केवल शासकीय उपयोग हेतु

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एकीकृत जलवर्षपुस्तिका
जून 2018- मई 2019
नर्मदा बेसिन

INTEGRATED WATER YEAR BOOK
JUNE 2018– MAY 2019
NARMADA BASIN

केन्द्रीय जल आयोग
नर्मदा बेसिन संगठन भोपाल
नवंबर 2019

Central Water Commission
Narmada Basin Organisation, Bhopal
November 2019

प्रस्तावना

राष्ट्रीय जल नीति में जल संसाधन से सम्बंधित आकड़ों के एकत्रीकरण एवं उनकी उपलब्धता हेतु सूचना केंद्र के मानकीकरण पर जोर दिया गया हैं ताकि इस कार्य में संलग्न केंद्र सरकार एवं राज्य सरकार के विभिन्न विभागों के उच्च स्तरीय आकड़ें सुगमता से उपलब्ध हो सके तथा इन आकड़ों के विश्लेषित किये जाने की क्षमता बढ़ाई जा सके इसका महत्त्व इसलिए भी हैं कि इससे जल संसाधनों के अधिकतम उपयोग हेतु वभिन्न कार्यों के लिए लगातार बढ़ती मांग के परिपेक्ष्य में प्रभावी योजनाए बनाई जा सकती हैं |

केन्द्रीय जल आयोग जल संसाधनों के विकास में संलग्न भारत सरकार, जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्रालय के अंतर्गत देश की एक शीर्षस्थ तकनीकी संस्था है इस संस्था के द्वारा जल वैज्ञानिकी आकड़ों के एकत्रण से लेकर परियोजनाओं के मूल्यांकन, अभिकल्पन, प्रबोधन तथा परिचालन से सम्बंधित कार्य किये जा रहे हैं | नर्मदा एवं उनकी सहायक नदियों पर स्थित 16 स्थलों पर नर्मदा बेसिन संगठन के अंतर्गत नर्मदा मंडल, भोपाल द्वारा एवं नर्मदा बेसिन पर स्थित 2 स्थलों पर माही तापी बेसिन संगठन, गांधीनगर के अंतर्गत कार्यरत तापी मंडल, सूरत द्वारा जल वैज्ञानिकी आकड़ें एकत्रित किये जाते हैं, जिनका संकलन इस पुस्तिका में किया गया हैं | इन आकड़ों के अतिरिक्त मध्य प्रदेश के जल संसाधन विभाग के अंतर्गत नर्मदा बेसिन में स्थित स्थल बिजौरा के आकड़ों को संकलित कर कुल 19 जल वैज्ञानिकी स्थलों के आकड़ें इस पुस्तिका में संकलित किये गए हैं |

जल वर्ष पुस्तिका 2018-19 को नदी आकड़ें निदेशालय, केन्द्रीय जल आयोग, नई दिल्ली के पत्र क्र. 4/50/2005/RD/WYBF/3329-95, दिनांक 19.11.2005 द्वारा जारी किये गए मार्गदर्शन के अनुसार संकलित व परिष्कृत कर विभिन्न तकनीकी माध्यमों से प्रदर्शित किया गया हैं |

इस पुस्तक की समस्त जानकारी के एकत्रण, संकलन, विश्लेषण एवं सम्पादन से सम्बद्ध केन्द्रीय जल आयोग के अधिकारियों एवं कर्मचारियों के द्वारा किया गया अथक परिश्रम एवं समपर्ण सराहनीय है | मैं, केंद्र एवं राज्य सरकार के विभिन्न विभाग, केन्द्रीय भू जल बोर्ड, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, जनगणना विभाग, नर्मदा घाटी विकास प्राधिकरण, नर्मदा जल विद्युत् विकास निगम लिमिटेड तथा पर्यावरण प्रदूषण नियंत्रण संगठन आदि के साथ उन सभी का आभारी हूँ, जिन्होंने इस पुस्तक से सम्बंधित विविध जानकारियाँ उपलब्ध कराने तथा प्रकाशन में सहयोग एवं सहायता दी |

(प्रदीप कुमार ठाकुर)

अधीक्षण अभियंता(समन्वय)

स्थान : भोपाल

नवम्बर 2019

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CWC	:	Central Water Commission
IMD	:	India Meteorological Department
WRD of GoMP	:	Water Resources Department of Government of Madhya Pradesh
NCA	:	Narmada Control Authority
MCM	:	Million Cubic Metres
Cumec	:	Cubic Metre Per Second
Ha	:	Hectare
ha^2	:	Square Hectare
ha^3	:	Cubic Hectare (Million cubic metres)
M.S.L.	:	Mean sea level
F	:	Float Observation
FF	:	Flood forecasting
G	:	Gauge
GTS	:	Great Trigonometrical Survey
Hrs	:	Hours
IWYB	:	Integrated Water Year Book
Hm^3	:	Hectometre Cube = Million Cubic Metre
Mm	:	Millimetre
M	:	Metre
m^3/s	:	Cubic Metre Per Second
^{o}	:	Degree (00^o)
’	:	Minute (00’)
”	:	Second (00”)
80 key	:	80 key Hydrological Station Scheme
67 key	:	67 key Hydrological Station Scheme

1 Introduction

1.1 General

Central Water Commission (CWC) is conducting hydrological observations on major river basins under National Network which was initially started under 80 Key Stations, 163 Key Stations and Flood Forecasting schemes. Presently hydrological sites are operated under Plan & Non Plan schemes named "*Development of Water Resources Information Systems*" and "*Flood Forecasting*" of Central Water Commission. This Water Year Book presents data of 17 hydrological observation stations for the year 2018-19in Narmada basin. The data of 17 hydrological observation sites, which is presented in this publication, have been collected by Narmada Division, Bhopal & Tapi Division, Surat of CWC. Out of 17 sites in Narmada Basin, 02 sites viz., Orsang at Chandwada and Narmada at Garudeshwar are being maintained by Tapi Division, Surat; 01 site named Narmada at Bijora is being maintained by WRD, Govt of Madhya Pradesh; while the remaining 14 sites are being maintained by Narmada Division, Bhopal. Jurisdiction of Narmada Division is as given in Figure 2-3**.**

State Government Sites in Madhya Pradesh are operated by the Director (Hydromet), WRD, Bhopal. The data of one site i.e. Narmada at Bijora have been obtained from the State Government and included in the Water Year Book.

The classification and scheme wise distribution of hydrological observation stations is presented in Table 1-1andTable 2-1respectively.

Table 1-1 Classification of Hydrological Observation Stations

S. No.	Site	River	Basin	Code	Type
1.	Narmada at Dindori	Narmada	Narmada	010215001	GDWQ
2.	Narmada at Manot	Narmada	Narmada	010215002	GDSWQ
3.	Burhner at Mohgaon	Burhner	Narmada	010215004	GDSWQ
4.	Banjar at Bamni	Banjar	Narmada	--	GDSWQ
5.	Hiran at Patan	Hiran	Narmada	010215009	GDWQ
6.	Sher at Belkheri	Sher	Narmada	010215010	GDWQ
7.	Narmada at Barmanghat	Narmada	Narmada	010215011	GDSWQ
8.	Shakkar at Gadarwara	Shakkar	Narmada	010215012	GDSWQ
9.	Narmada at Sandia	Narmada	Narmada	010215013	GDSWQ
10.	Narmada at Hoshangabad	Narmada	Narmada	010215019	GDSWQ
11.	Ganjal at Chhidgaon	Ganjal	Narmada	010215020	GDWQ
12.	Narmada at Handia	Narmada	Narmada	010215022	GDSWQ
13.	Kundi at Kogaon	Kundi	Narmada	010215025	GDWQ

S. No.	Site	River	Basin	Code	Type
14.	Narmada at Mandleshwar	Narmada	Narmada	010215026	GDSWQ
15.	Narmada at Garudeshwar	Narmada	Narmada	010215030	GDSWQ
16.	Orsang at Chandwada	Orsang	Narmada	010215032	GDSWQ
17.	Narmada at Bijora	Narmada	Narmada	--	GD

Table 1-2 Schemewise Distribution of Sites

Sl No.	Name of Site	Station Code No.	Scheme
I	**2711 Flood Forecasting**		
1.	Narmada at Dindori	010215001	Plan
2.	Narmada at Manot	010215002	Plan
3.	Burhner at Mohgaon	010215004	Plan
4.	Banjar at Bamni	--	Plan
II	**2701 –DWRIS-Data Collection**		
5.	Orsang at Chandwada	010215032	Non Plan
6.	Hiran at Patan	010215009	Non Plan
7.	Sher at Belkheri	010215010	Non Plan
8.	Narmada at Barmanghat	010215011	Non Plan
9.	Shakkar at Gadarwara	010215012	Non Plan
10.	Narmada at Sandia	010215013	Non Plan
11.	Narmada at Hoshangabad	010215019	Non Plan
12.	Ganjal at Chhidgaon	010215020	Non Plan
13.	Narmada at Handia	010215022	Non Plan
14.	Kundi at Kogaon	010215025	Non Plan
15.	Narmada at Mandleshwar	010215026	Non Plan
16.	Narmada at Garudeshwar	010215030	Non Plan
III	**Govt. of Madhya Pradesh**		
17.	Narmada at Bijora	..	State Govt. Site

The river basin description is given in Section-2

1.2 Organisation of the Water Year Book

The WaterYear Book gives detailed description of river basin, its river system, climatic characteristics, geology along with methodology of stream flow data collection, its availability and hydrological data observed at various stations during the year. The station wise data sheet presents various parameters like monthly flow

summary, 10-daily as well as monthly mean flows besides peak flow results. The analysed data has also been presented in form of charts and maps.

The Year Book runs under four sections as given below.

Section-1: Introduction

Section-2: Basin Description

Section-3: Stream Flow Data

Section-4: Hydrological Data

2 Narmada Basin Description

2.1 Geographical Description of Narmada Basin

The Narmada is the largest West flowing and fifth largest river of India. It drains a large area in Madhya Pradesh besides some area in the states of Maharashtra and Gujarat. The Narmada basin lies between East Longitudes 72^{o} 32' to 81^{o} 45' and North Latitudes 21^{o} 20' to 23^{o} 45'. It flows through Deccan trap in between Vindhya and Satpura ranges of hills before falling into the Gulf of Cambay in the Arabian Sea.

The Narmada drains an area of 98796 sq km. out of which nearly 87% lies in Madhya Pradesh. The statewise distribution of drainage area is shown in **Table 2-1**.

Table 2-1 Statewise Distribution of Drainage Area

Sl. No.	Name of State	Drainage Area (sq km)	Percentage
1.	Madhya Pradesh	85859	86.9
2.	Maharashtra	1538	1.5
3.	Gujarat	11399	11.6
	Total	**98796**	**100**

The details of CWC hydrological observation stations are given in Table 2-2. Further, there are 31 gauge/gauge and discharge sites being maintained by State Government of Madhya Pradesh and 12 gauge/gauge and discharge sites being maintained by State Government of Gujarat in Narmada basin. The details of the sites maintained by the State Government of Madhya Pradesh are given in Table 2-3. The line diagram of Narmada basin showing the observation stations is given in Figure 2-1.

Table 2-2 Central Water Commission, Govt. of MP and NCA Sites

Sl No.	Name of Site	Station Code No.	Scheme
1.	Narmada at Dindori	010215001	2711 Flood Forecasting (Plan)
2.	Narmada at Manot	010215002	2711 Flood Forecasting (Plan)
3.	Burhner at Mohgaon	010215004	2711 Flood Forecasting (Plan)
4.	Banjar at Bamni	--	2711 Flood Forecasting (Plan)

5.	Narmada at Bijora	--	Govt. of MP
6.	Hiran at Patan	010215009	2701 DWRIS Data Collection (Non Plan)
7.	Sher at Belkheri	010215010	2701 DWRIS Data Collection (Non Plan)
8.	Narmada at Barmanghat	010215011	2701 DWRIS Data Collection (Non Plan)
9.	Shakkar at Gadarwara	010215012	2701 DWRIS Data Collection (Non Plan)
10.	Narmada at Sandia	010215013	2701 DWRIS Data Collection (Non Plan)
11.	Narmada at Hoshangabad	010215019	2701 DWRIS Data Collection (Non Plan)
12.	Ganjal at Chhidgaon	010215020	2701 DWRIS Data Collection (Non Plan)
13.	Narmada at Handia	010215022	2701 DWRIS Data Collection (Non Plan)
14.	Kundi at Kogaon	010215025	2701 DWRIS Data Collection (Non Plan)
15.	Narmada at Mandleshwar	010215026	2701 DWRIS Data Collection (Non Plan)
16.	Narmada at Garudeshwar	010215030	2701 DWRIS Data Collection (Non Plan)
17.	Orsang at Chandwada	010215032	2701 DWRIS Data Collection (Non Plan)

Table 2-3 State Government Sites

Sl. No.	StationName	Type	Sl. No.	StationName	Type
1	Narmada at Mortakka	GDS	17	Beda at Lower Beda	GD
2	Narmada at Sankalghat	GD	18	Undri at Gadigatter	GD
3	Narmada at Jansighat	GD	19	Jamner at Sandalpur	GD
4	Narmada at Jamtara	GD	20	Ganjal at Chhidgaon	G
5	Narmada at Bargi	GD	21	Beda at Upper Beda	GD
6	Narmada at Mandla	GD	22	Kolar at Satrana	GD
7	Narmada at Manot	GD	23	Kolar at Lawakheda	G
8	Narmada at Bijora	GD	24	Barna at Bareli	GD
9	Hathni at Tikola	G	25	Tawa at Bagratawa	G
10	Hathni at Hatnia	GD	26	Tendoni at Maheshwar	GD
11	Sukari at Sukkad	G	27	Banjar at Hirdayanagar	G
12	Deb at Lingwa	G	28	Pariyat at Tikheria	G
13	Man at Ajandiman	GD	29	Banjar at Bamni Banjar	G

Sl. No.	StationName	Type
14	Kundia at Badi	G
15	Kundi at Dejla Dewda	G
16	Man at Man Project	GD

Sl. No.	StationName	Type
30	Burhner at Parastala	G
31	Kharmer at Shakkar	G

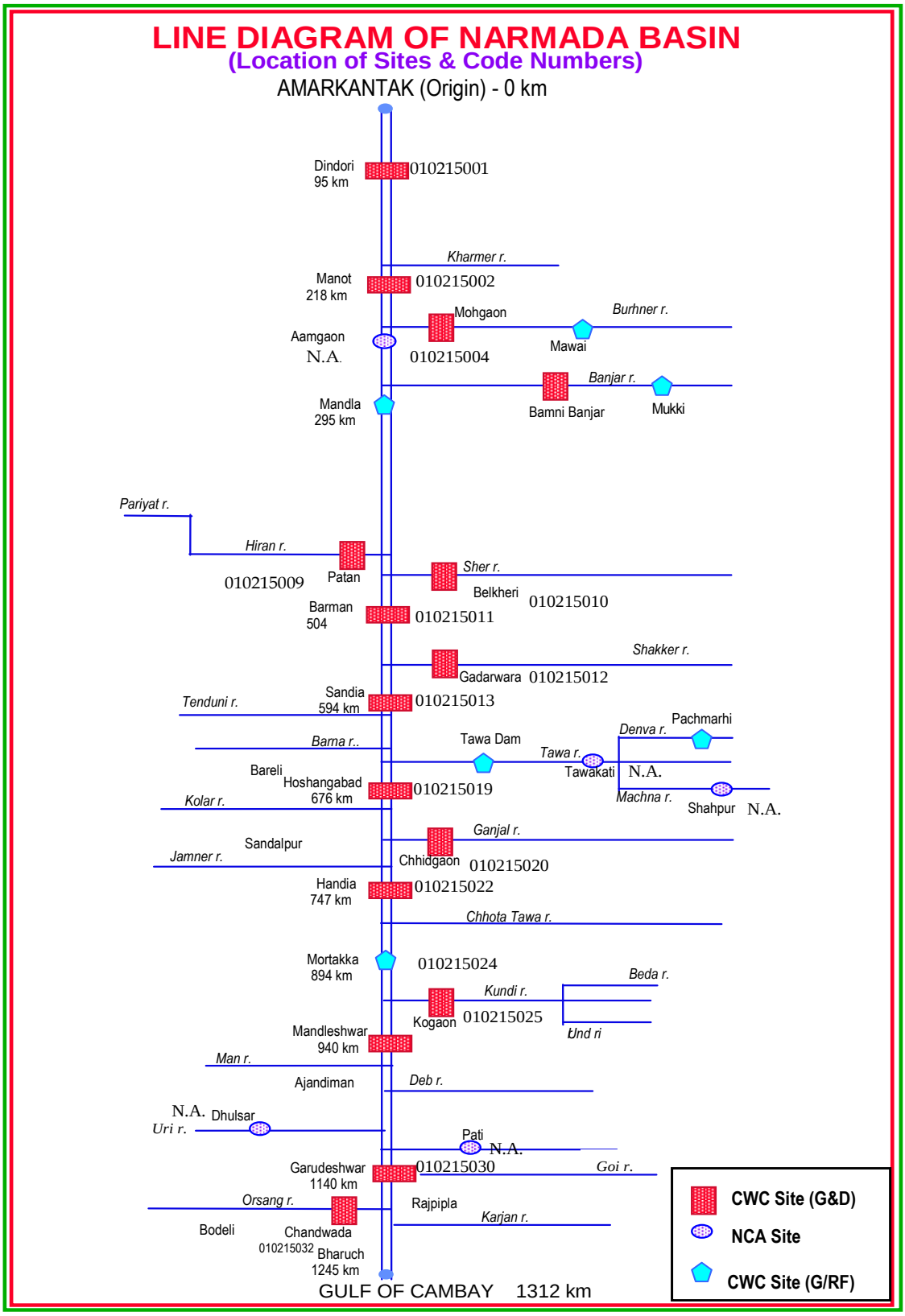


Figure 2-1 Line Diagram of Narmada Basin (Location of Sites and Code Numbers)

2.2 Description of the River System

The Narmada originates from a Kund (spring) at an elevation of 1057m at Amarkantak in the Maikal hill in Shahdol district of Madhya Pradesh and flows through Madhya Pradesh, Maharashtra and Gujarat between Vindhya and Satpura hill ranges before falling into the Gulf of Cambay in the Arabian Sea, about 10 km north of Bharuch, Gujarat. The total length of this west flowing river from its origin to its outfall into the Arabian Sea is 1312 km. For the first 1079 km it flows in Madhya Pradesh and thereafter forms the common boundary between Madhya Pradesh and Maharashtra for 35 km, and Maharashtra and Gujarat for 39 km. In GujaratState it stretches for 159 km.

There are 41 important tributaries to the Narmada river. Significant among them are Burhner, Banjar, Hiran, Tawa, Chhota Tawa, Orsang and Kundi which are major tributaries having catchment area more than 3500 sq km. The remaining tributaries are having catchment area ranging from 500 to 2500 sq km.The catchment area, length and elevation of the origin of the important tributaries are indicated in Table 2-4.

Table 2-4 Important Tributaries

Sl. No	Tributary	Bank	Elevation of Origin above MSL (m)	Catchment Area (km^2)	Total length from origin (km)
1	Kharmer	Left	-	557	64.0
2	Silgi	Right	-	531	65.0
3	Burhner	Left	900	4228	177.0
4	Banjar	Left	600	3282	183.0
5	Balai	Right	-	531	46.0
6	Temur	Left	550	892	54.0
7	Gaur	Right	690	1107	79.5
8	Soner	Left	-	581	51.0
9	Hiran	Right	500	4795	188.0
10	Sher	Left	650	2903	129.0
11	Biranjo	Right	-	1172	62.0
12	Shakkar	Left	900	2294	161.0
13	Dudhi	Left	900	1542	129.0
14	Sukhri	Left	-	609	39.0
15	Tendoni	Right	500	1633	177.0
16	Barna	Right	450	1789	105.0
17	Tawa	Left	600	6338	172.0
18	Hather	Left	-	645	37.5
19	Kolar	Right	600	1348	101.0
20	Ganjal	Left	700	1931	89.0
21	Sip	Right	-	879	45.0

Sl. No	Tributary	Bank	Elevation of Origin above MSL (m)	Catchment Area (km^2)	Total length from origin (km)
22	Jamner	Right	470	671	30.0
23	Chankesher	Right	600	1249	30.0
24	Anjal	Left	-	1203	62.5
25	Machak	Left	550	1112	87.5
26	Chhota Tawa	Left	400	5055	169.0
27	Khari	Right	-	754	41.0
28	Kenar	Right	-	1581	62.5
29	Kaveri	Left	-	954	32.5
30	Choral	Right	-	601	55.0
31	Kharkia	Left	-	1099	24.0
32	Kundi	Left	900	3973	120.0
33	Karan	Right	-	858	45.0
34	Board	Left	-	866	62.5
35	Man	Right	550	1529	89.0
36	Deb	Left	350	969	82.5
37	Uri	Right	-	2004	74.0
38	Goi	Left	800	1892	129.0
39	Hatni	Right	350	1944	30.0
40	Orsang	Right	300	3946	101.0
41	Karjan	Left	200	1490	93.0

2.3 Climate Characteristics

2.3.1 Temperature

Temperature of Narmada Basin varies like any other part of Central India. The difference between the maximum & minimum temperature, in any part of the basin, is quite pronounced. The temperature is maximum in the month of May and minimum in the month of January. In general, the upper NarmadaBasin records lower temperature as compared to middle basin. In lower section of the basin, the influence of the sea is prominent, and temperature though lower than the middle basin, is still higher than the upper reaches of NarmadaRiver. The temperature profile in the basin is given in the Figure 2-4 and Table 2-5.

Table 2-5 Temperature Data of Narmada Basin

Month/ Location	Mean Monthly Maximum Temperature (^oC)						Mean Monthly Minimum Temperature (^oC)					
	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	26.6	22.4	29.3	26.1	24	29.6	12.7	8.7	12.0	9.0	10.9	12.7
February	29.8	24.7	31.9	28.9	26.5	32.5	14.3	10.4	13.6	11.4	12.5	14.2
March	34.9	28.9	36.4	34.0	31.5	36.5	18.6	14.8	18.1	15.5	17.6	18.5
April	39.3	33.4	40.2	38.5	36	39.7	23.5	20.1	23.9	20.5	22.3	22.9
May	42.0	36.0	41.9	41.9	39.3	40.6	27.6	24.3	27.9	25.9	26.1	26.8
June	37.6	31.4	37.5	37.6	35.1	36.7	26.6	22.5	26.2	26.4	25.0	27.0
July	30.2	23.3	30.9	30.3	28.7	32.1	24.0	19.9	23.8	23.9	22.8	25.6
August	29.2	23.8	29.9	29.5	28.3	31.1	23.5	19.6	23.2	23.6	22.5	24.9
September	30.7	25.2	31	30.8	28.9	32.7	23.2	19.1	22.7	23.1	22	24.4
October	32.1	26.2	33.4	31.4	28.5	34.9	19.5	14.8	18.9	18.4	18.4	21.4
November	29.3	24.1	31.2	28.9	26.3	33.3	14.5	9.6	13.5	11.7	13.4	16.4
December	27.1	22.8	29.6	26.9	24.2	31	12.3	7.5	11.2	9	10.1	13.5
Annual Mean	32.4	26.9	33.6	32.1	29.8	34.3	20.0	15.9	19.6	18.3	18.6	20.7

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

JA: Jabalpur

PEN: Pendra Road

VA: Vadodara

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994.

2.3.2 Rainfall

The Inter-departmental Committee on Soil Conservation and Afforestation of Sardar Sarovar & Narmada Sagar projects constituted by the Ministry of Agriculture and Rural Development, Government of India had compiled annual & seasonal rain fall data of the Narmada basin between 1901-1950 which is presented in Table 2-6.

Above data suggests that a major portion of the precipitation in the basin takes place during the southwest monsoon, and accounts for about 85% to 95% of the total precipitation. The post monsoon accounts for about 9% of the precipitation whereas the winter and the pre-monsoon, together account for about a maximum of 10% of the total precipitation.

