISCHARGE
SITE:ANAKAPALLI RIVER:SARADA
DISCHARGE IN CUMECS
25000.000
20000.000
15000.000
10000.000
5000.000
0.000
1989-1990
1990-1991
1991-1992
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Monsoon
Annual Runoff


TOTAL ANNUAL DISCHARGE
SITE:ANAKAPALLI RIVER:SARADA
DISCHARGE IN CUMECS
14000.000
12000.000
10000.000
8000.000
6000.000
4000.000
2000.000
0.000
1989-1990
1990-1991
1991-1992
1992-1993
1993-1994
1994-1995
1995-1996
1996-1997
1997-1998
1998-1999
1999-2000
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
Non-Monsoon


DEPENDIBILITY FLOW FROM JUNE TO MAY
SITE:ANAKAPALLI RIVER:SARADA
DISCHARGE IN CUMECS
120.000
100.000
80.000
60.000
40.000
20.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
75% Dep
50% Dep
25% Dep


MAXIMUM-MINIMUM FLOW FROM JUNE TO MAY
SITE:ANAKAPALLI RIVER:SARADA
DISCHARGE IN CUMECS
350.000
300.000
250.000
200.000
150.000
100.000
50.000
0.000
June
July
August
September
October
November
December
January
February
March
April
May
Maximum
Minimum

LIST OF PERSONS INVOLVED IN THE PREPARATION OF WATER YEAR BOOK

1. Sri. C. Mohanty, Executive Engineer, ERD, CWC, Bhubaneswar
2. Sri. D.S. Prasad, AEE, H.O. Circle, CWC, Bhubaneswar
3. Sri. S.P. Rao, SDE, Vamsadhara Sub-Division, Berhampur
4. Dr. B.S Shanthala Devi, EAD, ERD, CWC, Bhubaneswar
5. Sri. B.B. Nayak, AE(HQS), ERD, CWC, Bhubaneswar
6. Sri. N.K. Bhuyan, ARO, ERD, CWC, Bhubaneswar
7. Sri. S.S. Mohanty, Sr. Computer, ERD, CWC, Bhubaneswar
8. Sri. Ashok Mishra, SWA,ERD, Bhubaneswar