Table 2-6 Rainfall in Districts of Narmada Basin (Average for the period 1901-1950)

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
1	Shahdol	76 (5.4)	58 (4.1)	1184 (84.7)	79 (5.6)	1397
2	Mandla	53 (3.4)	58 (3.7)	1163 (86.8)	86 (5.5)	1570
3	Balaghat	47 (2.9)	47 (2.9)	1447 (89.1)	82 (5.0)	1623
4	Seoni	57 (4.1)	60 (4.3)	1179 (85.1)	89 (6.4)	1385
5	Jabalpur	50 (3.9)	16 (1.2)	1113 (88.8)	67 (5.2)	1274
6	Narsinghpur	33 (2.5)	30 (2.3)	1171 (90.0)	67 (5.1)	1301
7	Sagar	38 (3.1)	24 (1.9)	1113 (90.1)	60 (4.8)	1235
8	Damoh	34 (2.8)	26 (2.1)	1103 (85.6)	61 (5.0)	1224
9	Chhindwara	48 (3.6)	52 (3.9)	11333 (85.6)	91 (6.9)	1324
10	Hoshangabad	23 (1.8)	20 (1.5)	1188 (91.7)	64 (4.9)	1295
11	Betul	35 (3.2)	37 (3.4)	925(85.3)	87 (8.0)	1084
12	Raisen	33 (2.5)	20 (1.5)	1218 (91.6)	58 (4.4)	1330
13	Sehore	19 (1.5)	17 (1.4)	1153 (92.7)	55 (4.4)	1244
14	Khandwa	14 (1.6)	15 (1.7)	786 (89.3)	65 (7.4)	880
15	Khargone	4 (0.5)	13 (1.6)	753 (90.5)	62 (7.4)	832
16	Dewas	13 (1.2)	18 (1.7)	995 (91.9)	57 (5.3)	1083

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
17	Indore	8 (0.8)	17 (1.7)	887 (91.0)	63 (6.5)	975
18	Dhar	5 (0.6)	12 (1.4)	763 (91.6)	53 (6.4)	833
19	Jhabua	6 (0.7)	12 (1.4)	773 (93.3)	37 (4.5)	825
20	Dhule	8 (1.2)	12 (1.8)	596 (88.4)	58 (8.6)	674
21	Vadodara	5 (0.5)	9 (0.9)	917 (94.6)	38 (3.9)	969
22	Bharuch	5 (0.5)	9 (0.9)	892 (93.9)	44 (4.6)	950
	Range	5-76	9-60	596-1363	37-89	674 -1623
		(0.5-5.4)	(0.9-4.3)	(84.7-94.6)	(3.9-8.6)	

Note: Figures in brackets are percentage w.r.t. Annual Rainfall

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994

The recent rainfall data for five years from 2006-10 is shown in the table 2.7

Table2-7 Five Year Average Rainfall for the Districts of the Basin (2006-10)

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
1	Shahdol	17	26	858	16	916
2	Mandla	6	16	1192	40	1253
3	Balaghat	10	52	1202	52	1315
4	Seoni	4	36	1007	38	1085
5	Jabalpur	15	31	1058	46	1151
6	Narsingpur	9	31	927	22	990
7	Sagar	7	31	848	57	942
8	Damoh	10	20	890	35	955
9	Chindwara	3	37	922	60	1022
10	Hoshangabad	7	37	1185	66	1295
11	Betul	7	37	1185	66	1295
12	Raisen	4	8	900	42	954
13	Sehore	6	30	872	54	964

Sl. No.	District	Seasonal Average Rainfall(mm)				Total
		Winter Monsoon (Jan-Feb)	Pre-Monsoon (March-May)	South-West Monsoon (June-Sept)	Post Monsoon (Oct-Dec)	Annual Average Rainfall
14	Khandwa	1	17	730	40	788
15	Khargone	1	11	744	37	792
16	Dewas	0	0	4112	152	4264
17	Indore	11	122	4286	370	4789
18	Dhar	0	5	851	42	897
19	Jhabua	0	3	883	30	915
20	Dhule	0	2	597	66	665
21	Vadodara	0	0	1009	17	1026
22	Bharuch	0	1	780	18	799

Source: Website of Indian Meteorological Department (District rainfall for five years -Hydromet Division)

From the above Table 2-6 and Table2-7 it can be observed that the patternof the precipitation in the basin is almost similar to the past pattern, major portion of the rainfall being taking place during the southwest monsoon.The post monsoon and pre-monsoon account for small parts of the precipitation whereas the winter monsoon has still lesser or no contribution towards the total precipitation. The average rainfall in the basinduring the last five years has decreased at some places (the maximum decrease being about 35% for Shahdol district) while it has increased at other places (the maximum increase being about 391% for Indore district) as compared to the average past rainfall for the period of 1901-1950.This change in average rainfall may be due to climate change and human activities (like land use change).

Figure 2-5 gives the isohyets map of the Narmada Basin. The rainfall is higher in the upper and lower basin, but marginally less in the lower middle and middle basin. The general pattern of the basin is that the rainfall increases from west to east.

From the data of fifty years on intensity of rainfall during a 24 hours period as compiled by the Central Water Commission, it can be concluded that the most intense rain occurs in the southern section of the upper Narmada basin, where 24-hour rainfall is about 360 mm. The least intense rainfall is between Jhabua & Dhar where the 24 hours rainfall is less 260 mm. Details are shown in Figure 2-6**.**

2.3.3 Wind

The wind speed data of the basin is given in Table 2-8. The average monthly wind speed in the Narmada Basin varies between about 1.4 km/h and 16 km/h in the post -monsoon &pre monsoon seasons, the wind speed is generally higher. The maximum percentage of calm occurs between October & December. The predominant wind direction is NW followed by SW and W.

Table 2-8 Wind Speed and Direction Data for Narmada Basin

Month/	Average Wind Speed km/h)						Calm Period %						Dominant Direction					
Location	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	4.2	3.3	5.7	3.4	5.3	7.1	29	29	22	31	20	17	E/NE/SE	NW/N/N	NE/NW/N	SE/NE/N	N/S	N/NW
February	4.2	4.2	6.4	4.0	6.1	6.5	27	20	21	28	18	13	E/NE	NW/W/N	NW/N/NE	SE/NE/N	N/WW	N/NW
March	4.6	4.5	7.4	4.6	7.0	6.7	31	17	15	23	14	13	E/SW/W	NW/W	NW/W	SE/NW/N	N/WW	N/W/NW
April	5.2	5.1	9.6	5.5	7.5	7.3	31	12	6	20	11	8	W/SW	NW/W	NW/W	SE/NW	N/S/NW	NW/N/SW
May	6.4	6.8	14.1	7.1	9.3	12.1	16	6	1	11	7	2	W/SW	NW/N	NW/N	SW/W/NW	N/S/NW	SW/W
June	6.8	7.2	15.8	8.6	9.5	15.6	14	7	2	9	8	2	W/SW	NW/N	NW/W/SW	SW/W	WES/NW	SW/W/W
July	6.1	9.0	14.0	8.2	8.0	13.0	17	7	2	13	14	2	W/WS	NW/W	W/SW	SW/W	S/SW	SW/S/W
August	5.4	8.3	12.4	7.6	6.8	10.7	23	8	2	14	15	4	W/SW	NW/W	W/SW	SW/W	S/NW	SW/W
September	1.4	6.2	9.6	5.7	5.8	7.9	29	10	4	19	12	8	W/SW	NW/W	W/SW	SW/W	N/S/NW	SW/W
October	3.1	3.6	5.3	3.5	4.1	6.4	44	27	17	29	25	26	E/NE	NE	N/NE	SE/NE	N/NW	N/NE/NW
November	3.0	2.8	4.3	2.8	3.7	6.5	42	36	3	32	31	14	E/NE	NE/N	N/NE	SE/NE	N/NW	N/NE/NW
December	3.5	2.7	4.3	2.7	4.1	6.1	36	38	28	35	29	15	E/NE	NE/N	N/NE	SE/NE	N/NW	N/NE/NW
	4.7	5.3	9.1	5.3	6.4	8.8	28	18	12	22	17	9	EW/SW	NW/W	W/NW	SE/SW/NE	N/S/NW	SW/NW/W

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

JA: Jabalpur

PEN: Pendra Road

VA: Vadodara

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994.

2.3.4 Evaporation

The process of evaporation depends upon wind velocity, altitude, temperature and humidity. In summer, evaporation loss in the upper Zone of Narmada is between 6.0-10.0 mm/d. In Jabalpur region monitored at Jamtara, evaporation loss is considerably less i.e. between 4.0-7.0 mm/d. It is due to increase of humidity level by nearby Bargi Reservoir. Evaporation loss immediately increases at Barmanghat (Narsinghpur region) where it is between 6.0-12.0 mm/d. In middle zone monitored at Hoshangabad, evaporation loss is also less and is between 4.0-7.0 mm/d. Tawa reservoir and Barna dam are nearer to this place. Evaporation loss is more in lower Zone of Narmada monitored at Rajghat near Barwani. It is between 12.0-28.0 mm/d. In winter, evaporation loss is less in upper and middle Zone of Narmada and is between 1.0-3.0 mm/d. In lower Zone, evaporation loss is between 6.0-9.0 mm/d in winter season.

2.3.5 Humidity

The relative humidity in basin varies between 92% and 27% in the morning and between 88% and 15% in evening, depending upon the season. The relative humidity is naturally maximum during the monsoon months and is around 80% to 90%. In the winter months of December and January, the relative humidity comes down to around 30%. The variation in relative humidity between upper, middle and lower sections of the basin is not very pronounced. The relative humidity at various IMD station representative of the Narmada Basin is given in **Table 2-9**.

Table 2-9 Relative Humidity Data for Narmada Basin

Month/	Relative Humidity in Morning (%)						Relative Humidity in Evening (%)					
Location	HO	PAC	KHN	JA	PEN	VA	HO	PAC	KHN	JA	PEN	VA
January	62	65	56	74	64	60	37	49	29	43	48	31
February	51	54	44	64	55	47	25	37	23	32	38	20
March	37	36	32	44	39	48	17	25	17	23	28	20
April	28	29	29	30	30	46	15	22	16	18	23	17
May	30	33	41	27	31	59	17	23	18	17	24	25
June	62	86	66	57	60	75	44	55	44	45	55	52
July	87	91	83	85	86	87	78	87	71	79	83	74
August	89	92	84	87	87	89	78	88	73	80	85	75
September	85	86	82	82	84	83	70	82	66	71	80	63
October	69	64	64	73	70	68	48	56	41	52	63	43
November	64	58	58	68	57	55	38	50	35	44	49	34
December	62	65	58	723	60	58	37	47	32	43	47	32
Annual Mean	61	62	58	64	60	65	42	52	39	46	52	41

HO: Hoshangabad

PAC: Pachmarhi

KHN: Khandwa

JA: Jabalpur

PEN: Pendra Road

VA: Vadodara

Source: Basin Sub-basin Inventory of Water Pollution- The Narmada Basin, CPCB, Delhi March 1994

2.4 Geology

About 270 million years ago, the continents existed in two large masses and India was a part of the southern continental mass commonly known as GondwanaLand. Between the two continents, a large sea, Tethys existed. Presently the Himalayas and the Tibetan Plateau have taken the position of the ancient TethyanSea. The GondwanaLand was intruded by few large marine transgressions. A deep gulf or sea existed along the Sindh-Beluchisthan and the Kutchh. At one time, a marine ravine penetrated the very centre of Peninsular India through a narrow inlet along the present valley of Narmada. During this time India was divided into two halves by narrow strips of marine transgressions and there was no land communication between the Peninsular and northern India.

Along the Narmada Valley, several patches of sediments have been deposited which contains ancient remains of animals. These fossils are similar to those found along the tracts of Tapi river. Such similarity probably suggests that even about 3 million years ago, Narmada and Tapi were confluent and the separate fate of these two rivers was decided by recent earth movements. The Bheraghat falls of Narmada, near Jabalpur, was probably created during one such movement which appears to be a recent one.

The geological sequence in the basin is presented in **Table 2-10.** The Archaean group of rocks in the Narmada basin is represented by the Chilpighat series. These rocks wedge in at the eastern end between the Vindhyans and granitic gneisses and expand in the Narmada valley in strips. The Dharwadian rocks consisting mainly of quartzites, feldspar grits, shales and slates with intercaliated traps occur in Balaghat, Chhindwara, Jabalpur districts of Narmada valley. In Jabalpur area, the series is distinguished by perfectly crystalline dolomatic limestone. The famous "marble rocks" of Jabalpur belong to this series.

Table 2-10 Geological Sequence in Narmada Basin

Major Groups	Dominant Rocks	Age in Million Years.
Recent Alluvium	Alluvium	2-3
Deccan trap	Basalt	60-135
Lametas	Limestone, Sandstone	135-150
Gondwanas	Sandstone, Volcanics	150-400
Vindhyans	Sandstone, Shales	600-4500
Bijawars	Quartsites, Sandstone	600-4500
Archaeans	Quartsites, Shales, Slates	600-4500

On the upturned edges of the Archaeans, the Cuddapahs were deposited and the Narmada Valley is represented by Bijawars. The Bijawars occur in series of out crops extending from Bundelkhand to the south of Narmada and has thickness of less than 240m at some places. These rocks are generally characterised by quartzites, sandstones and sometimes conglomerates. Bijawars are found in Dhar and Jabalpur

districts. In Jabalpur, however, Bijawars are represented by somewhat different rock assemblages like phyllites, mica, schists, calcitic and dolomatic marbles. There is, however, some controversy over the age of the rocks and some geologists feel that they are older than Cuddapahs and should be classified along with upper Archaeans i.e. Dharwadian rocks.

The Cuddapahs were succeeded by rocks of Vindhyan system after a time interval marked by earth movement and erosion. The Vindhyan rock characterised by Bhander Sandstones, shales, limestones and Ganurgarh shales are exposed in the north of Hoshangabad town and extends upto Bhopal. Between Dewas and Khandwa in Parnakheri, thick Vindyans are exposed along the banks of Narmada mainly characterised by Bhander group of rocks and unclassified upper Vindhyans.

After the deposition of Vindhyan rocks and their uplift, there was a great hiatus in the stratigraphical history of the peninsula. At the end of Palaeozoic era, a series of changes took place which were also responsible for the mountain building movements called the Hereynian or Variscan orogeny. Due to this movement, the continents separated to the present configuration. The deposits during this period are called Gondwana and is exposed in the south of Hoshangabad. Thick Gondwana sediments are also found near Jabalpur, Rewa, Pachmarhi etc. The Gondwana formation ended in Cretaceous era i.e. about 135 million years ago. The end of cretaceous was marked by enormous lava flows which spread over vast areas of central and eastern India. These lavas of basaltic composition are found in the Khandwa, Khargone, Dhar, Dhule areas till practically up to the lower Narmada region. The interesting geological episode in the Narmada valley are the Lameta beds, which occur in Lameta ghats near Jabalpur The Lameta beds represents the fluviatile or esturine deposits just below the trap basalts.The mouth of the Narmada witnesses thick sedimentary deposits of recent age. These sediments are often saline but otherwise supports bumper crops.

2.5 Soils

Although no detailed soil survey has been carried out in the basin, periodically some soil surveys have been carried out in different parts of the basin under different schemes and for different purposes. In 1950, the Central Water Commission conducted soil surveys in the command areas of various projects and produced some maps on a 1:2,50,000 scale. Some of the projects covered are give in **Table 2-11**.

Table 2-11 Soil Surveys carried out by the Central Water Commission in Various Projects in Narmada Basin

S.No.	Project	Districts	Area in lakh ha.
1	Tawa	Hoshangabad	3.70
2	Bargi	Jabalpur, Narsinghpur	3.60
3	Kolar	Sehore	0.75
4	Punasa	Khandwa, Khargone	0.60
5	Barwah	Khargone, Dhar	1.60

As per the demand of Narmada Water Disputes Tribunal, a reconnaissance survey of the Narmada Sagar command area was taken up in 1975. Nearly 256 soil profiles were studied. Again during 1982-83, an area of about 2.8 lakh ha, falling within the Khandwa and Khargone districts, was surveyed by the department of Agriculture, MP to appraise the land irrigability in connection with project. Aerial photo surveys were carried out, and 366 profiles and 2,780 auger bores were examined.

The soil map of the area is given in **Figure 2-7.**In the upper basin, the majority of the soil are characterised by shallow black soils. These soils are erosional products of trap basalts. The black soils are rich in smeclite clays having a high water holding capacity. These clay lattices expand when they absorb water and thus reduce the water drainage. The organic matter is generally less than 5% in black soils. The black soil in the upper basin is generally in-situ kor collovial. These soils are often inter spread with red sandy or laterite soils. The profile is generally shallow and mainly covers the hilltops and plateau regions. The red soils are the result of intense chemical leaching of basalts whereby all the minerals in the rock are leached out except the oxides of silica, iron and aluminium. Due to intense leaching, these soils have a reasonably good drainage but lacking in nutrients essential for plant growth.

The soils in the Vindhyan and Satpura plateau region of the middle basin range from shallow black soils to medium black soils. Around Hoshangabad, recent alluviums with varied thickness can be witnessed. These soils are extremely fertile and supports cotton, Jawar and wheat.

In the lower part of the basin, the major soils of the valley and southern plateau are medium deep black soils. On the other hand mixed red and black soils occur in the northern plateau. In the mouth of the Narmada, Pliocene rocks along with recent alluviums are seen. These alluvial soils are mostly sandy looms with good drainage. They are extremely fertile and support good crops.

2.6 Minerals

The minerals found in the basin are bauxite, clay, coal, dolomite, graphite, iron ore, manganese, talc, limestone etc.The mineral map of Narmada Basin is given in **Figure 2-8**.

2.7 Ground Water

The occurrence of ground water generally depends upon the rainfall, drainage, topography and the geological conditions of the area. The ground water in upper, middle and lower basin occurs in distinct horizons with characteristic aquifers.

In the upper basin, the geological formation is mainly the older rocks belonging to the Archaeans and Vindhyans and are characterised by good water potential. The ground water within part of the basin occurs mainly in the weathered zones of the rocks. The quality and quantity of the ground water is reasonably good.

In the middle part of the basin where Gondwana rocks are predominant, the ground water occurs in varied quantities in the pores of sandstones. The occurrence mainly depends on the grain size of the rocks. In the coarse grained rocks, the ground water availability is substantial. However, in the sections of the basin where the trap rocks are exposed, the ground water conditions are rather erratic. In the trap basalts, ground water occurs in patchy aquifers and often these aquifers are not interconnected.

A significant part of the lower basin is occupied by trap basalts where the ground water occurs in patchy aquifers. However, near the mouth of the river, the coastal alluvials are predominant. The coastal alluvials contain highly permeable aquifers with good quantities of water. Their yield is generally excellent, with good recharge characteristics. The ground water in this area occurs mainly in unconfined aquifers with varying depths. However, ground water in alluvials is susceptible to seasonal water table fluctuations. In thickly populated areas, these aquifers are often contaminated.

Table 2-12 gives the ground water recharge and draft characteristics. The data suggests that the average ground water utilisation in the Narmada basin is about 45%. The draft in Sehore, Khandwa, Damoh, Dhar, Dewas, Raisen, Sagar, and Khargone is above 50%. In fact, these districts account for major ground water draft in the basin. In the rest of the area, the ground water remains under-utilised, and there is scope for further ground water development.

Table 2-12 Ground Water Recharge and Draft Characteristics in the Districts of Narmada Basin

Sl. No.	District	Net Ground Water availability (ham)	Total Annual Ground Water Draft (ham)	Net Ground Water availability for Future Irrigation (ham)
1	Sehore	77172	57394	18664
2	Hoshangabad	201888	35617	164889
3	Rajnandagaon	1123.84	50.1	1073.74
4	Shahdol	63909	4083	59067
5	Mandla	53779	8205	44658
6	Chhindwara	138594	71239	65615
7	Balaghat	91248	13361	77083
8	Betul	113970	53622	59227
9	Khandwa	76949	47583	27417
10	Raisen	75209	38165	35863
11	Sagar	112807	66079	44859
12	Damoh	36385	22000	13305
13	Dhar	97163	80451	15212
14	Seoni	79239	20456	57784
15	Khargone	77219	55848	19999
16	Dewas	79141	63383	14849
17	Jhabua	20134	9305	10051

Source:Dynamic Ground Water Resources of Madhya Pradesh (As on March 2009) published by State Ground Water Survey and Central Ground Water Board North Central Region, February 2012

2.8 Description of Water Storage / Diversion Projects

A Master Plan of the Narmada basin has been prepared for the development of water resources of the Narmada basin. The Master Plan envisages the construction of 30 major dams, 135 medium dams and 3000 minor dams to irrigate about 46.3 lakh ha of land in Madhya Pradesh (27.55 lakh ha), Gujarat (18 lakh ha), and Rajasthan (0.75 lakh ha). The major and important medium projects are listed in **Table 2-13** and **Table 2-14** respectively. **Figure 2-2** gives location of important projects along with their utilisation (withdrawls).

At present, there are four major hydroelectric cum irrigation project namely *Bargi, Indira Sagar, Omkareshwar & Sardar Sarovar* Projects on main Narmada river which are almost completed and eight completed projects on different tributaries namely Matiyari, Barna, Tawa, Kolar, Sukta, Man, Jobat and Karjan. The salient features of these projects are given below:

PROJECTS ON MAIN RIVER

Rani Awanti Bai Sagar Project (Bargi): This project is located on the main river Narmada near Jabalpur. The project was constructed at a cost of Rs 98,361 lakh. It is a multipurpose project. The total catchment area of the project is 14,556 Sq km. The gross and dead storage of the reservoir is 3920 hm^3 and 740 hm^3 respectively. The 135.00 km length of left bank canal of this project irrigate 1.92 lakh ha. This project has 2 units of 45 MW each on its left bank and other 2 units of 7.5 MW each on right bank. The project was initially started during the year 1985 and Head Works were completed in the year 1987.

Indira Sagar Project: The Indira Sagar Project is a multipurpose river valley project across river Narmada in Khandwa Distt. of Madhya Pradesh at a distance of 200 km from Bhopal. It has a CCA of 1,69,000 ha at 138% intensity on the left bank of Narmada river and generate 1000 MW of hydropower. The project also envisage supply of 74 MCM of drinking water to rural areas. The revised cost of the project at 1998 price level is Rs. 5150 crores.

Omkareshwar Project: The Omkareshwar multipurpose project is constructed across river Narmada near village Mandhata of Khandwa distt. in Madhya Pradesh. The dam site is located at a distance of 77 km from Indore. The project envisage construction of 73 m high concrete dam with a gated spillway to irrigate 1,46,800 ha CCA and to generate 520 MW power. The estimated cost of project is Rs. 1846.77 crores as in 2001.

Sardar Sarovar Project: The Sardar Sarovar dam is constructed across river Narmada and is located at 170 km U/S from Gulf of Khambat in Gujarat State. It is 1210 m long and 129.5 m high dam from river bed level. SSP proposes to irrigate a command area of 1.8 million ha of Gujarat and Rajasthan States and have an installed power generation capacity of 1450 MW. The project also provide the domestic water supply to 2.35 million people of Gujarat state. Almost 90% of the work at dam site has been completed. The revised estimated cost for the project was Rs. 39240.44 crores as in 2008-09 P.L.

Table 2-13 Major Projects (Completed, On-going & Proposed) in Narmada Basin

Sl. No	Name of Project	River	Status	Capacity Gross/ Live (hm^3)	Utilisation (hm^3)
1	Karjan	Karjan	Completed	630	NA
2	Sardar Sarovar	Narmada	Completed *		7475.4
3	Jobat	Hathni	Completed *	77.84/70.04	47.77
4	Lower Goi	Goi	Ongoing	-	-
5	Man	Man	Completed *	145.03/126.87	114.43
6	Upper Beda	Beda	Ongoing	91.82/76.24	7.58

Sl. No	Name of Project	River	Status	Capacity Gross/ Live (hm^3)	Utilisation (hm^3)
7	Maheshwar	Narmada	Ongoing	-	-
8	Omkareshwar	Narmada	Completed *	987/299	-
9	Indira Sagar	Narmada	Completed *	12220/9750	354.11
10	Sukta	Sukta	Completed	89.5/78.05	76.21
11	Ganjal	Ganjal	Proposed	-	-
12	Morand	Morand	Proposed	-	-
13	Kolar	Kolar	Completed	270/265	209.29
14	Tawa	Tawa	Completed	2310/2050.5	1673.49
15	Barna	Barna	Completed	539/455.78	372.79
16	Dudhi	Dudhi	Proposed	-	-
17	Sitareva	Sitareva	Proposed	-	-
18	Sakkar	Sakkar	Proposed	-	-
19	Machreva	Machreva	Proposed	-	-
20	Sher	Sher	Proposed	-	-
21	Chinki	Narmada	Proposed	-	-
22	Ataria	Hiran	Proposed	-	-
23	Rani Awanti Bai Sagar (Bargi)	Narmada	Completed	3920/3180	335.8
24	Matiyari	Matiyari	Completed	56.8/51.12	17.4
25	Basania	Narmada	Proposed	-	-
26	Halon	Halon	Proposed	-	-
27	Upper Burner	Burner	Proposed	-	-
28	Roosira	Narmada	Proposed	-	-
29	Raghavpur	Narmada	Proposed	-	-
30	Upper Narmada	Narmada	Proposed	-	-

* : Though the Head work in project(s) is(are) complete, Fully Designed irrigation potential is yet to be developed. As the reservoir is ready, the projects are stated as complete for water year book purpose.

Source: Annual Water Account of Narmada Basin up to Sardar Sarovar Dam site, Water Year 2011-12, Published by NCA.

PROJECTS ON TRIBUTARIES

Matiyari Project: This project is located on river Matiyari, a sub-tributary of Narmada near village Simariya in Mandla District. The project is constructed at a cost of Rs. 1558.40 lakh. It is mainly an irrigation project. The total catchment area of the project is 158.75 sq km. The gross and dead storage of the reservoir is 58.80 hm^3 and 5.68 hm^3 respectively. About 10120 ha of land is being irrigated through 78 km length of canal.

Barna Project: This project is located on river Barna, a tributary of river Narmada about 20 km from Bareli in Raisen District. The project is constructed at a cost of Rs. 153.7 lakh. It is mainly an irrigation project. The total catchment area of the project is 1,176 sq km. The gross and dead storage of the reservoir are 538.3 hm^3 and 83.15 hm^3 respectively. About 54,915 ha of land is being irrigated through 39.05 km length of canal. The project was commissioned during 1973.

Tawa Project: This project is located on river Tawa, a tributary of river Narmada, 9 km from Bagra Tawa railway station in Hoshangabad District. The project is constructed at a cost of Rs. 9,142 lakh. It is mainly an irrigation project. The total catchment area of the project is 5,983 km^2. The gross and dead storage of the reservoir is 2,248.8 hm^3 and 255.6 hm^3 respectively. About 2.47 lakh ha of land is being irrigated through 187 km length of canal. The project was commissioned during 1977.

Kolar Project: This project is located on river Kolar a tributary of river Narmada near village Lavakhedi (Birpur) about 32 km southwest of Bhopal. The estimated cost of the project is Rs 139.14 Crore as approved by TAC. Catchment area up to the dam site is 508 sq km. GCA, CCA and annual irrigation of the project are 62,752 ha, 45,087 ha and 60,868 ha respectively. In addition to irrigational facilities, the project also provides 56.75 hm^3 (34 MGD) drinking water to the Bhopal city. Gross and live storage capacities of the project are 270 hm^3 and 265 hm^3 respectively.

Sukta Project: This project is located on river Sukta, a tributary of river Narmada near village Khirala about 40 km from Khandwa (in Khandwa District). The project is constructed at a cost of Rs. 1,189.65 lakh. It is mainly irrigation cum domestic water supply project. The total catchment area of the project is 469 sq km. The gross and dead storage of reservoir is 96.85 hm^3 and 11.30 hm^3 respectively. About 16,599 ha of land is being irrigated through 23.48 km length of canal. The project was commissioned during 1980 and finally completed during 1984.

Man Project: Man Irrigation Project in Dhar Distt. of Madhya Pradesh envisage construction of a composite dam across river Man (a tributary of river Narmada) near village Jeerabad of Gandhwani Tehsil. It is located on Dhar – Manawar state highway at a distance of 60 km from Dhar and 320 km from Bhopal. The project has partially lined canal system taking off from both flanks of the dam to provide irrigation in a CCA of 15,000 ha with annual irrigation of 19,200 ha. The estimated cost of project was 176.75 crores in 2004.

Jobat Project: Jobat irrigation project in Madhya Pradesh envisage construction of a composite dam across river Hathni (a tributary of river Narmada) near village Waskal, 24 km away from Kukshi town and 400 km from Bhopal. A 29.73 km long main canal is proposed with distribution network to provide irrigation to 9,848 ha of CCA on the left bank of river Hathani to benefit 27 villages of Kukshi Tehsil in Dhar Distt. Work pertains to Head works is completed in all respect and at an average 90% work pertains to canal system is also completed.

Karjan Project: This project is located on river Karjan a tributary of river Narmada near village Jitgadh in district Bharuch (Rajpipla narrow gauge Railway station is 10 km from dam site). The project is constructed at a cost of Rs. 13,861.3 lakh. It is a major irrigation project. The catchment area of the project is 1,403.78 sq km. The gross and dead storage of the reservoir is 630.0 hm^3 and 49.0 hm^3 respectively. About 56,200 ha of land is being irrigated through 63.605 km length of canal. The project was commissioned during June 1987.

Table 2-14 Medium Projects in Narmada Basin (Completed & On-going & Proposed)

Sl. No.	Name of project	River/Tributary	Status	Capacity Gross/Live (hm^3)	Utilisation (hm^3)
1	Jalgaon	Banjar/Local Nalla	Completed	2.33/2.17	1.69
2	Banjar	Banjar/Gahra Nalla	Completed	14.76/13.71	5.72
3	Bohribund tank	Bhuta Nalla/Hiran	Completed	36.93/34.47	54.24
4	Bichhia tank	Kolar Nalla/Banjar	-do-	7.87/7.23	6.37
5	Dhuandhar tank	Dhuandhar Nalla/Banjar	-do-	5.26/5.11	4.62
6	Mehgaontola tank	Bidri Nalla/Gour	-do-	11.62/10.51	5.02
7	Barnoo tank	Barnoo Nalla	-do-	10.32/8.96	6.39
8	Madai tank	Madai Nall	-do-	8.70/8.39	6.32
9	Pariyat tank	Pariyat Nalla	-do-	20.30/18.47	19.33
10	Dukrikheda tank	Ghogra Nalla/ Sukhri	-do-	12.25/11.50	6.18
11	Chandra Keshar tank	Chandra Keshar	-do-	31.65/30.06	19.33
12	Paras tank	Paras	-do-	7.53/6.10	6.09
13	Sampna tank	Sampna	-do-	16.92/14.32	14.31
14	Upper Beda	Beda	Ongoing	91.82/76.24	-
15	Choral Nakheri tank (Choral)	Choral Nakheri	-do-	23.92/19.23	38.42
16	Choral Nakheri tank (Nakheri)	Choral Nakheri	-do-	Feeder Tank	-
17	Segwal tank	Sazar Nalla/Borad	Completed	8.96/8.62	8.12
18	Satak tank	Satak	Completed	19.79/18.37	16.23
19	Dejla Dewada tank	Kundi	Completed	56.35/50.29	50.29
20	Kunda tank	Buti Nalla	Completed	8.50/8.10	8.10
21	Sukalda tank	Chiri & Khug Nalla	Completed	15.56/12.69	11.68

Source: Annual Water Account of Narmada Basin up to Sardar Sarovar Dam site, Water Year 2011-12, Published by NCA.

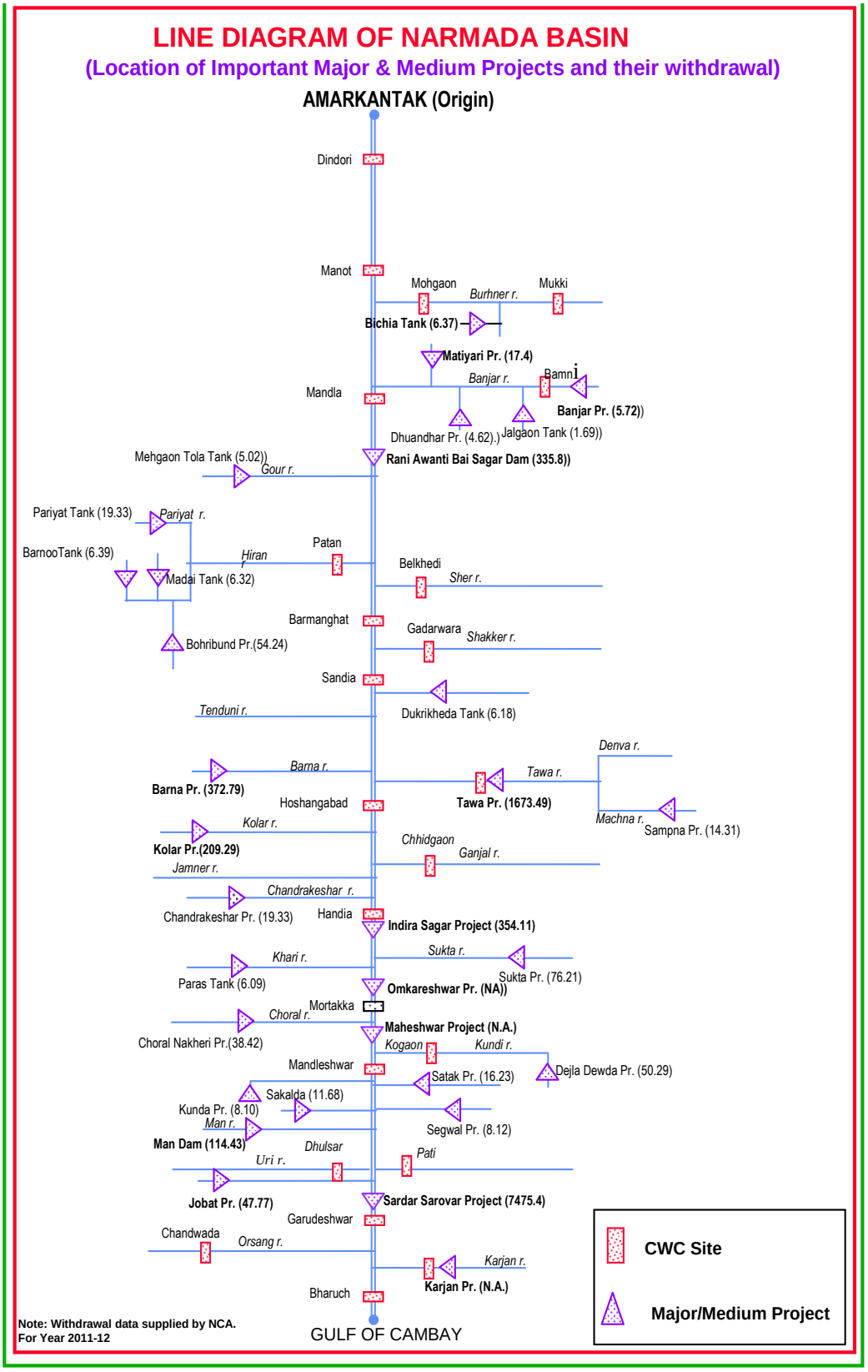


Figure 2-2 Line Diagram of Narmada Basin (Location of Major & Medium Projects and their Withdrawal)

Note: Withdrawal in case of Bargi, I.S.P., O.S.P & S.S.P consists of utilisation for irrigation through canals in addition to spillway/power house release. Figure in the bracket against the project shows the Withdrawal from project in MCM

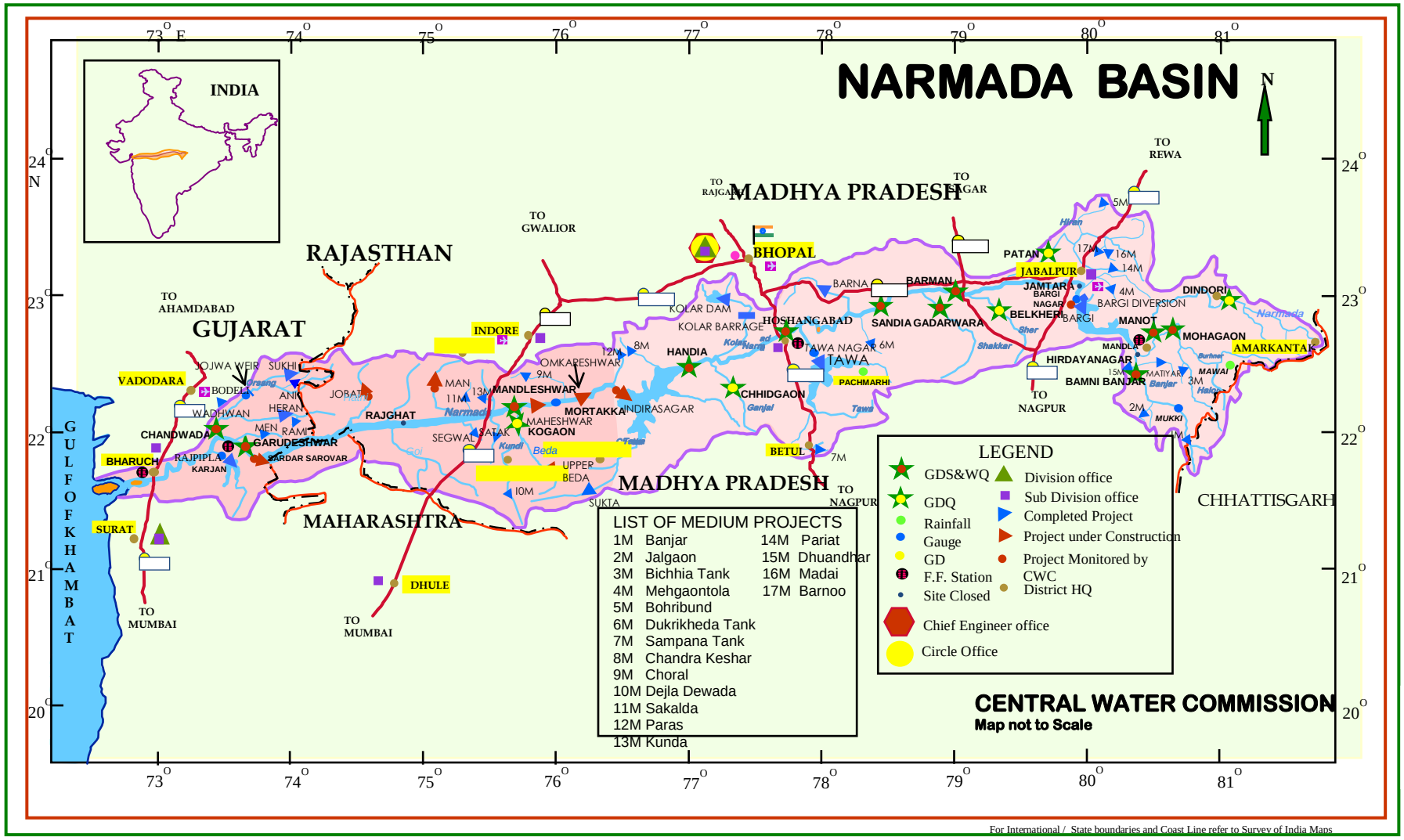


Figure 2-3 Narmada Basin

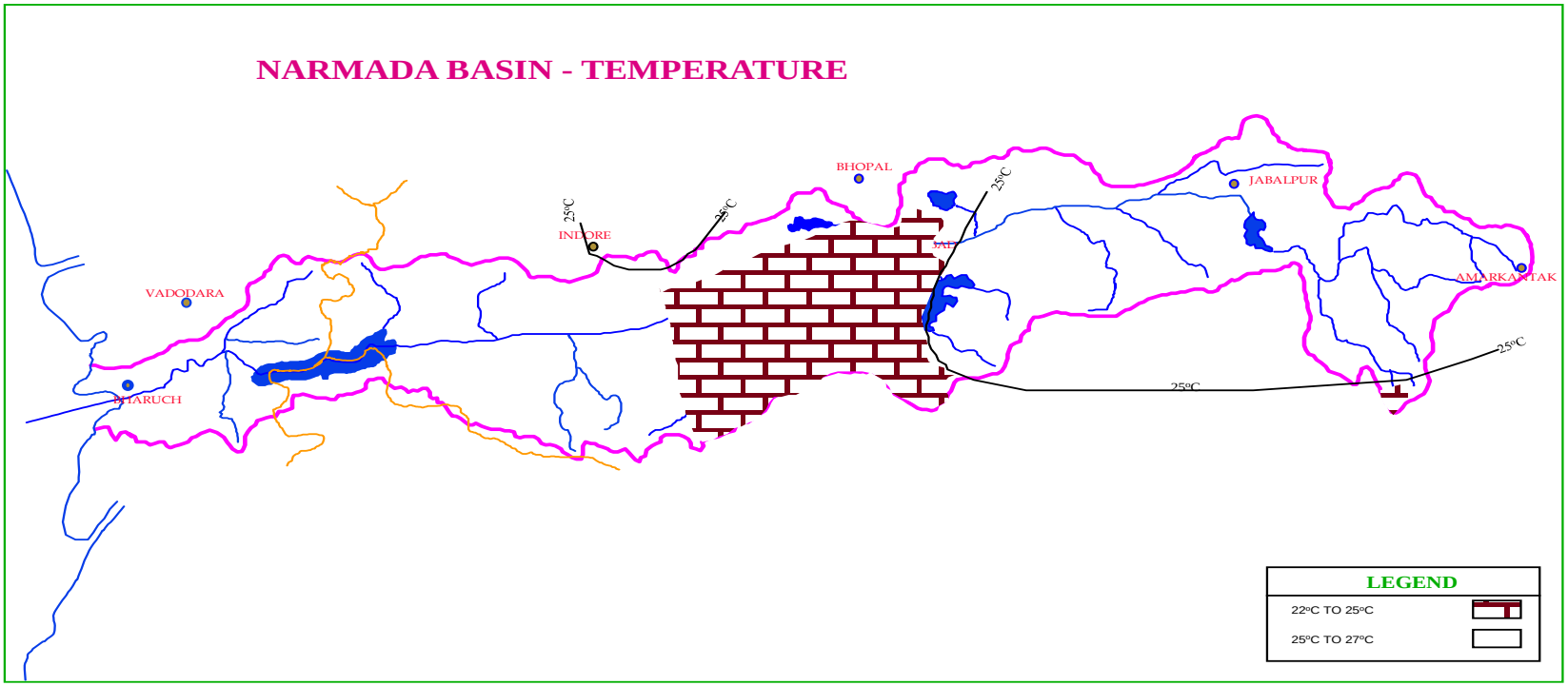


Figure 2-4 Narmada Basin - Temperature

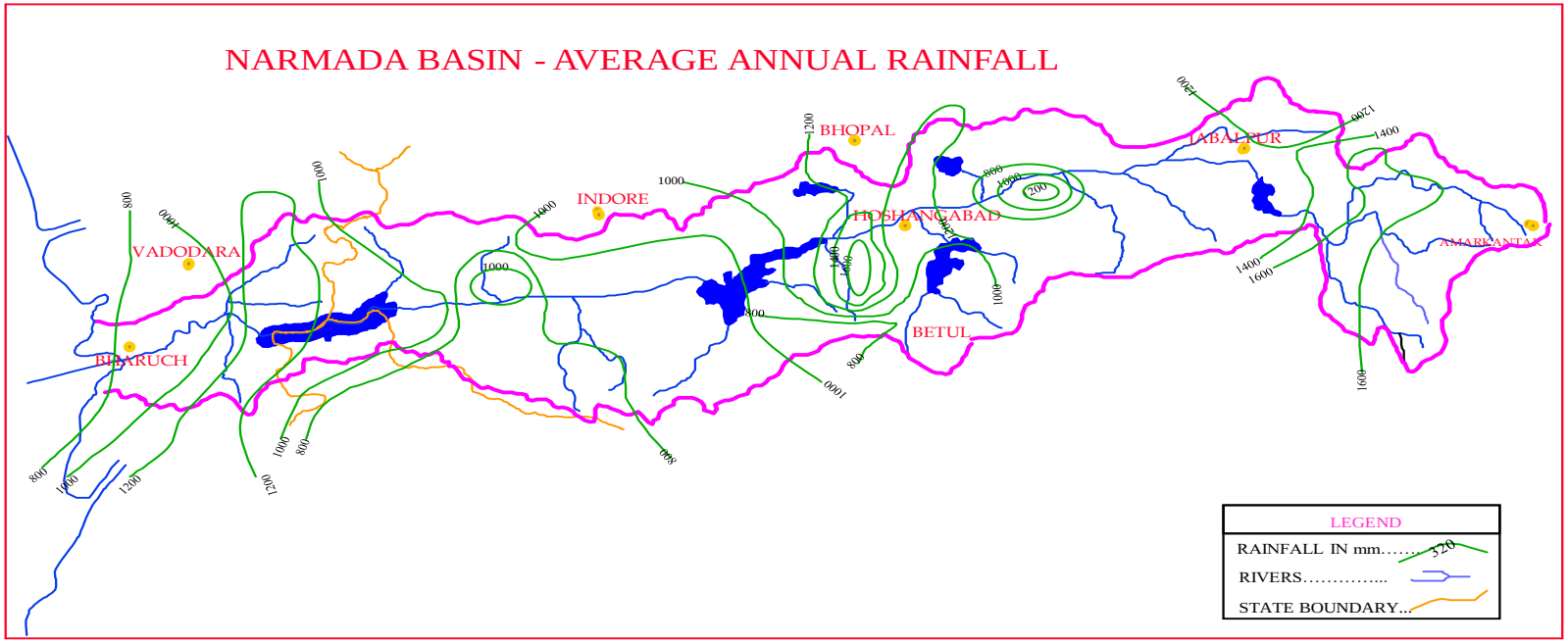


Figure 2-5 Narmada Basin – Average Annual Rainfall

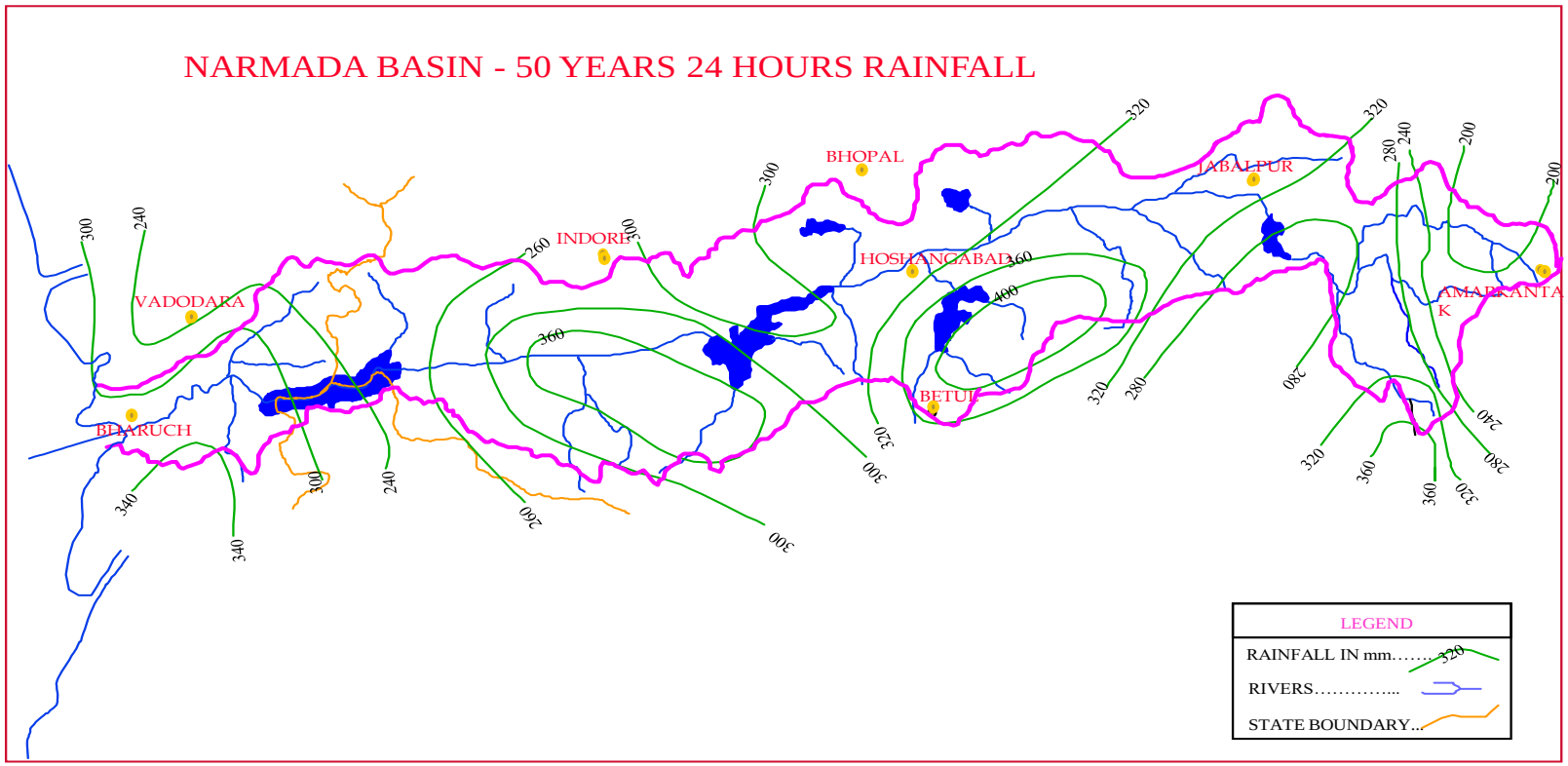


Figure 2-6 Narmada Basin – 50 Years 24 Hours Rainfall

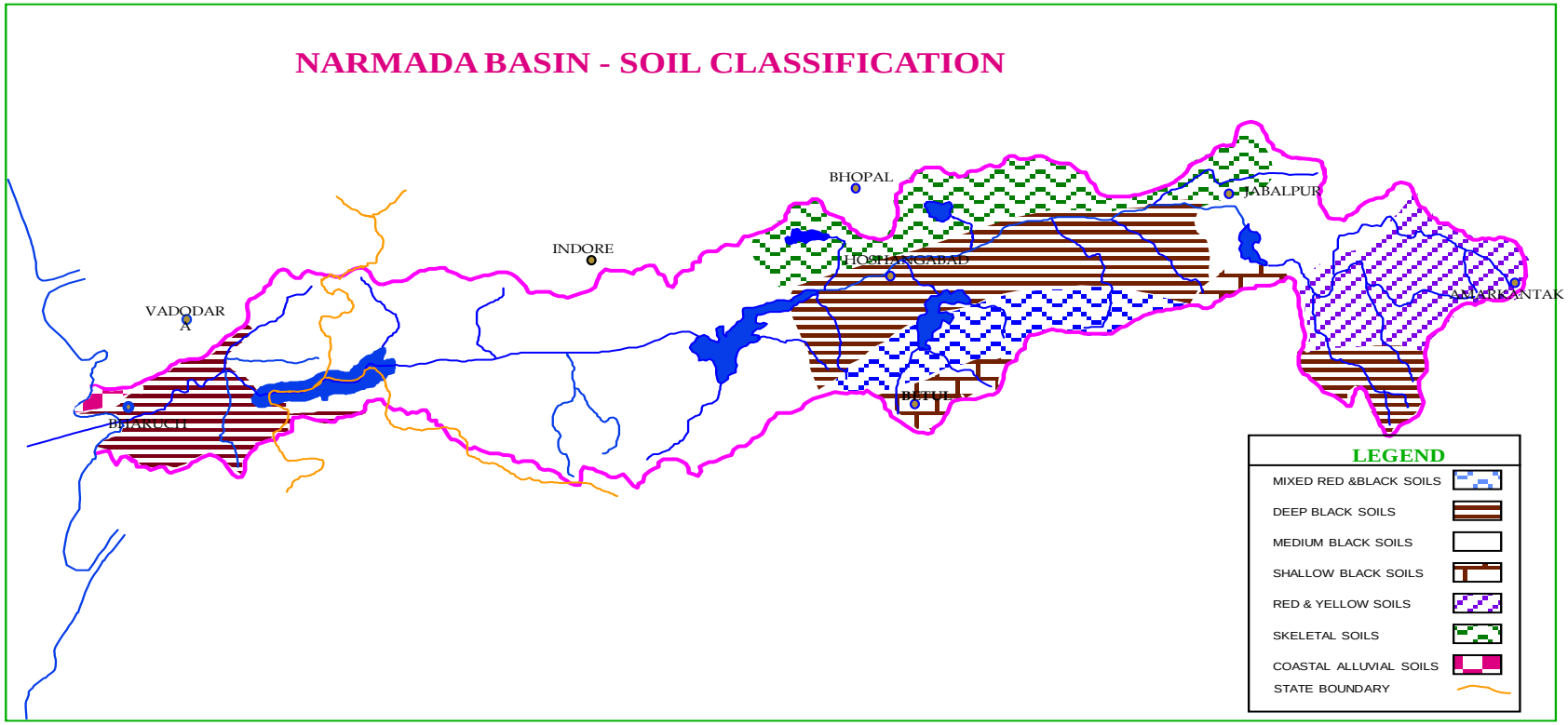


Figure 2-7 Narmada Basin – Soil Classification

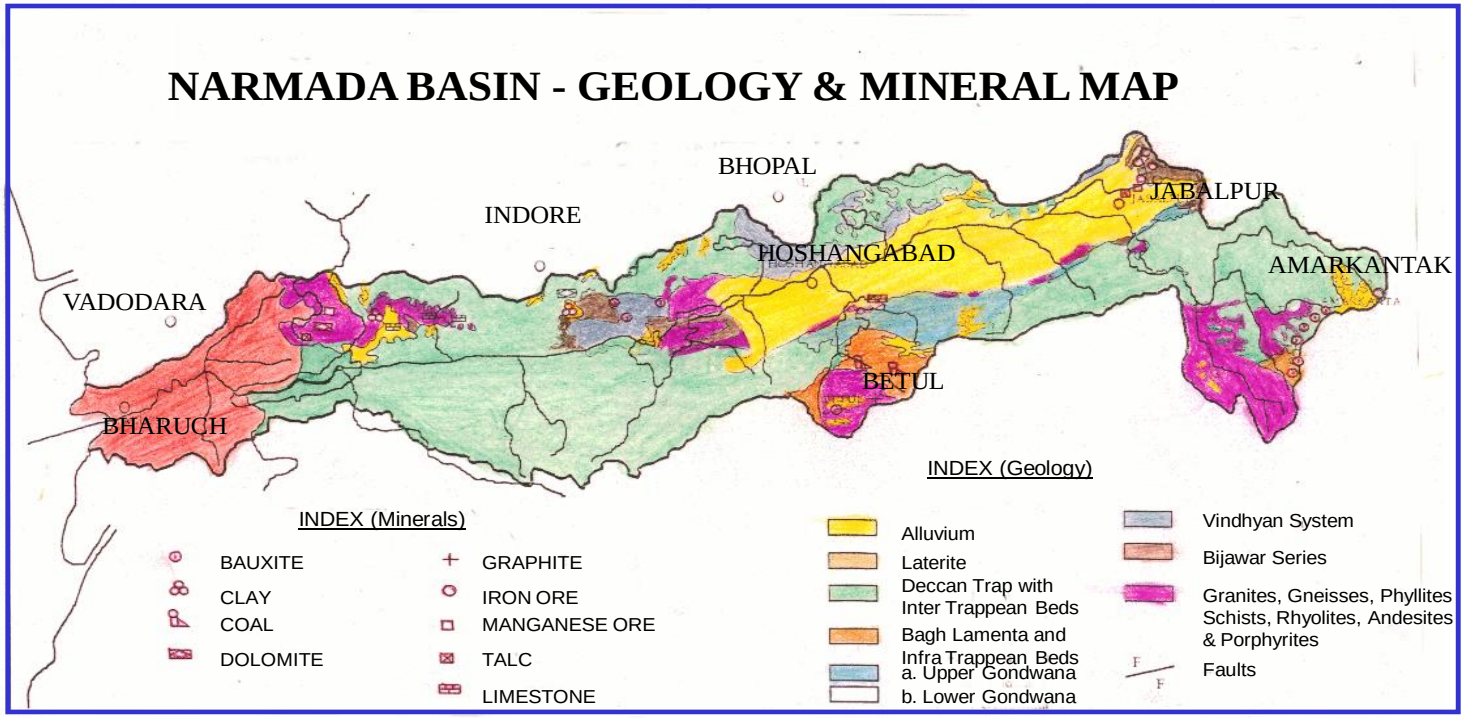


Figure 2-8 Narmada Basin – Geology & Mineral Map

3 Stream Flow Data

3.1 Methodology

3.1.1 Gauge Measurement

Water level or stage of river is measured as its elevation above the G.T.S. datum. Water level measurement is conducted by reading non-recording gauges as specified in IS 4080-1967. Series of vertical staff gauges have been fixed at three sections at every site. The gauge posts are generally of wood or concrete with cut and ease water arrangement and fixed securely in vertical position by anchoring them in M-15 concrete base of suitable size. Enamelled vertical gauge plates with metric markings are fixed on the gauge posts so that the gauges can be read up to 0.005 m.

Out of the three gauge lines the Central one is used as Station Gauge line and the readings of other two gauge lines are used for calculation of water surface slope. During non-monsoon season, gauges are read thrice daily (0800, 1300 and 1800 hrs) and during monsoon, gauges are read hourly at the station gauge line.

3.1.2 Discharge Observations

Discharge is observed once a day starting from 0800 hrs at all the sites by area velocity method except on Sundays and holidays. For non-observation days, the discharge values are computed from the Stage and Discharge relation prepared from the observed data for the water year 2018-19.

The stream width is divided into 15 to 25 segments based on the degree of accuracy as outlined in IS 1192-1981. The width of the river is measured by steel tape/ metallic tape or wire/nylon rope stretched across the river with markings indicated there on, when the river width and depth permitted wading. For large width and deep flow conditions segmentation is done using simple trigonometric method for which pivot point and segment blocks have been constructed at each site.

The depth is measured by using sounding rod 3 to 6 metre long adopting specifications given in IS 3912-1966. When the river flow is very deep and swift, lead lines/ echo sounders are used. Necessary Airline correction and Wet line corrections are made to the sounding observation as provided in IS 1192-1981. The velocity is measured as per IS 3918-1966 by using a cup type current meter conforming to specifications given in IS 3910-1966. The current meter is lowered at the requisite depth (0.6d) vertically at every segment by suspension arrangement as specified in IS 6064-1971. In high velocities, boats fitted with power engines or motor launches are used. Drift is measured and correction for the same is made. Where observations by boat or launch are not possible, measurement of velocity is conducted from bridge or cableway.

When the above procedures are not possible then velocity is measured by float observations. The observations are recorded in a standard format for calculation of total river flow.

3.2 Data Availability

Data availability at various sites in Narmada basin is given in **Table 3-1**.

Table 3-1 Data Availability at CWC Sites

Sl. No.	Station Name	Type	Data Available		Station code No.
			From (Year)	To (Year)	
1	Narmada at Dindori	G/D/Q	88/88/90	2018	01 02 15 001
2	Narmada at Manot	G/D/S/Q	76/76/79/80	2018	01 02 15 002
3	Narmada at Aamgaon	G/D	99/01	2006	NCA
3	Burhner at Mohgaon	G/D/S/Q	77/77/92/86	2018	01 02 15 004
4	Banjar at Bamni	G/D	99/99	2018	-
5	Banjar at Mukki	G	88	2018	01 02 15 005
6	Banjar at Hirdayanagar	G/D/S/Q	76/76/92/86	2002	01 02 15 006
7	Narmada at Mandla	G	75	2018	01 02 15 007
8	Narmada at Jamtara	G/D/S/Q	71/72/72/79	2001	01 02 15 008
9	Hiran at Patan	G/D/Q	79/79/86	2018	01 02 15 009
10	Sher at Belkheri	G/D/Q	77/77/86	2018	01 02 15 010
11	Narmada at Barmanghat	G/D/S/Q	70/71/72/79	2018	01 02 15 011
12	Shakkar at Gadarwara	GDSQ	77/77/78/79	2018	01 02 15 012
13	Narmada at Sandia	G/D/S/Q/R	78/78/78/79	2018	01 02 15 013
14	Tendoni at Maheshwar	G/D	84/84	1993	01 02 15 014
15	Barna at Bareli	G/D	84/84	1993	01 02 15 015
16	Tawa at Tawa Dam	G	74	2018	01 02 15 017
17	Tawa at Manegaon	G/D/Q	76 /76/76	1991	01 02 15 018
18	Tawa at Tawakati	G/D	99/01	2006	NCA
19	Machna at Shahpur	G/D	99/00	2006	NCA
20	Narmada at Hoshangabad	G/D/S/Q	72/72/72/79	2018	01 02 15 019
21	Ganjal at Chhidgaon	G/D/Q	76/76/86	2018	01 02 15 020
22	Jamner at Sandalpur	G/D	87/87	1993	01 02 15 021
23	Narmada at Handia	G/D/S/Q	77/77/77/79	2018	01 02 15 022

Sl. No.	Station Name	Type	Data Available		Station code No.
			From (Year)	To (Year)	
24	Chhota tawa at Ginnore	G/D/Q	71/71/72/79	1999	01 02 15 023
25	Narmada at Mortakka	G/D/Q	99/99/99	2015/2007/2007	01 02 15 024
26	Kundi at Kogaon	G/D/Q	78/78/86	2018	01 02 15 025
27	Narmada at Mandleshwar	G/D/S/Q	70/71/72/79	2018	01 02 15 026
28	Man at Ajandiman	G/D	84/84	1993	01 02 15 027
29	Narmada at Rajghat	G/D/S/Q	71/72/72/79	2007	01 02 15 028
30	Uri at Dhulsar	G/D	99/99	2017	NCA
31	Goi at Pati	G/D	99/99	2017	NCA
32	Hathni at Jobat	G/D	2000	2006	NCA
33	Hathni at Tikola	G/D	84/84	2002	01 02 15 029
34	Narmada at Garudeshwar	G/D/S/Q	71/72/73/77	2018	01 02 15 030
35	Orsang at Chandwada	G/D/S/Q	79/79/88/80	2018	01 02 15 032

3.2.1 Explanatory Notes

The explanatory notes given here under are designed to assist in the interpretation of hydrological parameters contained in the data presented. The notes are therefore applicable in so far as the data presented in this book.

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

2. Discharge is given in cubic metre per second.

3. Discharges given are actual observed/computed discharges.

4. The zero of gauge is datum level/R.L. fixed for a given site, which is kept 1 m 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.

5. Maximum and minimum discharges are taken from the daily observed flows.

6. Runoff in "mm" is the notional depth of water in millimetres over the catchment area equivalent to annual runoff calculated at the discharge measurement station. It is computed using the relation.

$$Runoff\ (mm) = \frac{Annual\ flow\ (hm^3)}{Catchment\ area\ (km^2)}\ X\ 100$$

7. Peak and lowest flow correspond to the highest and lowest water levels recorded during the period of record.

8. Measuring authority refers to the field Division responsible for the operation of the gauging station.

9. The gauging station code number is a unique nine column numeric reference number which facilitates storage and retrieval of flow data in data banks. The first two columns are identifier of measuring authority. Third and fourth columns are for zone/basin. Fifth and sixth columns are for independent river and last three i.e. seventh, eighth and ninth columns are for station numbers.

10. The month and the year from which data are available in the data bank is indicated in **Table 3-1**. .

3.2.2 Method of Presentation

The data presented in this book are processed discharge data obtained from application of SWDES and e-SWIS.

In the following pages, station wise hydrological data are presented comprising history sheet, daily flow table and pictorial summary. The sequence of hydrological stations is arranged from its origin to its outfall giving inter-priority to an intermediate tributary station in a similar fashion.

History sheets give concise description of the hydrological station. The flow tables present daily observed flows together with 10 daily, monthly and annual summaries. The pictorial summary shows monthly hydrograph of the current year for each individual gauging station which is superimposed on the corresponding maximum, minimum and mean values for the period of record i.e. up to the previous year. Thus maximum represents monthly maximum average discharge, minimum represents monthly minimum average discharge and mean represents mean of the 10 daily average discharges for the period of past record. The period of data considered is from inception of the site to the previous water year. Flow below 0.1 cumec is not represented in the pictorial summary because log scale has been used for plotting hydrographs.

The hydrological data presented here mainly consists of the following :

1 **History sheet**: It mainly consists of some salient features of the particular site as its location ,its drainage area, tributary, opening dates and the maximum and minimum discharge values and their corresponding water levels with the exact dates of their occurrence.

2 **Stage discharge curve**: It gives a relationship between the stage of the river at agiven time and the coresponding discharge.

3 **Stage discharge sheet**: It consists of the stage-dischargedata (both observed and that calculated from the stage discharge curve) for all the days of the current water year, peak observed and computed discharge, lowest observed discharge and the total runoff for the current water year.

4 **Histogram hydrograph**: It is a discharge –time graph which shows the mean monthly discharge based on the historical data ,mean monthly discharge for the current water year, minimum and maximum discharge base on the historical data.

5 **Annual Runoff**: It gives the values of the annual runoff (in MCM) for all the years from the opening of the site upto the current year.

6 **Monthly Average Runoff:** This chart shows the monthwise distribution of runoff based on the historical data of the site.

7 **Monthly Runoff:** This chart shows the monthwise distribution of runoff for the current water year.

8 **Pre-Monsoon & Post-Monsoon X-Section for Water Year :** It gives the pre-monsoon & post-monsoon cross sectional profile of the river ,maximum and minimum water levels occurred during the current year with the date of their occurrence.

9 **Water Level vs. Time - Graph** of Highest Flood Peak during the current Year

10 **Water Level vs. Time - Graph** of 2nd Highest Flood Peak during the current Year

11 **Water Level vs. Time - Graph** of 3rd Highest Flood Peak during the current Year

4 Hydrological Data

In the following pages, station wise hydrological data are presented comprising history sheet, daily flow table and pictorial summary. The sequence of hydrological stations is arranged from its outfall to its origin giving inter-priority to an intermediate tributary station in a similar fashion. Data of following stations are given in the following pages

- **Orsang at Chandwada**
- **Narmada at Garudeshwar**
- **Narmada at Mandleshwar**
- **Kundi at Kogaon**
- **Narmada at Handia**
- **Ganjal at Chhidgaon**
- **Narmada at Hoshangabad**
- **Narmada at Sandia**
- **Shakkar at Gadarwara**
- **Narmada at Barmanghat**
- **Sher at Belkheri**
- **Hiran at Patan**
- **Banjar at Bamni**
- **Burhner at Mohgaon**
- **Narmada at Manot**
- **Narmada at Dindori**
- **Narmada at Bijora**

4.1 Orsang at Chandwada

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	CHANWADA	**Code**	:	006-TDSURAT
State	:	Gujarat	**District**	:	Vadodara
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Orsang	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Orsang
Division	:	Executive Engineer, Tapi Division, Surat	**Sub-Division**	:	Lower Narmada Sub-Division, Bharuch
Drainage Area	:	3846.0 Sq. Km.	**Bank**	:	
Latitude	:	22°3'0''	**Longitude**	:	73°27'55''
Current Zero of Gauge (m)	:	18			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
18.0	29/12/2016	-
18.0	03/06/2014	29/12/2016
18.0	10/01/1979	03/06/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1979-1980	63.6	21.785	22/11/1979	0	0	03/07/1979
1980-1981	1128	23.35	23/08/1980	0.1	20.02	28/01/1981
1981-1982	7824	29.2	10/08/1981	0.1	19.47	30/03/1982
1982-1983	1210.1	23.585	17/08/1982	0.1	19.55	07/06/1982
1983-1984	4080	27.6	18/08/1983	0.1	19.89	16/03/1984
1984-1985	5000	28.86	20/08/1984	0.1	19.945	10/03/1985
1985-1986	970	23.165	06/08/1985	0.1	20.02	04/10/1985
1986-1987	585	25.2	16/08/1986	0.1	20.058	23/07/1986
1987-1988	750	23.5	25/08/1987	0.02	20.145	01/08/1987
1988-1989	4650	27.2	04/08/1988	0.1	0	15/06/1988
1989-1990	4100	26.95	20/08/1989	0.05	0	31/10/1989
1990-1991	8900	33.45	24/08/1990	0	19.605	30/06/1990
1991-1992	1890	24.3	31/07/1991	0.05	19.57	10/07/1991
1992-1993	1600	24	07/09/1992	0.28	19.44	30/11/1992
1993-1994	2475	25.5	17/07/1993	0.01	19.285	09/11/1993
1994-1995	9070	33.55	07/09/1994	0.05	19.18	07/03/1995
1995-1996	1265	23.6	03/09/1995	0.1	19.29	06/11/1995
1996-1997	4600	29	27/07/1996	0	18.99	04/01/1997
1997-1998	4360	28.9	01/08/1997	0	18.92	08/02/1998
1998-1999	2600	30	16/09/1998	0	18.95	02/02/1999
1999-2000	1675	25.94	22/09/1999	0.03	18.63	04/09/1999
2000-2001	255	20.4	14/07/2000	0.01	18.8	31/08/2000
2001-2002	2790	23.8	05/08/2001	0.02	18.56	05/10/2001
2002-2003	2420	26.8	04/09/2002	0.01	18.64	29/10/2002
2003-2004	2050	25.5	25/06/2003	0.25	18.85	09/12/2003
2004-2005	4800	28.8	14/08/2004	0.36	18.65	03/07/2004
2005-2006	2379.72	23.2	04/07/2005	1.61	18.17	29/06/2005
2006-2007	6125.55	31.2	07/08/2006	0.92	18.655	03/07/2006
2007-2008	4085.92	27	02/07/2007	1.61	18.17	29/06/2007
2008-2009	2135.29	23.2	12/08/2008	1.27	18.43	25/07/2008
2009-2010	779.8	20.8	30/08/2009	0	18.28	04/11/2009
2010-2011	2068.97	23.35	05/08/2010	0	0	21/12/2010
2011-2012	979.68	22.325	09/08/2011	0	0	17/06/2011
2012-2013	2726.26	25	07/09/2012	0	0	22/06/2012
2013-2014	3665.13	26.8	24/09/2013	0.81	18.04	31/05/2014
2014-2015	1425.74	22.8	09/09/2014	0	0	25/06/2014
2015-2016	470.64	20.7	28/07/2015	0	0	04/02/2016
2016-2017	475.18	19.6	11/08/2016	0	18.01	03/01/2017
2017-2018	172.82	18.95	30/08/2017	0	0	01/06/2017

2018-2019	215.05	19.15	18/08/2018	1.19	35.63	22/10/2018

Stage Discharge Sheet for Orsang at Chandwada for the period 2018-19

Day	Jun		Jul		Aug		Sep		Oct	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	17.610		17.600		17.810	16.48	17.920	69.91	18.100	15.67
2	17.610		17.580		17.780	12.71	17.900		18.060	
3	17.610		17.550		17.750	11.92	17.960		18.020	14.02
4	17.610		17.550		17.740	9.480	17.850	62.82	17.980	7.572
5	17.600		17.550		17.720		17.900	70.24	17.940	7.173
6	17.600		17.550		17.750	7.680	17.850	61.15	17.900	7.537
7	17.600		17.550		17.740	6.690	17.800	56.72	17.870	
8	17.600		17.670		17.720	6.320	17.730	32.99	17.830	5.523
9	17.600		18.100	38.59	17.750	7.285	17.750		17.800	5.251
10	17.600		17.800	10.02	17.880	15.67	17.740	29.54	17.770	5.008
11	17.600		17.670		18.080	29.05	17.840	32.97	17.720	2.306
12	17.600		18.400	49.42	17.890		17.800	26.58	17.720	2.314
13	17.600		18.750	126.3	17.840	15.68	17.980		17.700	1.570
14	17.600		18.360	33.46	17.770	16.63	17.980	28.38	17.690	
15	17.600		18.290		17.740		18.030	17.22	17.690	1.411
16	17.600		18.580	35.86	17.710	9.386	18.000		17.670	1.280
17	17.590		18.440	35.09	17.900	17.14	17.940	12.69	17.670	1.280
18	17.590		18.050	26.23	19.200	218.7	17.900	11.35	17.670	1.277
19	17.590		17.860	12.99	18.600		17.860	9.866	17.670	
20	17.580		17.890	16.20	18.150	79.75	17.820	9.460	17.640	1.208
21	17.580		18.100	31.28	18.080	72.59	17.780		17.630	
22	17.580		18.280		19.480		17.730	8.728	17.630	1.165
23	17.580		18.060	28.00	18.500	179.6	17.730		17.620	
24	17.580		18.290	38.13	18.220	143.6	18.420	78.29	17.610	
25	17.580		18.600	132.9	18.150	78.07	18.210	58.62	17.620	
26	17.570		18.400	101.4	18.070		18.100	45.94	17.610	
27	17.580		18.100	32.45	18.020	79.07	18.070	43.36	17.610	
28	17.580		17.960	21.21	18.000	76.61	18.040	41.04	17.610	
29	17.580		17.900		17.940	65.17	17.990	23.89	17.610	
30	17.580		17.850	18.36	17.880	61.63	17.950		17.610	
31			17.830	16.89	17.930	71.28			17.610	
Ten-Daily Mean										
I Ten-Daily	17.604		17.650	24.31	17.764	10.47	17.840	54.77	17.927	8.470
II Ten-Daily	17.595		18.229	41.95	18.088	55.19	17.915	18.56	17.684	1.581
III Ten-Daily	17.579		18.125	46.73	18.206	91.96	18.002	42.84	17.615	1.165
Monthly										
Min.	17.570		17.550	10.02	17.710	6.320	17.730	8.728	17.610	1.165
Max.	17.610		18.750	132.9	19.480	218.7	18.420	78.29	18.100	15.67
Mean	17.593		18.005	42.36	18.025	52.33	17.919	37.81	17.738	4.798

Annual Runoff in MCM = 261 Annual Runoff in mm = 68

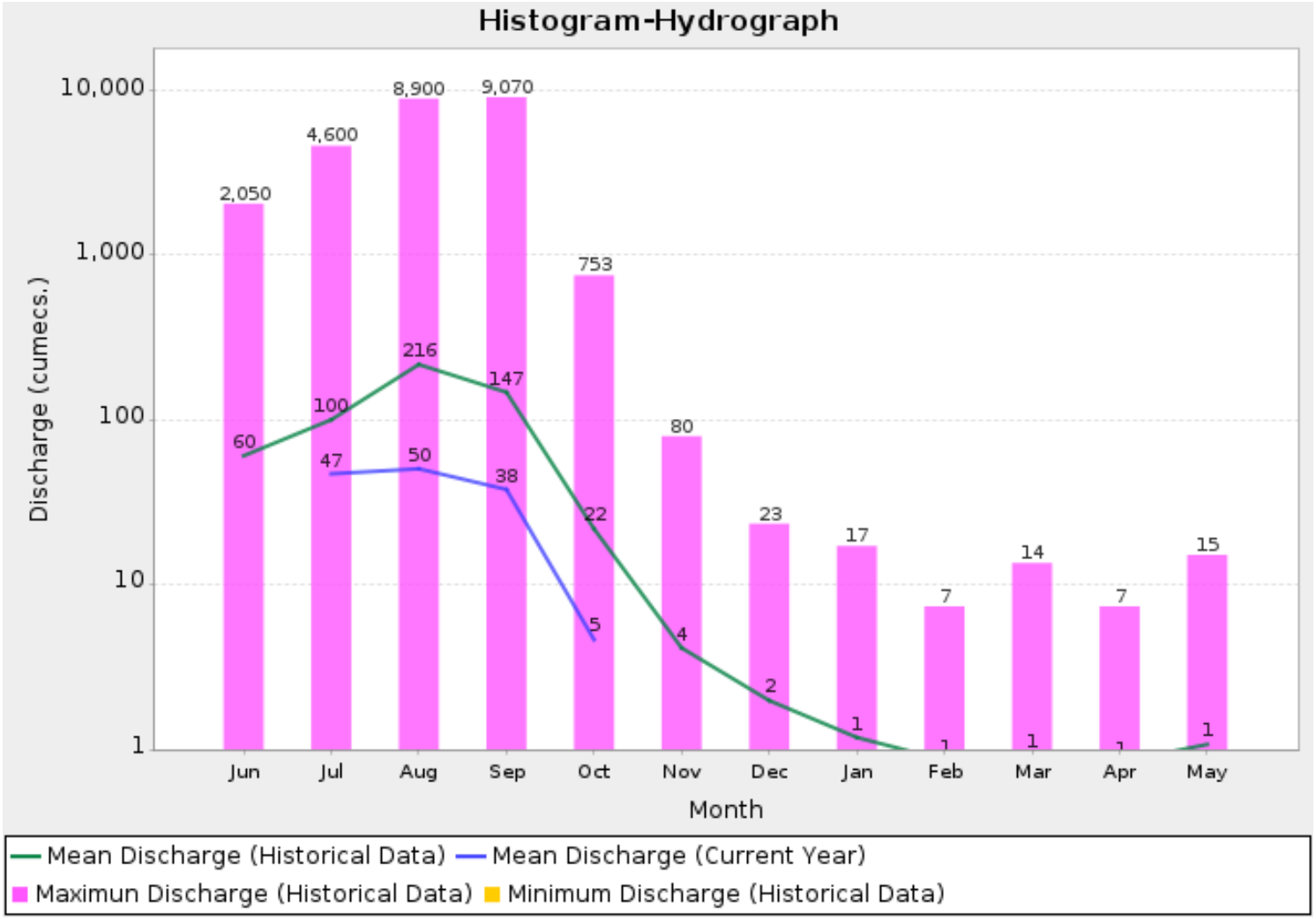
Peak Observed Discharge = 218.7 cumecs on 18/08/2018 Corres. Water Level :19.2 m

Lowest Observed Discharge = 1.165 cumecs on 22/10/2018 Corres. Water Level :17.63 m

Stage Discharge Sheet for Orsang at Chandwada for the period 2018-19

Day	Nov		Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	17.610		17.340		17.300		17.340		17.280		17.200		17.190	
2	17.610		17.340		17.300		17.340		17.280		17.190		17.180	
3	17.610		17.340		17.300		17.340		17.280		17.190		17.180	
4	17.610		17.340		17.300		17.340		17.280		17.190		17.180	
5	17.600		17.340		17.340		17.330		17.280		17.190		17.170	
6	17.600		17.340		17.360		17.330		17.270		17.190		17.170	
7	17.600		17.340		17.360		17.330		17.260		17.190		17.170	
8	17.600		17.340		17.360		17.330		17.250		17.190		17.160	
9	17.600		17.340		17.360		17.330		17.250		17.190		17.130	
10	17.600		17.330		17.350		17.330		17.240		17.190		17.110	
11	17.590		17.330		17.350		17.330		17.240		17.190		17.110	
12	17.590		17.360		17.350		17.330		17.240		17.190		17.110	
13	17.590		17.360		17.350		17.330		17.240		17.190		17.110	
14	17.590		17.360		17.350		17.330		17.240		17.190		17.110	
15	17.590		17.360		17.350		17.330		17.230		17.190		17.110	
16	17.590		17.360		17.350		17.330		17.230		17.190		17.110	
17	17.590		17.360		17.350		17.330		17.230		17.190		17.110	
18	17.590		17.360		17.350		17.330		17.230		17.190		17.110	
19	17.590		17.360		17.350		17.330		17.230		17.190		17.110	
20	17.590		17.360		17.350		17.330		17.220		17.190		17.110	
21	17.590		17.360		17.350		17.330		17.220		17.190		17.110	
22	17.590		17.350		17.340		17.300		17.220		17.190		17.110	
23	17.360		17.350		17.340		17.300		17.210		17.190		17.110	
24	17.360		17.340		17.340		17.300		17.210		17.190		17.110	
25	17.369		17.340		17.340		17.300		17.200		17.190		17.110	
26	17.360		17.340		17.340		17.290		17.200		17.190		17.110	
27	17.350		17.330		17.340		17.290		17.200		17.190		17.110	
28	17.350		17.330		17.340		17.280		17.200		17.190		17.110	
29	17.340		17.320		17.340				17.200		17.190		17.110	
30	17.340		17.310		17.340				17.200		17.190		17.110	
31			17.310		17.340				17.200				17.110	
Ten-Daily Mean														
I Ten-Daily	17.604		17.339		17.333		17.334		17.267		17.191		17.164	
II Ten-Daily	17.590		17.357		17.350		17.330		17.233		17.190		17.110	
III Ten-Daily	17.401		17.335		17.341		17.299		17.205		17.190		17.110	
Monthly														
Min.	17.340		17.310		17.300		17.280		17.200		17.190		17.110	
Max.	17.610		17.360		17.360		17.340		17.280		17.200		17.190	
Mean	17.532		17.343		17.341		17.323		17.234		17.190		17.127	

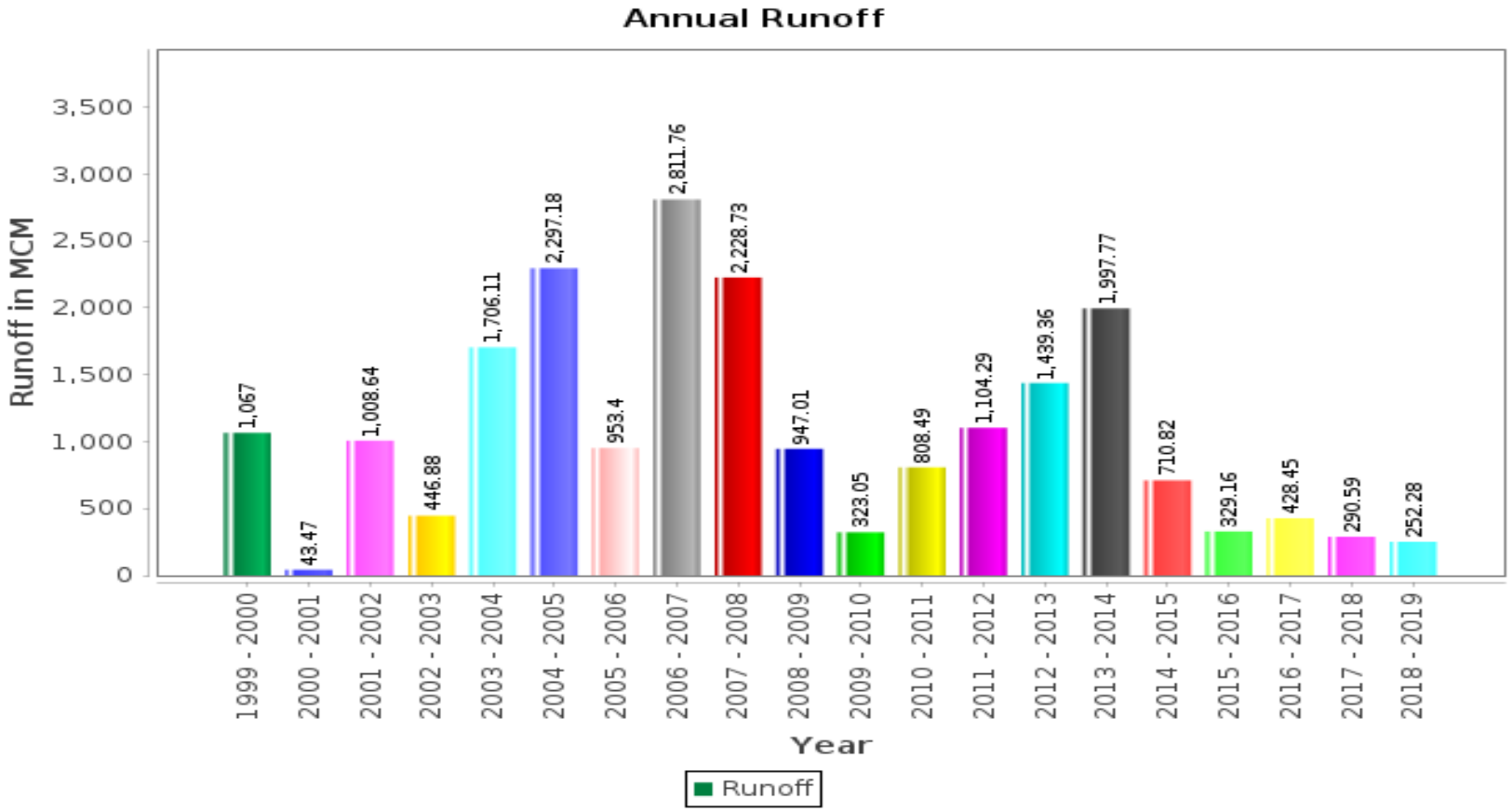
Histogram - Hydrograph for Water Year: 2018-2019 (Data considered: 1981-2019)



Annual Runoff Values for the period (1981 – 2019)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

Local River: Orsang Sub-Division: LNSD, CWC Bharuch

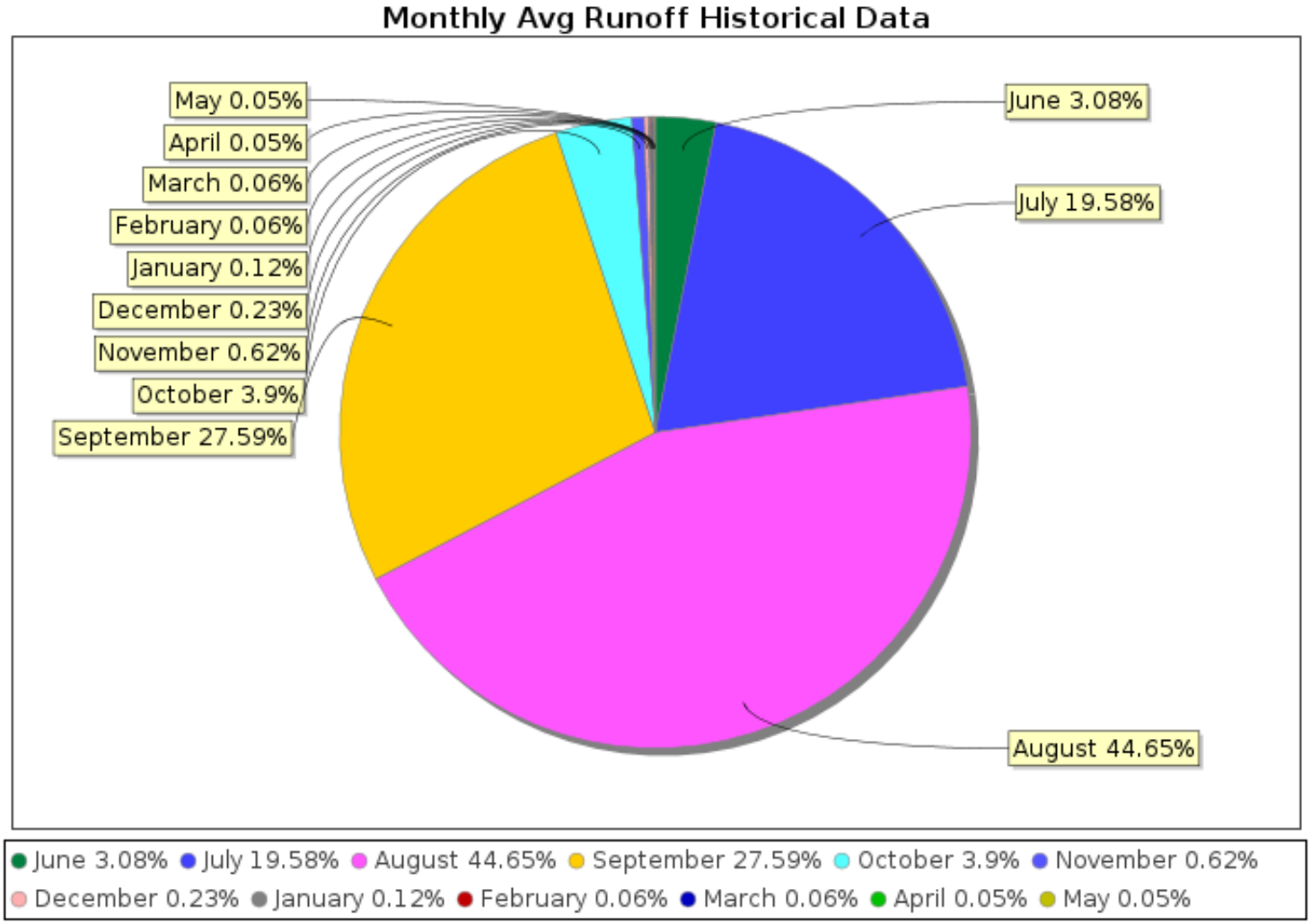


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1981 – 2019)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

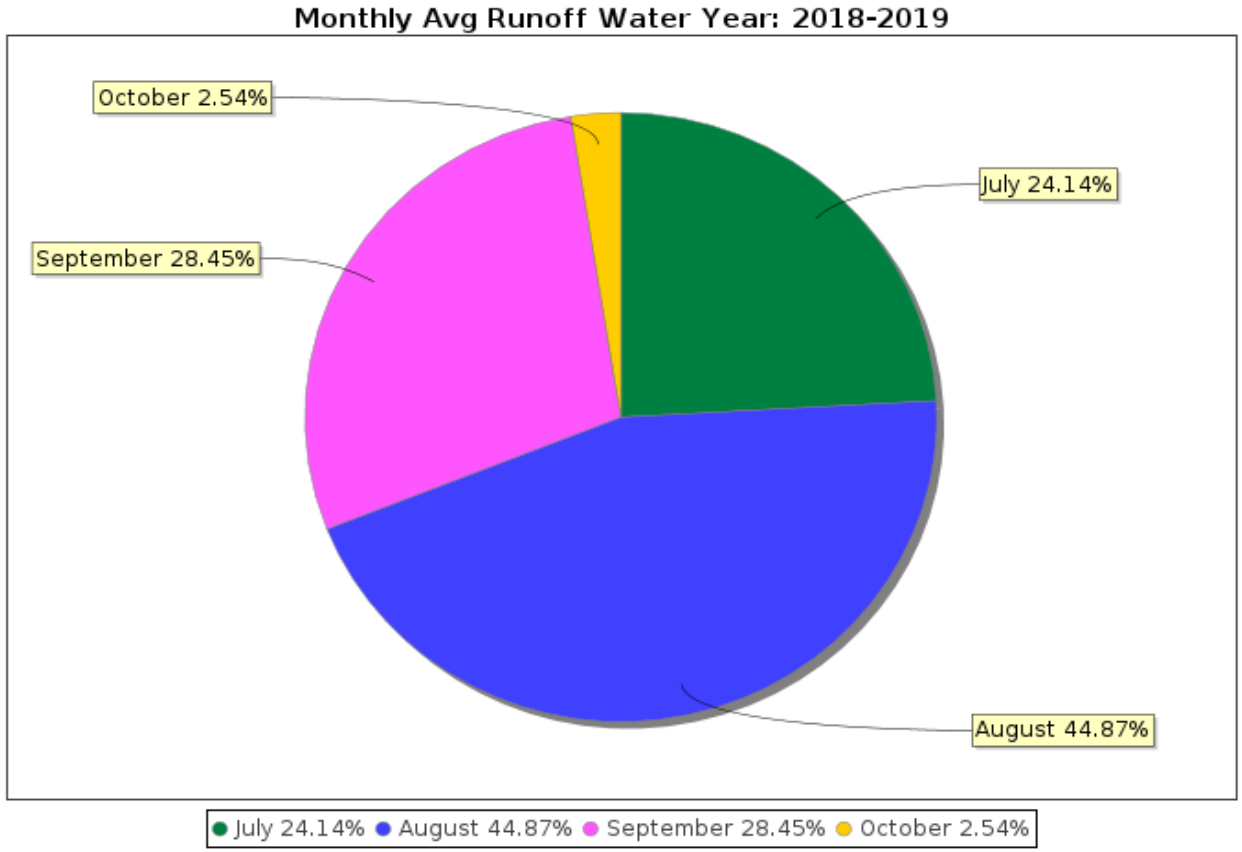
Local River: Orsang Sub-Division: LNSD, CWC Bharuch



Monthly Runoff for the Year (2016-2019)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

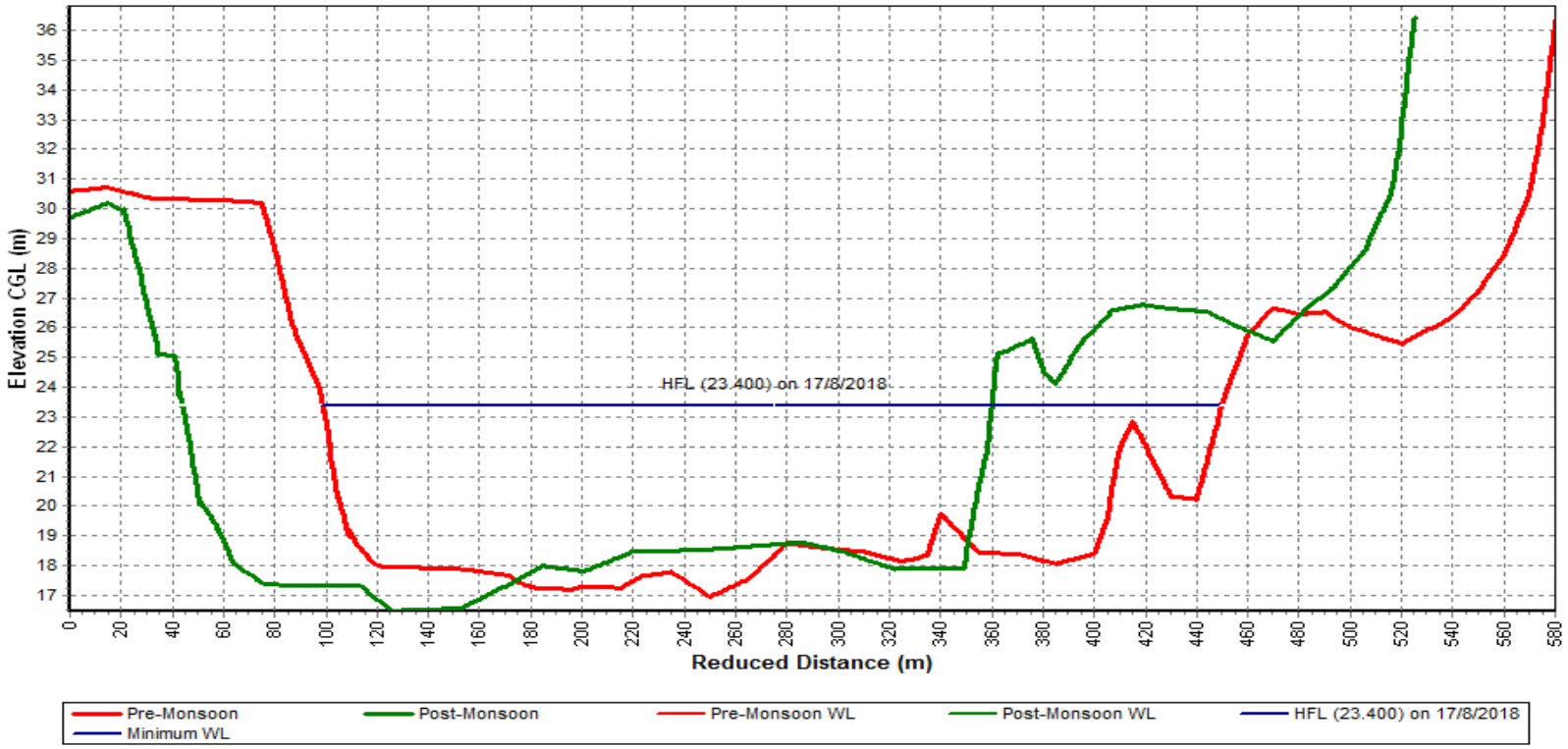
Local River: Orsang Sub-Division: LNSD, CWC Bharuch



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2016-2019)

Station Name: Orsang at Chandwada (01 02 15 032) Division: Tapi Division, Surat

Local River: Orsang Sub-Division: LNSD, CWC Bharuch



4.2 Narmada at Garudeshwar

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Garudeshwar	**Code**	:	003-TDSURAT
State	:	Gujarat	**District**	:	Narmada
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Executive Engineer, Tapi Division, Surat	**Sub-Division**	:	Lower Narmada Sub-Division, Bharuch
Drainage Area	:	null Sq. Km.	**Bank**	:	
Latitude	:	21°53'10''	**Longitude**	:	73°39'16''
Current Zero of Gauge (m)	:	10			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
10.0	22/12/1971	04/06/2014
10.0	31/05/2015	-
10.0	04/06/2014	31/05/2015

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	122.5	14.26	22/03/1972	24.5	14.145	24/05/1972
1972-1973	1085	16.625	24/09/1972	22.3	14.37	31/05/1973
1973-1974	40428.2	39.625	31/08/1973	21.7	14.365	04/06/1973
1974-1975	29904.8	32.195	21/08/1974	24	14.265	31/05/1975
1975-1976	30476.9	31.025	13/09/1975	23.2	14.273	03/06/1975
1976-1977	16374.5	26.49	05/08/1976	35.5	13.95	24/05/1977
1977-1978	24700	27.6	08/08/1977	30.3	14	09/06/1977
1978-1979	40745	34.212	30/08/1978	32.6	14.1	07/06/1978
1979-1980	27475	31.245	11/08/1979	14.6	14.3	31/05/1980
1980-1981	23138	28.1	31/08/1980	14.5	14.31	03/06/1980
1981-1982	22883.4	29.85	11/08/1981	24.7	14.305	16/06/1981
1982-1983	15722.4	25.803	24/08/1982	19.9	14.18	28/05/1983
1983-1984	18150	27.18	12/09/1983	19.1	14.15	01/06/1983
1984-1985	49500	35.88	20/08/1984	21.7	14.185	01/06/1984
1985-1986	14500	24.74	11/08/1985	11.5	14.45	22/03/1986
1986-1987	34700	31.01	16/08/1986	22	14.235	08/06/1986
1987-1988	10800	21.63	29/08/1987	16.2	14.01	24/05/1988
1988-1989	22600	27.27	05/08/1988	26.6	14.07	31/05/1989
1989-1990	14200	23.63	09/08/1989	26	14.02	04/06/1989
1990-1991	52000	36.1	24/08/1990	122	14.17	17/06/1990
1991-1992	22500	27.12	31/07/1991	66	13.73	27/04/1992
1992-1993	10150	22.1	19/08/1992	63.5	13.73	13/06/1992
1993-1994	20973	29.77	17/07/1993	19.17	13.62	25/02/1994
1994-1995	60642	39.78	07/09/1994	88	13.92	31/05/1995
1995-1996	11168	24.1	04/09/1995	44.21	13.81	29/06/1995
1996-1997	28200	33.1	28/07/1996	23.18	13.5	17/10/1996
1997-1998	21849	31.16	27/07/1997	107.2	13.84	23/06/1997
1998-1999	25600	33.8	16/09/1998	54.71	13.48	29/12/1998
1999-2000	23400	30.97	21/09/1999	85.23	13.78	14/06/1999
2000-2001	4460	18.68	01/08/2000	1.84	13.21	16/03/2001
2001-2002	8200	22.16	17/08/2001	5.98	13.58	29/04/2002
2002-2003	18250	29.39	04/09/2002	3.44	13.31	31/05/2003
2003-2004	9850	22.54	30/07/2003	2.88	13.35	27/12/2003

2004-2005	10550	23.5	26/08/2004	3.73	13.4	25/10/2004
2005-2006	7549.75	20.82	06/08/2005	5.54	13.51	11/06/2005
2006-2007	22226.45	31.2	07/08/2006	25.76	13.8	30/01/2007
2007-2008	10600.78	21.7	09/08/2007	1.28	13.64	03/02/2008
2008-2009	741.14	15.6	16/06/2008	16.92	13.71	16/10/2008
2009-2010	10684.21	22.97	12/09/2009	11.42	13.7	27/12/2009
2010-2011	4542.92	18.83	10/09/2010	2.15	13.72	29/06/2010
2011-2012	11631.56	25.6	28/08/2011	30.36	13.61	30/10/2011
2012-2013	26586.36	29.35	09/08/2012	17.38	13.44	03/03/2013
2013-2014	32056.75	34.56	25/08/2013	38.44	13.57	03/06/2013
2014-2015	10016.13	23.145	09/09/2014	0	13.2	04/11/2014
2015-2016	4804.96	18.74	07/08/2015	0	13.65	03/07/2015
2016-2017	8995.63	21.975	10/08/2016	0	13.68	28/01/2017
2017-2018	503.51	15.405	24/06/2017	18.88	13.71	15/05/2018
2018-2019	62.6	14.24	18/08/2018	16.37	13.96	01/01/2019

Stage Discharge Sheet for Narmada at Garudeshwar for the period 2018-19

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	13.760	19.67	14.000	45.00 *	14.110	46.27	14.040	29.50	13.870	17.51	14.050	20.49
2	13.760	19.69	13.900	46.55	14.140	47.42	14.050	29.00 *	13.810	15.00 *	14.150	23.07
3	13.770	19.00 *	13.900	25.40	14.140	47.07	13.950	24.00 *	13.800	15.42	14.140	23.05
4	13.760	19.53	13.860	23.90	14.170	48.05	13.950	24.08	13.800	16.01	14.140	18.00 *
5	13.760	19.67	13.810	21.80	14.170	48.00 *	13.870	20.83	13.820	16.54	14.130	20.25
6	13.750	19.18	13.765	19.50	14.160	47.30	13.840	20.50	13.870	17.56	14.140	18.68
7	13.750	19.02	13.850	23.64	14.140	47.00	13.805	19.59	13.850	17.00 *	14.140	18.00 *
8	13.750	19.00	13.650	16.00 *	14.210	60.59	13.790	18.39	13.765	15.48	14.130	18.49
9	13.750	19.30	13.730	18.03	14.015	41.63	13.910	23.00 *	13.670	13.41	14.130	18.53
10	13.740	19.00 *	13.760	19.08	13.920	26.00	13.920	23.04	13.710	14.11	14.130	18.37
11	13.750	19.00	13.760	19.10	13.785	20.64	13.900	22.91	13.750	14.87	14.120	18.00 *
12	13.790	20.40	13.740	18.98	13.760	19.00 *	13.900	22.85	13.760	14.99	14.130	18.51
13	13.790	20.47	13.780	20.41	13.870	20.83	13.880	21.00 *	13.830	16.64	14.130	18.37
14	13.780	20.41	13.760	19.10	13.040	41.36	13.880	21.55	13.840	16.00 *	14.130	18.46
15	13.780	20.10	13.770	19.00 *	14.050	41.00 *	13.800	19.20	13.870	17.32	14.100	18.05
16	13.780	20.00 *	13.890	24.91	14.060	41.49	13.850	20.00 *	13.880	18.26	14.110	18.23
17	13.770	20.00 *	13.860	24.56	14.210	58.34	13.770	16.68	13.835	16.54	14.050	18.04
18	13.780	20.24	13.900	25.50	14.240	62.49	13.800	19.23	13.870	17.52	14.100	18.00 *
19	13.800	21.44	13.910	27.40	14.170	43.00 *	13.850	20.38	13.800	16.00 *	14.050	18.04
20	13.810	21.56	13.930	27.59	14.170	43.08	13.900	21.93	13.820	16.24	14.060	18.08
21	13.800	21.27	13.980	42.31	14.060	39.28	13.900	21.00 *	13.850	18.00 *	14.060	18.00 *
22	13.780	20.20	14.090	50.00 *	14.110	40.00 *	13.920	23.35	13.850	16.34	14.060	18.16
23	13.760	19.25	14.060	46.82	14.110	41.15	13.970	24.00 *	13.850	16.49	14.070	18.00 *
24	13.770	19.00 *	14.000	45.11	14.080	30.73	14.020	28.59	13.850	16.40	14.060	18.02
25	13.770	19.50	14.070	47.70	14.040	29.66	13.900	21.83	13.920	18.03	14.060	18.00 *
26	13.900	25.46	14.175	60.37	14.010	27.00 *	13.830	19.38	13.900	17.34	14.060	17.75
27	13.570	16.49	14.180	60.52	13.970	25.03	13.810	15.83	14.015	27.37	14.060	17.81
28	13.700	18.22	14.175	60.31	13.930	24.43	13.800	15.38	13.900	24.00 *	14.060	17.84
29	14.080	51.98	14.240	60.00 *	13.920	23.24	13.890	18.55	13.920	17.49	14.080	18.05
30	14.020	51.29	14.200	58.57	13.900	22.73	13.860	18.00 *	13.995	18.56	14.070	17.60
31			14.050	45.38	13.900	23.08			14.065	20.62		
Ten-Daily Mean												
I Ten-Daily	13.755	19.31	13.822	25.89	14.118	45.93	13.913	23.19	13.796	15.80	14.128	19.69
II Ten-Daily	13.783	20.36	13.830	22.66	13.935	39.12	13.853	20.57	13.826	16.44	14.098	18.18
III Ten-Daily	13.815	26.27	14.111	52.46	14.003	29.67	13.890	20.59	13.920	19.15	14.064	17.92
Monthly												
Min.	13.570	16.49	13.650	16.00	13.040	19.00	13.770	15.38	13.670	13.41	14.050	17.60
Max.	14.080	51.98	14.240	60.52	14.240	62.49	14.050	29.50	14.065	27.37	14.150	23.07
Mean	13.784	21.98	13.927	34.28	14.018	37.96	13.885	21.45	13.850	17.2	14.097	18.6

Annual Runoff in MCM = 699 Annual Runoff in mm = 8

Peak Observed Discharge = 187.4 cumecs on 28/05/2019 Corres. Water Level :14.15 m

Lowest Observed Discharge = 1.480 cumecs on 05/03/2019 Corres. Water Level :14.02 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge

#:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Narmada at Garudeshwar for the period 2018-19

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	14.070	17.72	13.960	16.31	14.080	18.64	14.020	17.89	14.110	18.43	14.030	17.26
2	14.070	17.00 *	13.990	17.23	14.080	18.44	14.020	17.72	14.140	18.99	14.050	17.46
3	14.070	18.10	14.060	18.13	14.070	18.00 *	14.040	17.00 *	14.060	17.97	14.070	17.87
4	14.070	18.20	14.070	18.37	14.080	18.49	14.040	17.68	13.980	16.21	14.060	17.81
5	14.040	17.00	14.070	18.49	14.060	18.03	14.020	1.480	13.950	16.34	14.060	17.00 *
6	14.060	18.20	14.070	18.00 *	14.060	18.20	14.010	17.21	13.960	16.61	14.050	17.81
7	14.060	18.28	14.170	20.13	14.060	18.35	14.010	17.24	13.990	17.00 *	14.020	17.50
8	14.070	18.57	14.220	22.05	14.060	18.32	14.010	17.21	14.060	17.89	14.030	17.83
9	14.080	18.00 *	14.210	21.98	14.050	17.49	14.010	17.14	14.110	18.20	14.040	17.58
10	14.090	18.69	14.190	21.23	14.050	17.00 *	14.010	17.00 *	14.110	18.04	14.030	17.27
11	14.090	18.77	14.170	20.00	13.950	17.29	14.010	14.17	14.150	18.13	14.020	17.37
12	14.100	18.93	14.160	19.98	13.940	17.19	14.030	17.27	14.160	18.19	14.030	17.00 *
13	14.060	18.38	14.150	19.00 *	13.940	17.21	14.000	16.00	14.160	18.41	14.030	17.31
14	14.060	17.55	14.150	19.00 *	13.940	17.27	14.000	16.03	14.150	18.00 *	14.030	17.41
15	14.070	18.00	14.130	19.33	13.940	17.18	14.000	16.87	14.080	17.82	14.050	17.86
16	14.070	18.00 *	14.120	19.17	13.940	16.48	13.980	16.55	14.060	17.21	14.050	17.41
17	14.080	18.39	14.120	19.07	13.940	17.00 *	13.980	16.00 *	14.050	17.00 *	14.050	17.61
18	14.080	18.54	14.130	19.49	14.010	18.25	13.980	16.56	14.010	17.04	14.050	17.00 *
19	14.130	20.25	14.120	19.30	14.110	18.71	14.010	17.11	14.010	17.00 *	14.050	17.00 *
20	14.090	18.77	14.160	19.00 *	14.100	18.20	14.010	17.73	13.980	17.04	14.070	18.05
21	14.070	18.34	14.160	19.68	14.110	18.32	14.010	17.00 *	13.980	17.00 *	14.120	18.37
22	14.060	17.84	14.160	19.85	14.070	18.06	14.050	18.09	13.980	16.02	14.120	18.15 *
23	14.060	17.00 *	14.160	19.94	14.070	17.98	14.060	18.43	13.980	16.00	14.130	18.21
24	14.040	17.97	14.140	19.44	14.070	17.00 *	14.080	18.00 *	14.070	16.46	14.170	18.45
25	14.040	17.00 *	14.140	19.45	14.020	17.81	14.070	18.50	14.090	16.11	14.140	18.49
26	14.040	17.23	14.140	19.00 *	14.060	18.14	14.080	18.39	14.110	17.73	14.170	18.00 *
27	14.010	16.97	14.140	19.00 *	14.010	17.61	14.090	18.71	14.100	18.00	14.170	18.41
28	13.970	16.58	14.040	19.09	14.020	17.82	14.080	17.84	14.100	18.39 *	14.150	187.4
29	13.970	16.67	14.060	18.43			14.110	18.21	14.090	18.65	14.150	18.29
30	13.980	16.00 *	14.060	18.10			14.110	18.20	14.050	17.84	14.500	43.00 *
31	13.980	16.71	14.070	18.17			14.100	18.00 *			14.320	42.66
Ten-Daily Mean												
I Ten-Daily	14.068	17.98	14.101	19.19	14.065	18.10	14.019	15.76	14.047	17.57	14.044	17.54
II Ten-Daily	14.083	18.56	14.141	19.33	13.981	17.48	14.000	16.43	14.081	17.58	14.043	17.40
III Ten-Daily	14.020	17.12	14.115	19.10	14.054	17.84	14.076	18.12	14.055	17.22	14.195	38.13
Monthly												
Min.	13.970	16.00	13.960	16.31	13.940	16.48	13.980	1.480	13.950	16.00	14.020	17.00
Max.	14.130	20.25	14.220	22.05	14.110	18.71	14.110	18.71	14.160	18.99	14.500	187.4
Mean	14.056	17.86	14.119	19.21	14.032	17.8	14.033	16.81	14.061	17.46	14.097	24.8

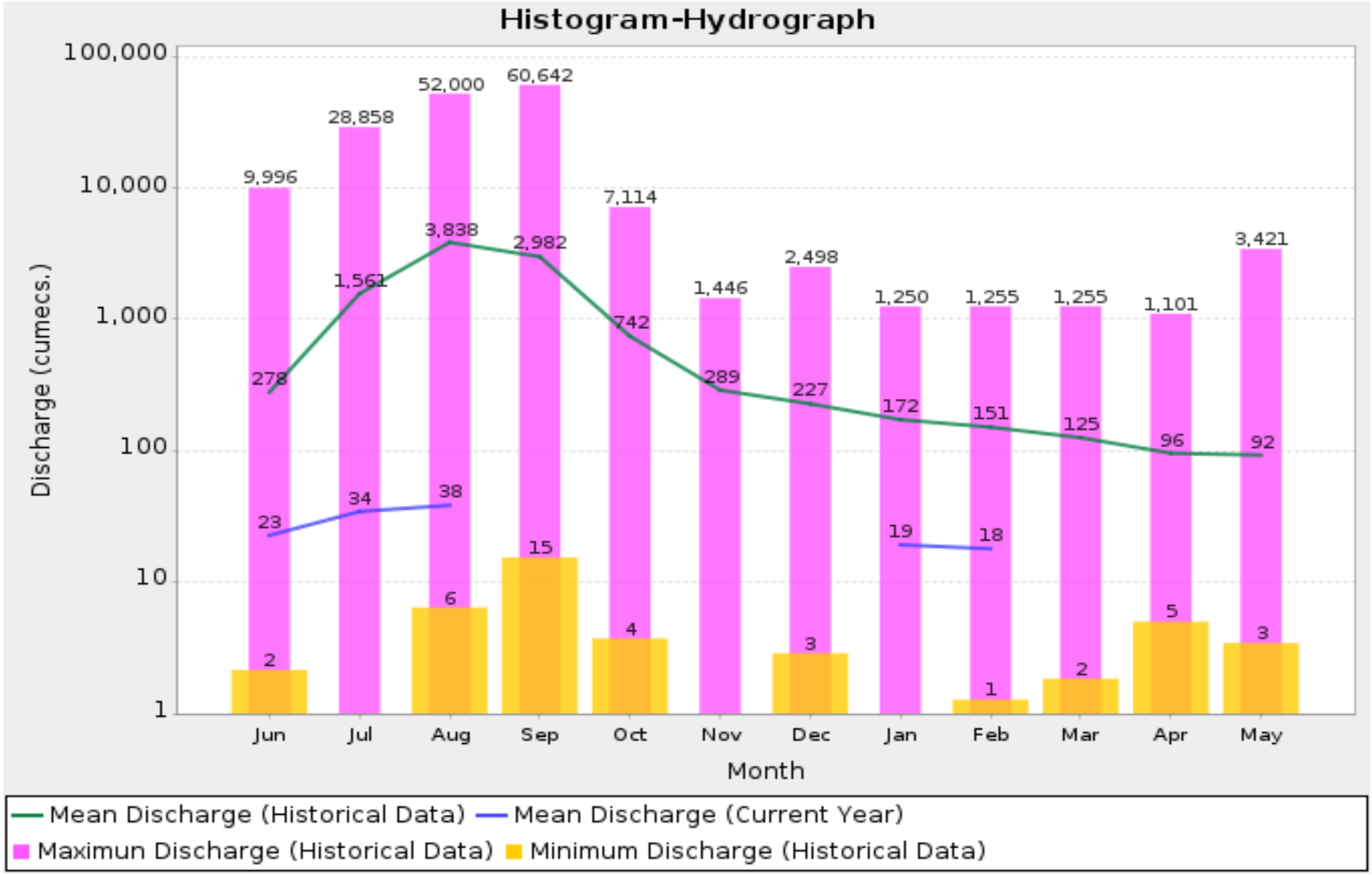
Peak Computed Discharge = 60.00 cumecs on 29/07/2018 Corres. Water Level :14.24 m

Lowest Computed Discharge = 15.00 cumecs on 02/10/2018 Corres. Water Level :13.81 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge

#:Discarded Discharge (values changed as per rating curve) ***Note:Missing values ignored while arriving at Annual Runoff***

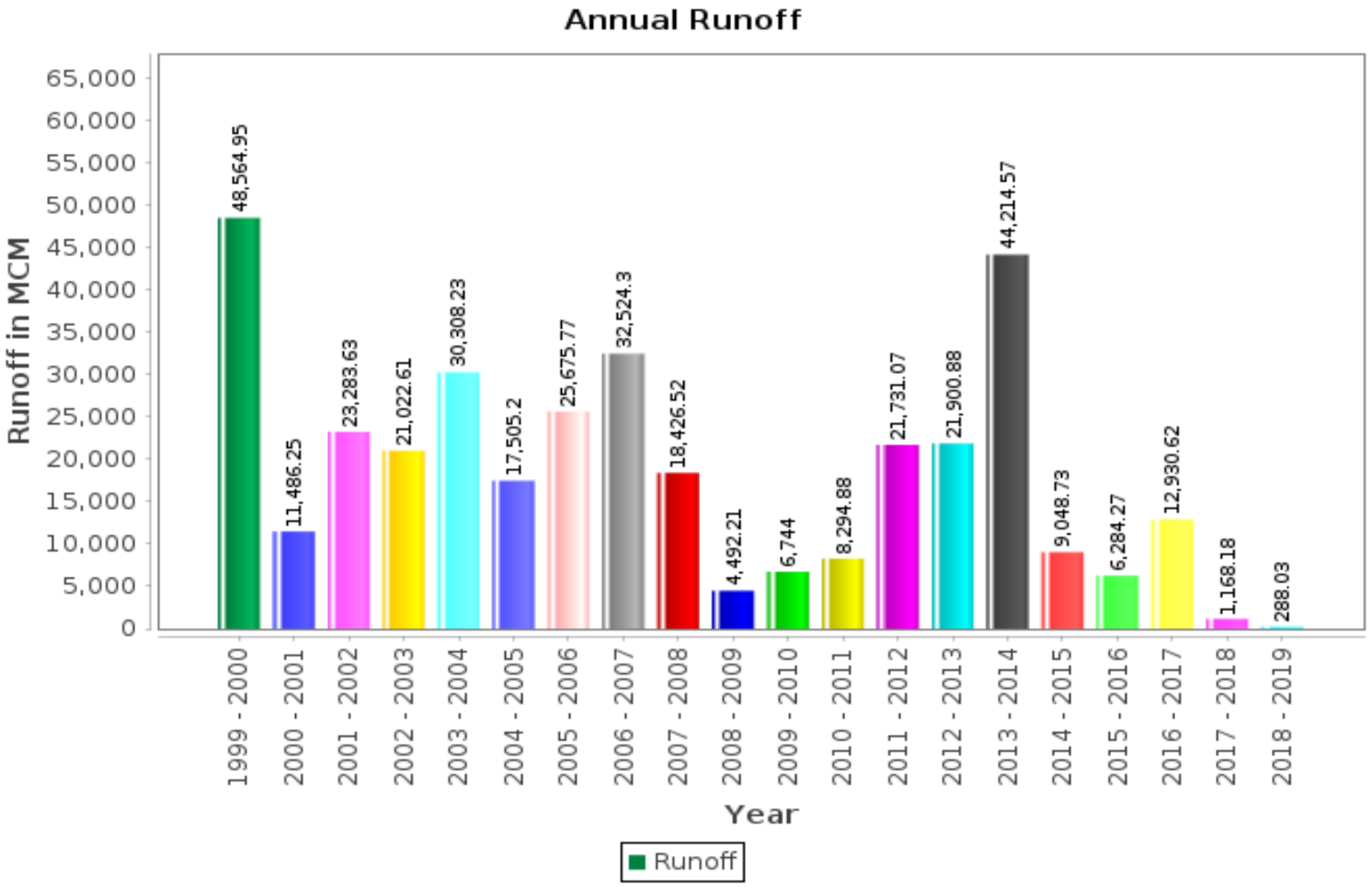
Histogram - Hydrograph for Water Year: 2017-2019 (Data considered: 1972-2019)



Annual Runoff Values for the period (1972 – 2019)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

Local River: Narmada Sub-Division:LNSD,CWBharuch



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

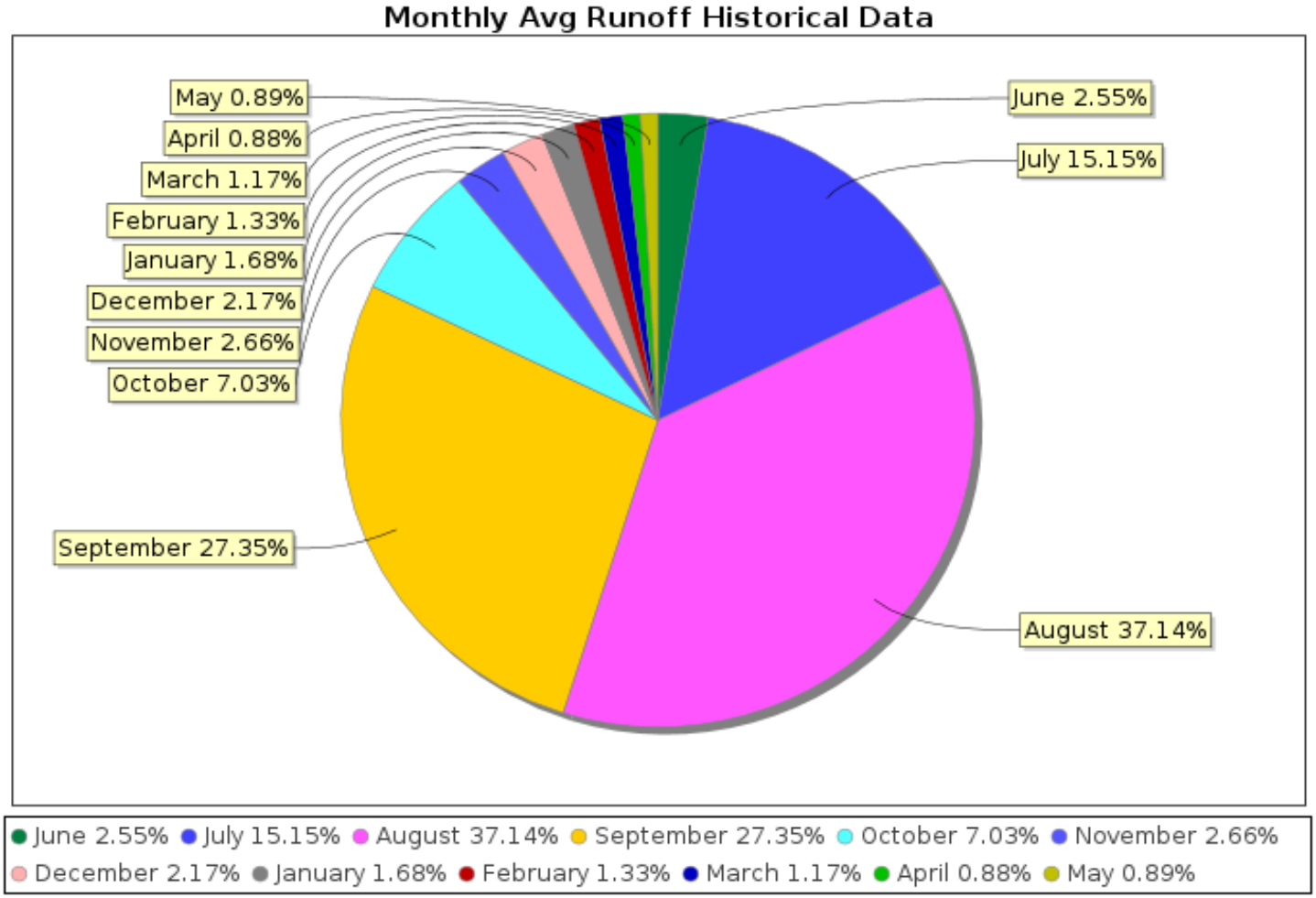
Monthly Average Runoff based on period (1972 – 2019)

Station Name: Narmada at Garudeshwar (01 02 15 030)

Division: Tapi Division, Surat

Local River: Narmada

Sub-Division: LNSD, CWC Bharuch



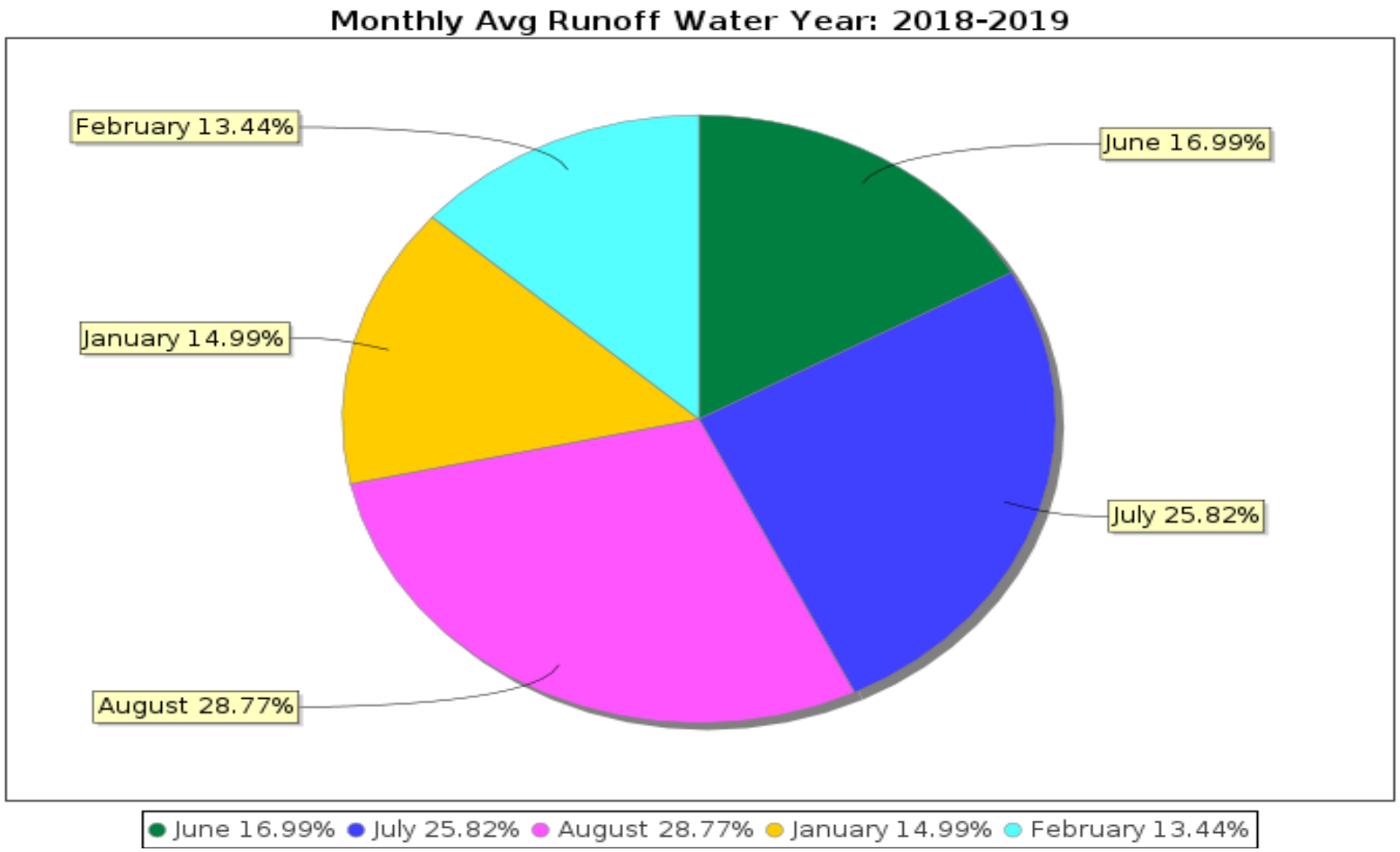
Monthly Runoff for the Year(2018-19)

Station Name : Narmada at Garudeshwar (01 02 15 030)

Division : Tapi Division, Surat

Local River : Narmada

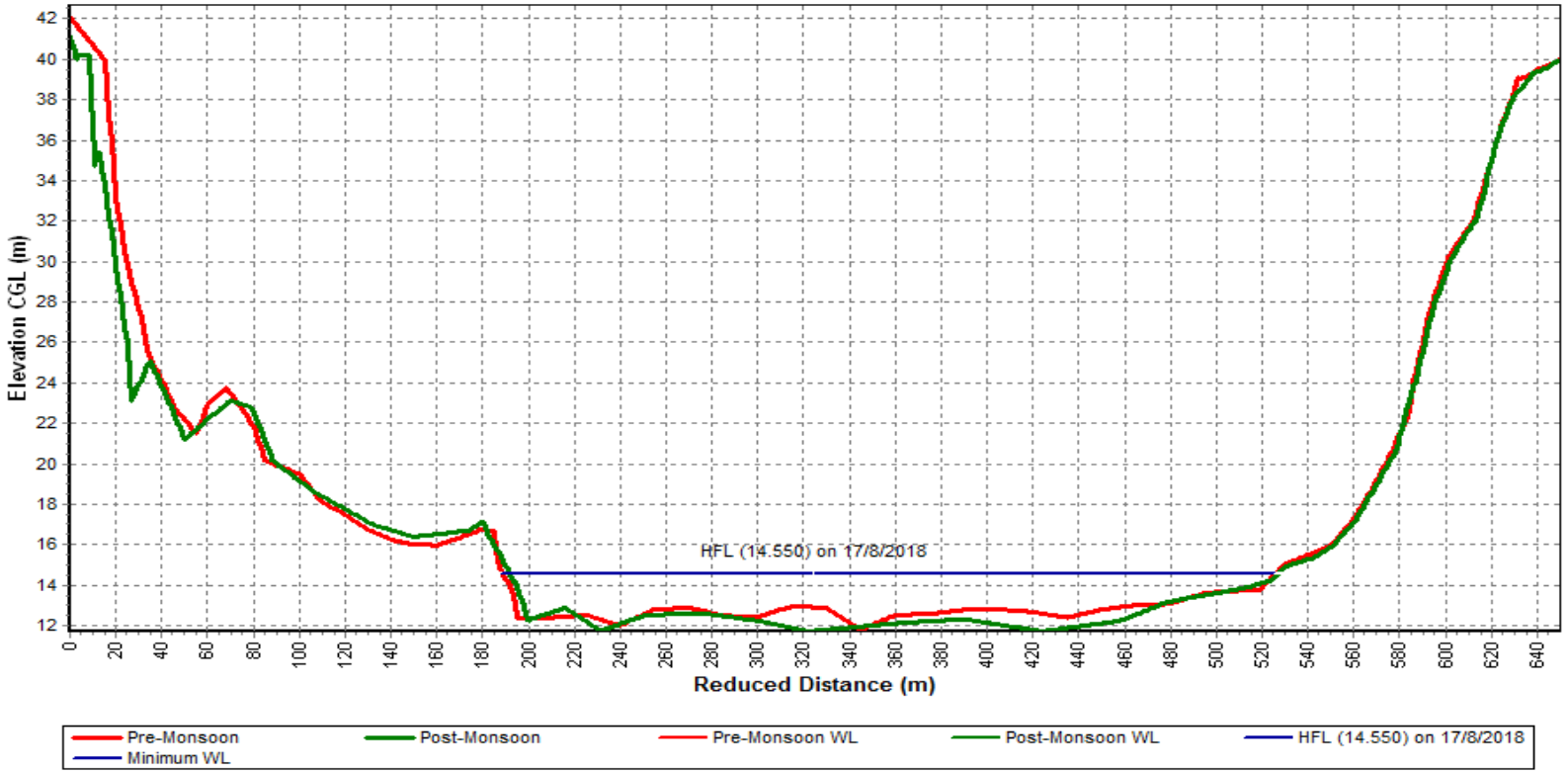
Sub-Division : LNSD, CWC Bharuch



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2017-2019)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

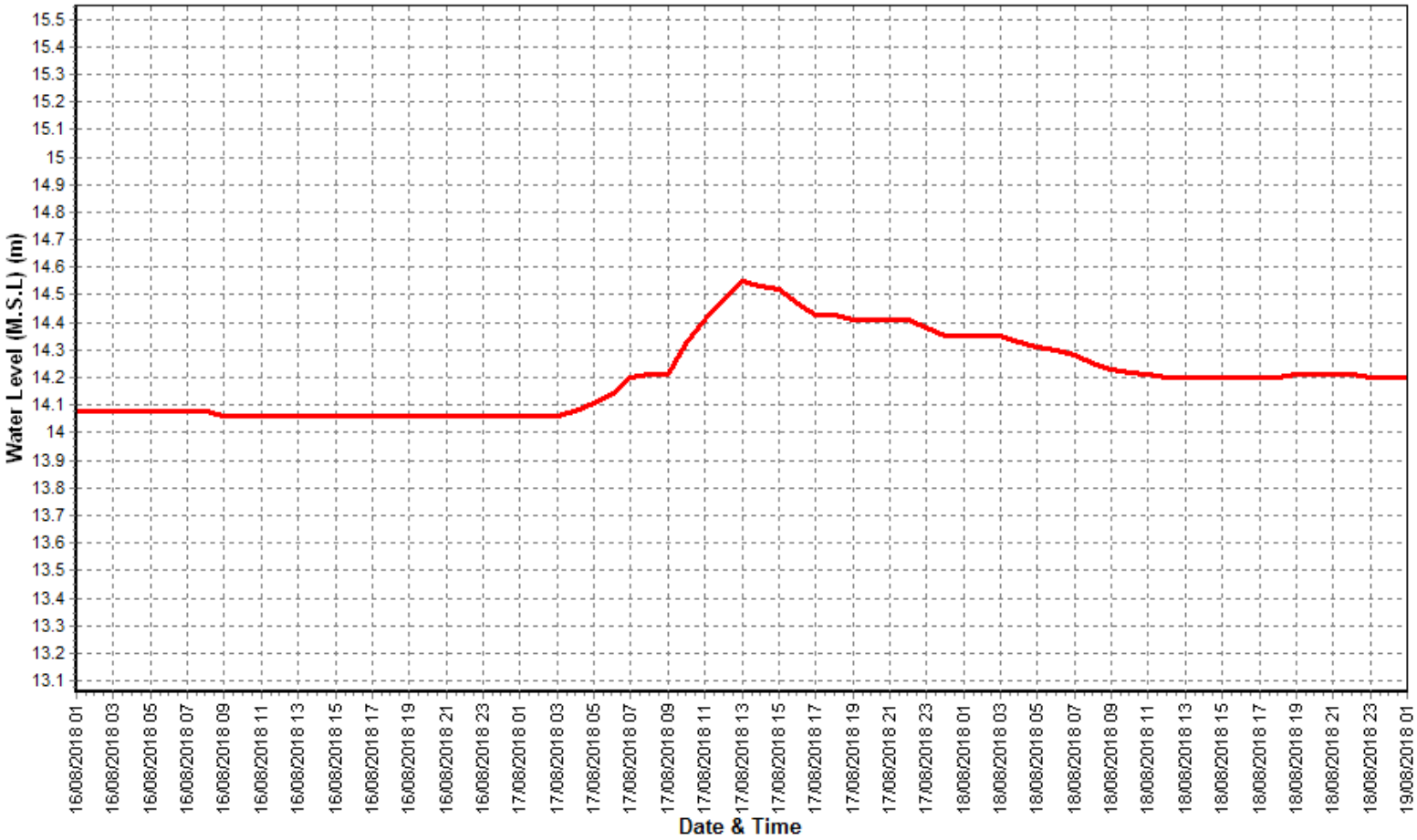
Local River: Narmada Sub-Division: LNSD, CWC Bharuch



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-2019)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

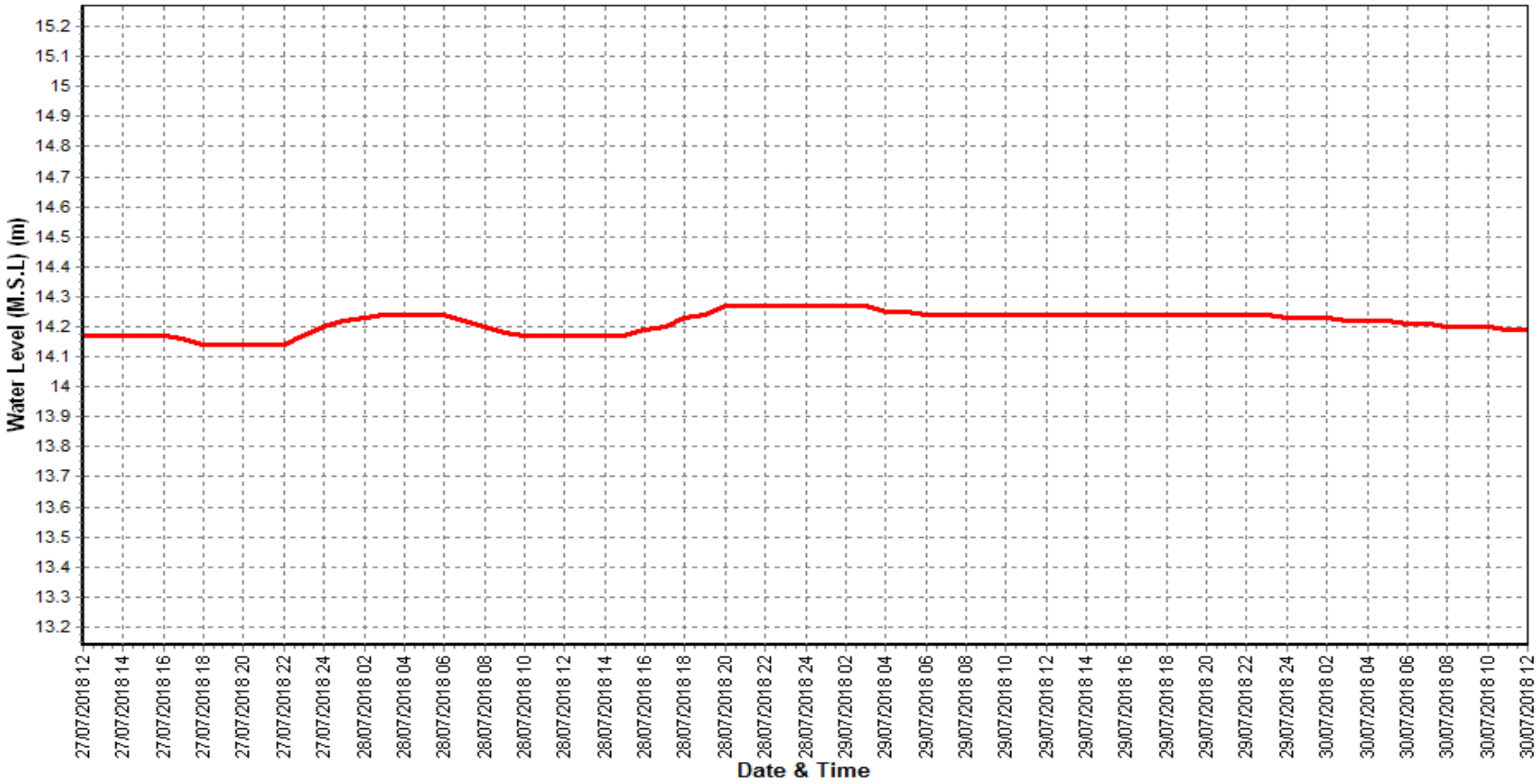
Local River: Narmada Sub-Division: LNSD, CWC Bharuch



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-2019)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

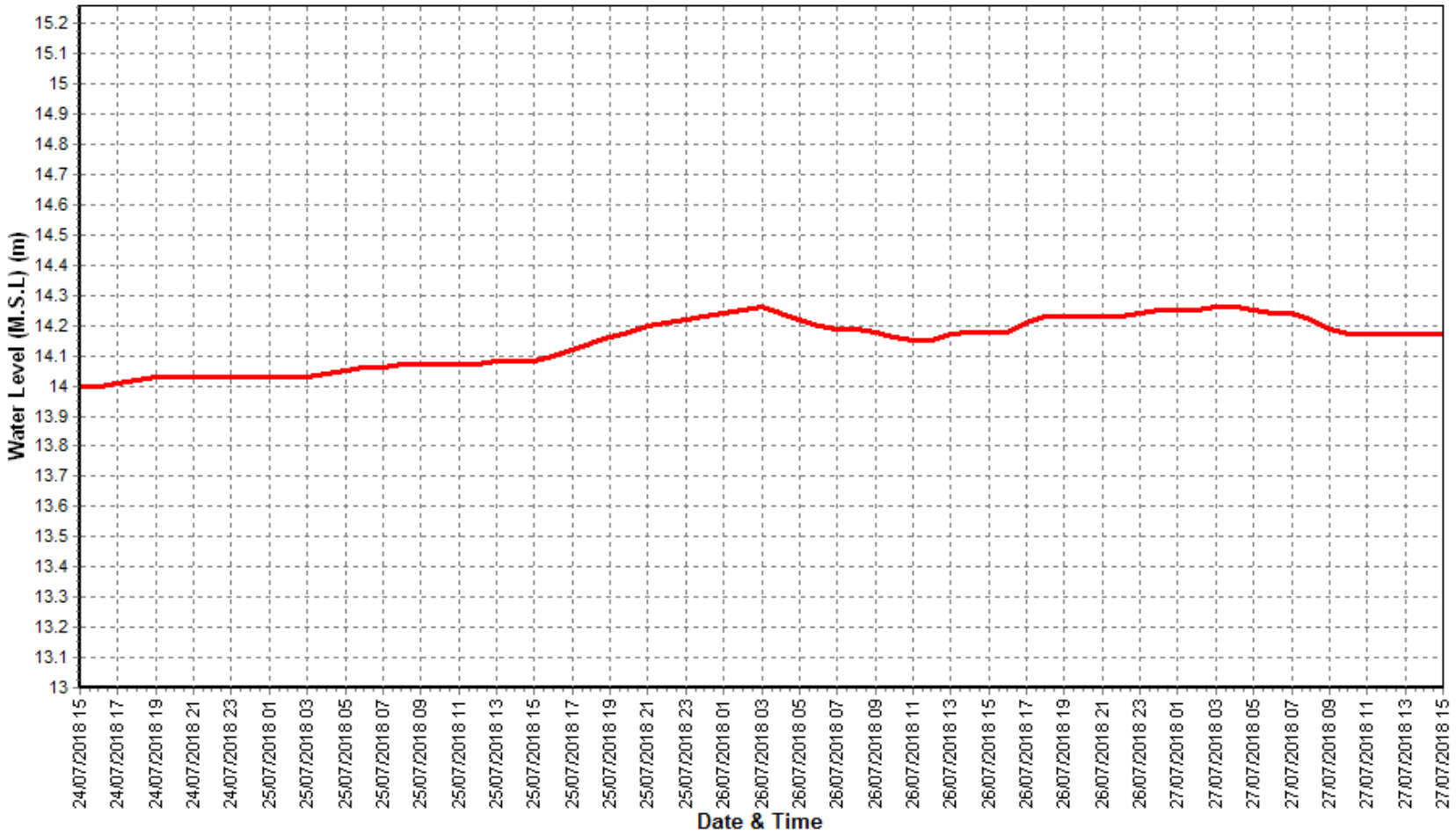
Local River: Narmada Sub-Division: LNSD, CWC Bharuch



Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-2019)

Station Name: Narmada at Garudeshwar (01 02 15 030) Division: Tapi Division, Surat

Local River: Narmada Sub-Division: LNSD, CWC Bharuch



4.3 Narmada at Mandleshwar

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Mandleshwar	**Code**	:	017-NDBHP
State	:	Madhya Pradesh	**District**	:	Khargone
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-III, Indore
Drainage Area	:	72809.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°10'18''	**Longitude**	:	75°39'39''
Current Zero of Gauge (m)	:	138			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/12/1970	
Discharge	:	28/08/1971	
Sediment	:	14/04/1972	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
138.0	14/10/2016	05/01/2017
138.0	05/01/2017	-
138.0	16/12/1970	14/10/2016

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1970-1971	0	139.235	23/05/1971	0	139.235	23/05/1971
1971-1972	13019	148.61	07/09/1971	30.9	139.185	30/05/1972
1972-1973	18973.7	149.713	02/09/1972	26.5	139.135	28/05/1973
1973-1974	44900	157.1	31/08/1973	28.2	139.225	25/05/1974
1974-1975	31454	153.215	20/08/1974	32.4	139.14	30/05/1975
1975-1976	32213.6	152.685	12/09/1975	19.1	139.186	16/06/1975
1976-1977	12927.9	147.073	06/08/1976	11	139.505	30/12/1976
1977-1978	24844	150.1	15/09/1977	55.4	139.245	26/05/1978
1978-1979	27373.4	150.575	30/08/1978	49.9	139.215	08/06/1978
1979-1980	32084.3	151.6	10/08/1979	34.5	139.09	26/05/1980
1980-1981	21843.6	149.75	30/08/1980	37.5	139.26	02/06/1980
1981-1982	27983.8	151.905	10/08/1981	39.2	139.275	17/05/1982
1982-1983	17050	147.935	23/08/1982	36.3	139.235	28/05/1983
1983-1984	19420	148.97	11/09/1983	24.6	139.16	10/06/1983
1984-1985	46000	155.55	19/08/1984	33.9	139.19	31/05/1985
1985-1986	13850	147.71	10/08/1985	30.2	139.235	26/05/1986
1986-1987	32600	152.55	15/08/1986	31.8	139.22	11/06/1986
1987-1988	21313	149.19	28/08/1987	16.43	139.12	31/05/1988
1988-1989	21400	149.2	05/08/1988	11.92	139.08	06/06/1988
1989-1990	13650	147.07	08/08/1989	16	139.1	04/06/1989
1990-1991	37750	153.2	23/08/1990	108	139.5	14/06/1990
1991-1992	21750	149.2	31/07/1991	22.6	139.77	08/06/1991
1992-1993	9900	145.68	18/08/1992	40	139.4	09/06/1992
1993-1994	29000	151.8	17/07/1993	47.15	139.29	14/06/1993
1994-1995	48200	157.23	06/09/1994	118.2	139.66	19/05/1995
1995-1996	12500	147	25/07/1995	58	139.37	26/05/1996
1996-1997	31025	152	28/07/1996	69.48	139.42	26/06/1996
1997-1998	33500	153.15	26/07/1997	70	139.37	12/06/1997
1998-1999	27900	151.15	15/09/1998	54.14	139.29	31/05/1999
1999-2000	30150	151.66	21/09/1999	39.91	139.29	10/06/1999
2000-2001	5790	143.98	31/07/2000	55.15	139.39	05/05/2001
2001-2002	11725	146	16/08/2001	51.69	139.36	04/06/2001
2002-2003	14950	147.98	03/09/2002	57	139.42	25/05/2003
2003-2004	11905	146.66	29/07/2003	3.46	138.82	27/11/2003

2004-2005	12100	146.74	25/08/2004	12	139.03	14/04/2005
2005-2006	8793.7	145.3	04/08/2005	51.53	139.38	30/03/2006
2006-2007	18482.74	148.55	20/08/2006	15.3	139.3	22/04/2007
2007-2008	10691.59	145.82	08/08/2007	69.9	139.4	20/06/2007
2008-2009	1583.65	141.65	20/07/2008	149.81	139.78	09/06/2008
2009-2010	15828.13	147.75	12/09/2009	82.57	139.78	12/11/2009
2010-2011	10257.83	145.99	09/09/2010	84.86	139.52	23/06/2010
2011-2012	17698.74	148.75	27/08/2011	266.55	139.94	08/05/2012
2012-2013	33479.3	153.15	06/09/2012	46.27	139.49	17/02/2013
2013-2014	46398.29	154.575	24/08/2013	214.02	139.575	12/05/2014
2014-2015	10407.92	145.75	08/09/2014	3.17	139.09	11/07/2014
2015-2016	2311.07	142.12	17/08/2015	138.94	139.42	30/05/2016
2016-2017	10200	146.07	09/08/2016	106.3	139.51	29/06/2016
2017-2018	2620.52	142.29	15/09/2017	0	138	30/03/2018
2018-2019	4856.07	143.28	17/08/2018	29.87	139.19	08/08/2018

Stage Discharge Sheet for Narmada at Mandleshwar for the period 2018-19

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	139.840	196.0	140.920	1070 *	139.240	38.10	141.300	1457	140.850	932.5	140.750	860.1
2	139.330	63.10	139.850	233.4	139.270	46.40	141.100	1290 *	140.260	442.0 *	141.380	1519
3	139.300	55.00 *	139.940	274.8	139.300	56.10	141.510	1339	140.250	439.4	141.540	1678
4	139.300	55.10	139.700	167.3	139.480	101.3	140.940	1066	139.850	234.5	141.400	1540 *
5	139.390	77.40	139.470	101.5	139.450	87.00 *	141.200	1371	141.050	1168	140.680	795.0
6	139.590	135.5	139.690	164.6	139.470	96.40	140.210	427.3	141.280	1309	140.430	569.9
7	139.570	127.4	140.270	446.6	139.280	44.50	139.710	179.2	141.280	1310 *	140.080	341.0 *
8	139.580	130.2	140.620	710.0 *	139.190	29.30	139.620	130.6	140.830	914.3	139.640	134.7
9	139.480	105.2	139.690	164.0	139.590	128.3	141.300	1456 *	140.870	954.0	139.530	118.4
10	139.440	93.00 *	139.440	83.10	139.590	127.8	141.390	1530	140.860	944.3	139.780	201.3
11	139.360	64.59	139.300	53.60	139.660	153.3	141.580	1752	139.990	293.5	139.890	260.0 *
12	139.570	130.4	140.650	787.3	139.750	186.0 *	140.920	1065	140.030	312.3	140.240	435.7
13	139.980	289.8	140.390	551.2	139.650	149.6	140.720	825.0 *	139.860	238.9	140.560	665.8
14	139.990	264.8	140.370	538.2	139.890	241.1	140.530	645.7	139.860	238.0 *	139.990	295.4
15	139.530	119.2	141.440	1600 *	139.570	128.0 *	140.750	868.3	140.580	687.3	139.900	255.6
16	139.550	125.0 *	139.930	273.4	139.770	191.0	140.850	984.0 *	140.280	449.1	139.620	131.5
17	139.450	95.00 *	139.580	129.8	143.280	4325	141.110	1244	140.750	819.2	139.750	188.2
18	139.700	167.2	139.400	76.40	140.540	653.2	141.290	1344	140.520	660.0	140.250	428.0 *
19	140.200	411.5	139.350	71.30	140.160	374.0 *	140.620	716.8	140.410	560.0 *	140.560	665.4
20	140.170	396.0	139.280	49.20	139.980	283.8	140.920	1068	140.270	443.7	140.540	633.5
21	141.040	1089	139.300	55.10	140.170	374.6	140.010	306.0 *	140.500	635.0 *	140.450	590.0 *
22	139.950	277.0	139.290	52.00 *	142.320	2680 *	139.800	231.1	139.840	230.0	140.460	592.6
23	139.770	197.8	139.370	72.60	140.910	1057	142.450	2850 *	139.830	228.2	140.310	460.0 *
24	140.560	658.0 *	140.000	295.5	140.600	705.9	140.880	1010	140.300	455.7	140.280	439.6 *
25	139.840	228.9	139.520	116.3	140.310	466.3	140.820	919.6	140.540	635.7	140.380	525.0 *
26	139.850	233.6	139.390	74.40	140.040	315.0 *	140.460	598.9	140.350	503.3	140.030	311.5
27	139.930	269.8	139.280	49.20	141.540	1708	141.060	1172	139.800	225.0	140.120	359.9
28	139.780	198.7	139.240	38.30	141.350	1495	141.270	1298	140.340	467.0 *	140.480	608.2 *
29	139.990	298.2	139.210	30.00 *	141.340	1486	141.180	1215	139.940	276.0	139.860	238.3
30	139.980	293.3	139.490	104.1	140.640	785.8	141.590	1764 *	140.230	416.7	140.280	440.0
31			139.310	57.20	141.150	1339			140.340	477.3		
Ten-Daily Mean												
I Ten-Daily	139.482	103.8	139.959	341.5	139.386	75.52	140.828	1024	140.738	864.7	140.521	775.7
II Ten-Daily	139.750	206.3	139.969	413.0	140.225	668.5	140.929	1051	140.255	470.2	140.130	395.9
III Ten-Daily	140.069	374.4	139.400	85.88	140.943	1128	140.952	1136	140.183	413.6	140.265	456.5
Monthly												
Min.	139.300	55.00	139.210	30.00	139.190	29.30	139.620	130.6	139.800	225.0	139.530	118.4
Max.	141.040	1089	141.440	1600	143.280	4325	142.450	2850	141.280	1310	141.540	1678
Mean	139.767	228.2	139.764	273.9	140.209	640.4	140.903	1071	140.385	577.4	140.305	542.7

Annual Runoff in MCM = 16567 Annual Runoff in mm = 228
Peak Observed Discharge = 4325 cumecs on 17/08/2018 Corres. Water Level :143.28 m
Lowest Observed Discharge = 29.30 cumecs on 08/08/2018 Corres. Water Level :139.19 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Mandleshwar for the period 2018-19

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	140.340	429.6	140.580	651.9	140.000	292.1	140.110	294.8	141.300	1404	140.550	621.7
2	140.390	520.0 *	140.710	739.4	140.370	502.6	140.650	664.8	141.450	1558	139.980	238.6 *
3	139.940	274.7	140.560	640.4	140.570	640.0 *	140.750	787.0 *	140.680	716.5	140.400	443.5
4	140.400	545.4	140.670	713.5	140.370	499.7	140.740	775.0 *	140.050	271.4	140.180	321.0
5	140.360	511.2	140.460	554.0	140.470	586.1	140.740	775.1	140.250	364.3	140.370	425.0 *
6	140.470	595.0	140.680	719.0 *	139.840	222.0	140.530	605.0	140.270	373.4	139.760	169.8
7	140.560	662.4	140.320	466.6	140.170	377.6	140.310	400.2	140.200	333.0 *	139.620	132.9
8	140.280	447.6	140.240	430.7	139.720	169.3	140.000	251.1	140.140	305.7	140.110	293.9
9	140.380	525.0 *	140.450	548.1	139.980	283.2	140.110	294.7	140.160	313.3	139.650	143.8
10	140.370	519.2	140.610	670.7	140.640	680.0 *	140.150	311.0 *	139.760	172.7	140.180	321.0
11	140.450	585.6	140.370	503.7	140.320	459.6	140.030	263.4	140.200	335.8	140.600	656.2
12	140.550	656.0	140.180	389.8	140.400	515.9	139.950	214.3	139.950	231.5	140.490	574.0 *
13	140.370	519.1	140.180	390.0 *	140.450	581.2	140.020	258.1	139.900	212.8	140.020	258.2
14	140.260	430.7	140.200	400.0	140.370	510.2	140.120	298.3	140.150	309.0 *	139.700	157.8
15	140.080	339.8	140.400	519.4	139.720	167.6	139.930	219.0	140.380	433.9	139.610	130.6
16	140.180	390.0 *	140.410	525.3	139.530	114.6	140.640	660.0	140.740	769.1	139.700	156.6
17	140.260	430.2	140.000	294.8	139.400	81.00 *	140.790	830.0 *	139.940	227.0 *	139.650	142.6
18	140.420	526.4	140.150	371.0	139.370	73.80	140.430	508.5	139.780	189.4	140.130	301.0 *
19	140.670	776.6	139.950	275.9	139.700	144.3	140.310	398.0	140.310	397.0 *	140.180	320.0 *
20	140.700	798.1	140.310	458.0 *	140.040	295.1	140.740	774.0	140.160	312.9	140.450	517.5
21	140.930	1066	140.080	335.2	139.930	219.7	140.710	740.0 *	140.380	433.0 *	141.330	1441
22	140.800	1003	139.980	287.1	139.960	224.5	140.700	730.4	140.690	723.2	140.540	614.9
23	140.670	788.0 *	139.750	182.9	140.840	881.3	140.820	862.4	140.660	702.2	140.550	621.6
24	140.470	593.7	139.500	109.3	140.650	690.0 *	140.870	920.0 *	140.600	656.7	140.840	875.2
25	140.650	762.0 *	139.610	131.2	139.980	242.8	140.720	752.1	140.570	634.8	139.800	188.8
26	140.520	637.1	139.500	108.0 *	140.120	300.3	141.160	1268	140.800	833.2	140.270	372.0 *
27	140.700	796.4	140.370	503.0 *	140.180	325.3	141.500	1622	140.380	434.7	139.920	224.0
28	140.680	793.2	139.900	254.2	139.900	214.6	141.200	1305	140.280	378.0 *	140.600	655.9
29	140.800	901.4	139.620	135.1			140.800	840.9	139.850	197.5	140.660	701.0
30	140.700	797.0 *	139.880	242.9			141.300	1441	139.620	134.4	139.870	203.1
31	140.740	832.2	140.080	334.5			140.800	840.0 *			139.650	142.7
Ten-Daily Mean												
I Ten-Daily	140.349	503.0	140.528	613.4	140.213	425.3	140.409	515.9	140.426	581.2	140.080	311.1
II Ten-Daily	140.394	545.3	140.215	412.8	139.930	294.3	140.296	442.4	140.151	341.8	140.053	321.5
III Ten-Daily	140.696	815.5	139.843	238.5	140.195	387.3	140.962	1029	140.383	512.8	140.366	549.1
Monthly												
Min.	139.940	274.7	139.500	108.0	139.370	73.80	139.930	214.3	139.620	134.4	139.610	130.6
Max.	140.930	1066	140.710	739.4	140.840	881.3	141.500	1622	141.450	1558	141.330	1441
Mean	140.487	627.5	140.184	415.7	140.107	367.7	140.569	674.3	140.320	478.6	140.173	398.9

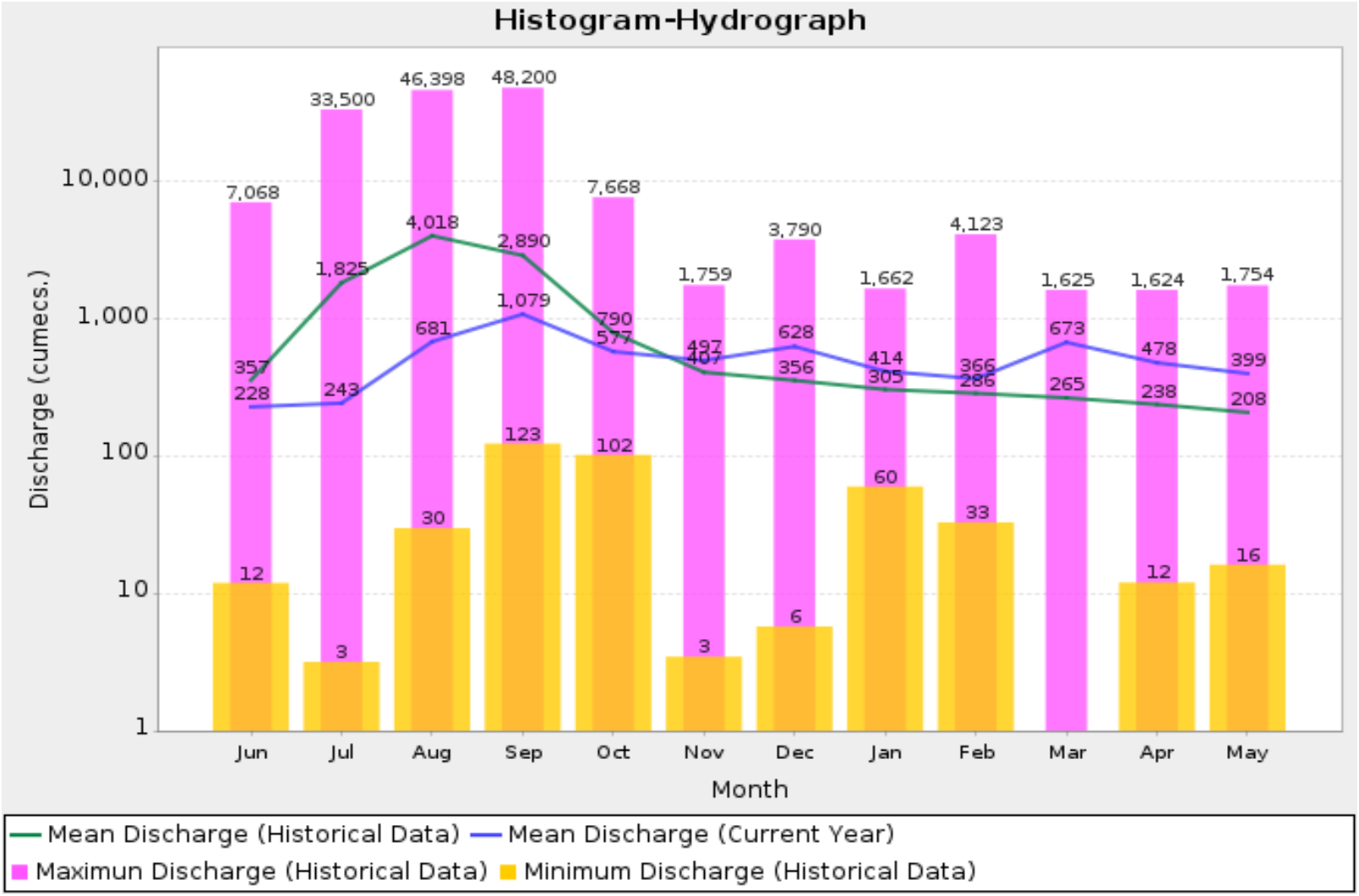
Peak Computed Discharge = 2850 cumecs on 23/09/2018 Corres. Water Level :142.45 m

Lowest Computed Discharge = 30.00 cumecs on 29/07/2018 Corres. Water Level :139.21 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

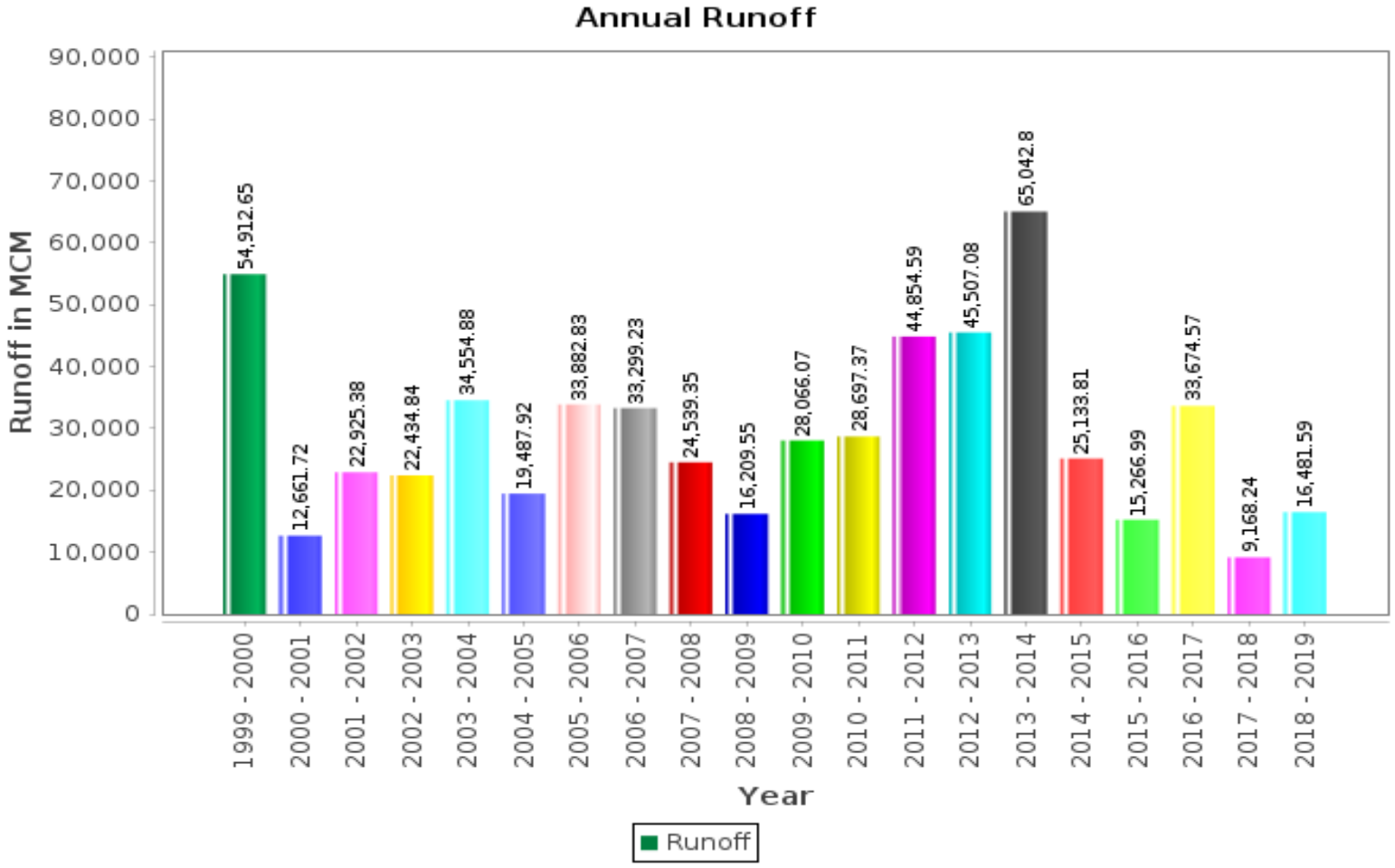
Histogram- Hydrograph for Water Year : 2018-19(Data considered : 1972-2019)



Annual Runoff Values for the period (1972 – 2019)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

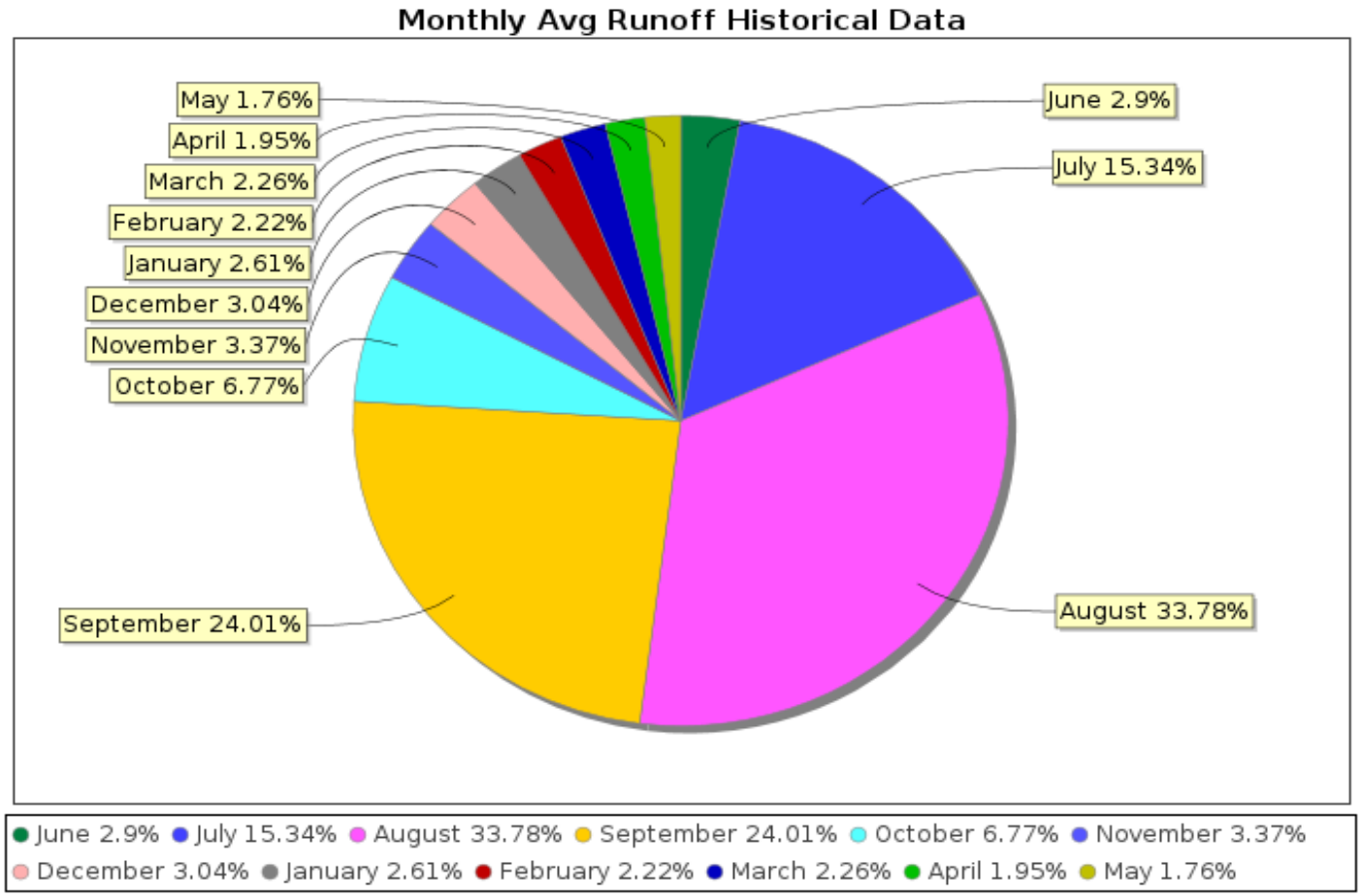
Local River : Narmada Sub-Division :MNSD III, CWC Indore



Monthly Average Runoff based on period (1972 – 2019)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

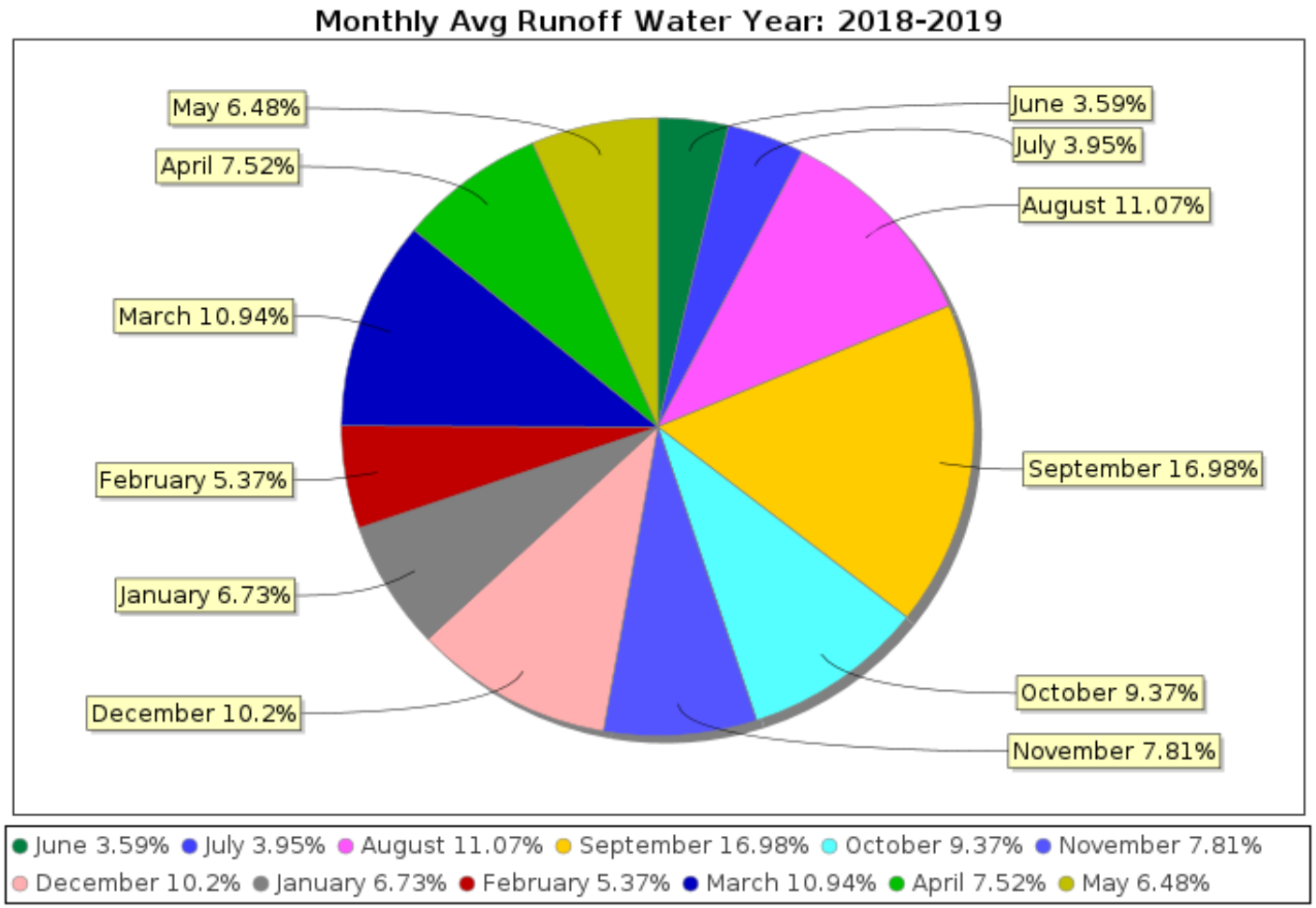
Local River : Narmada Sub-Division :MNSD III, CWC Indore



Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

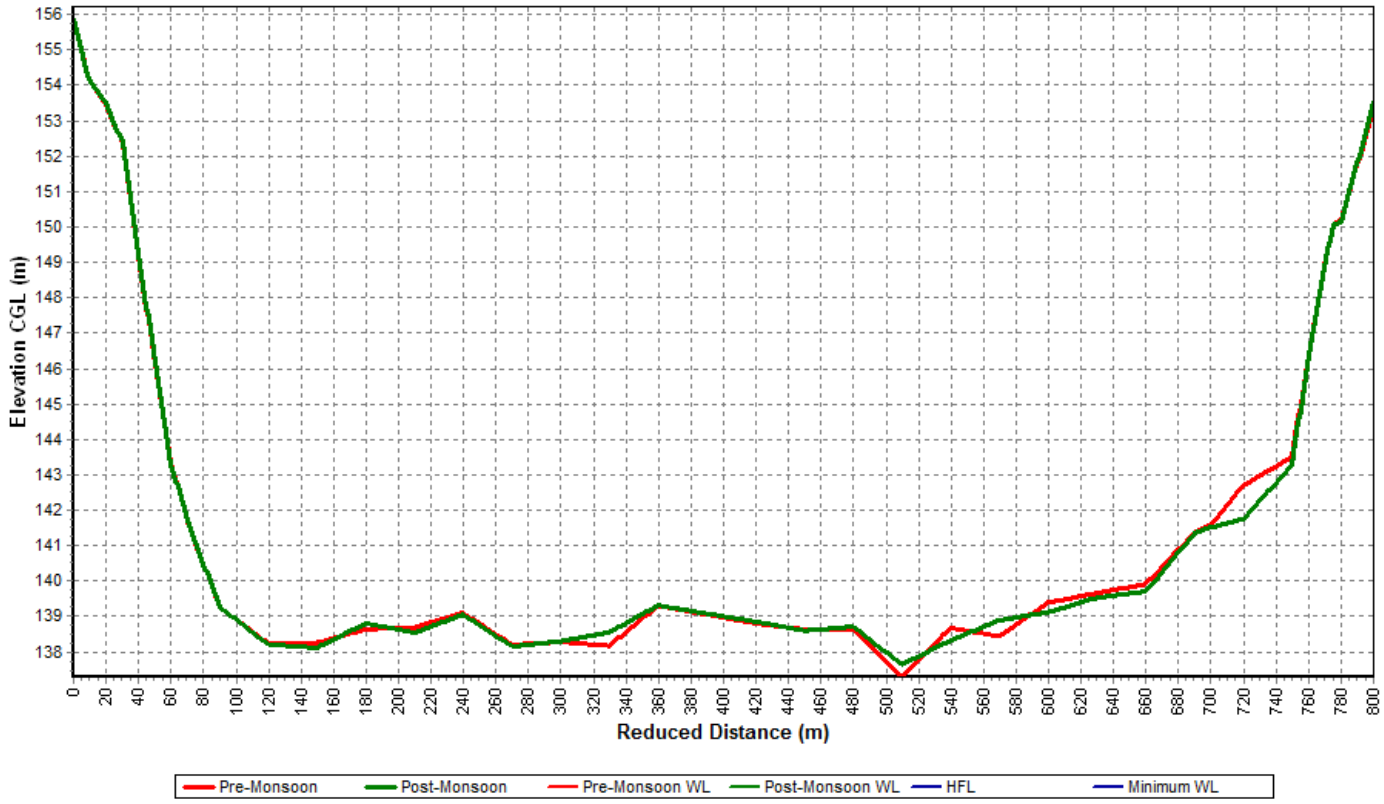
Local River : Narmada Sub-Division :MNSD III, CWC Indore



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

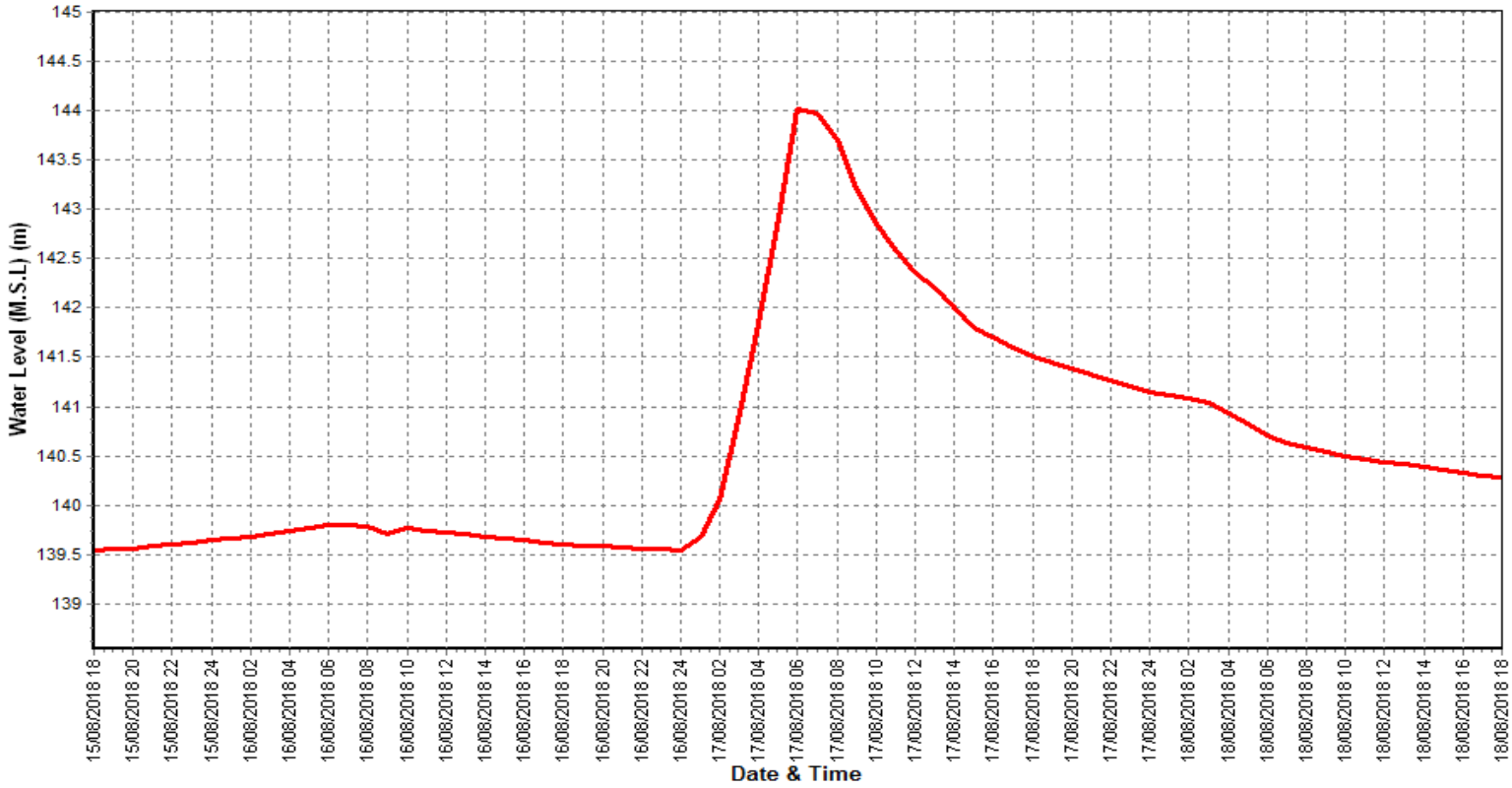
Local River : Narmada Sub-Division :MNSD III, CWC Indore



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD III, CWC Indore

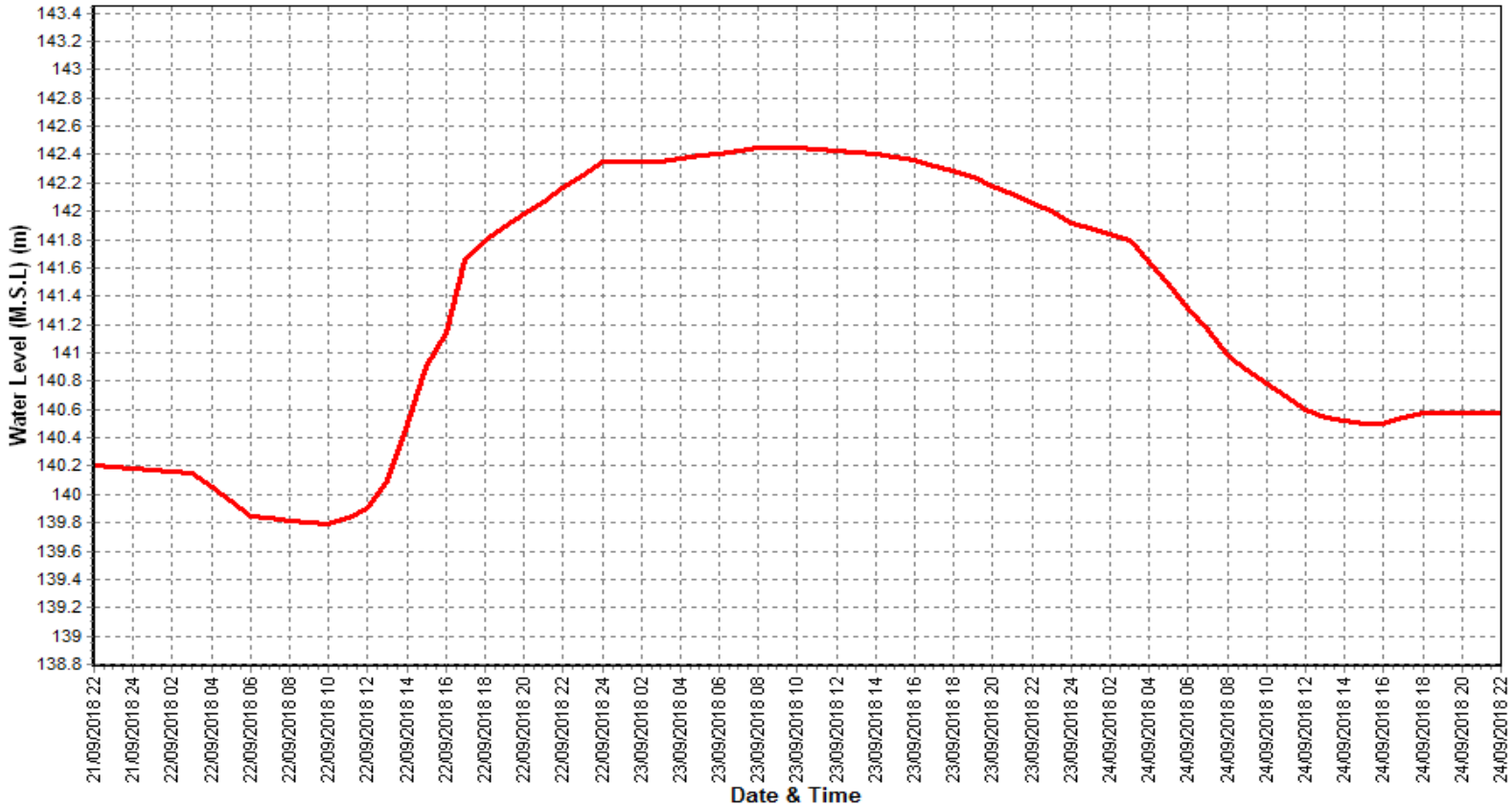


Water

Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Mandleshwar (010215026) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD III, CWC Indore



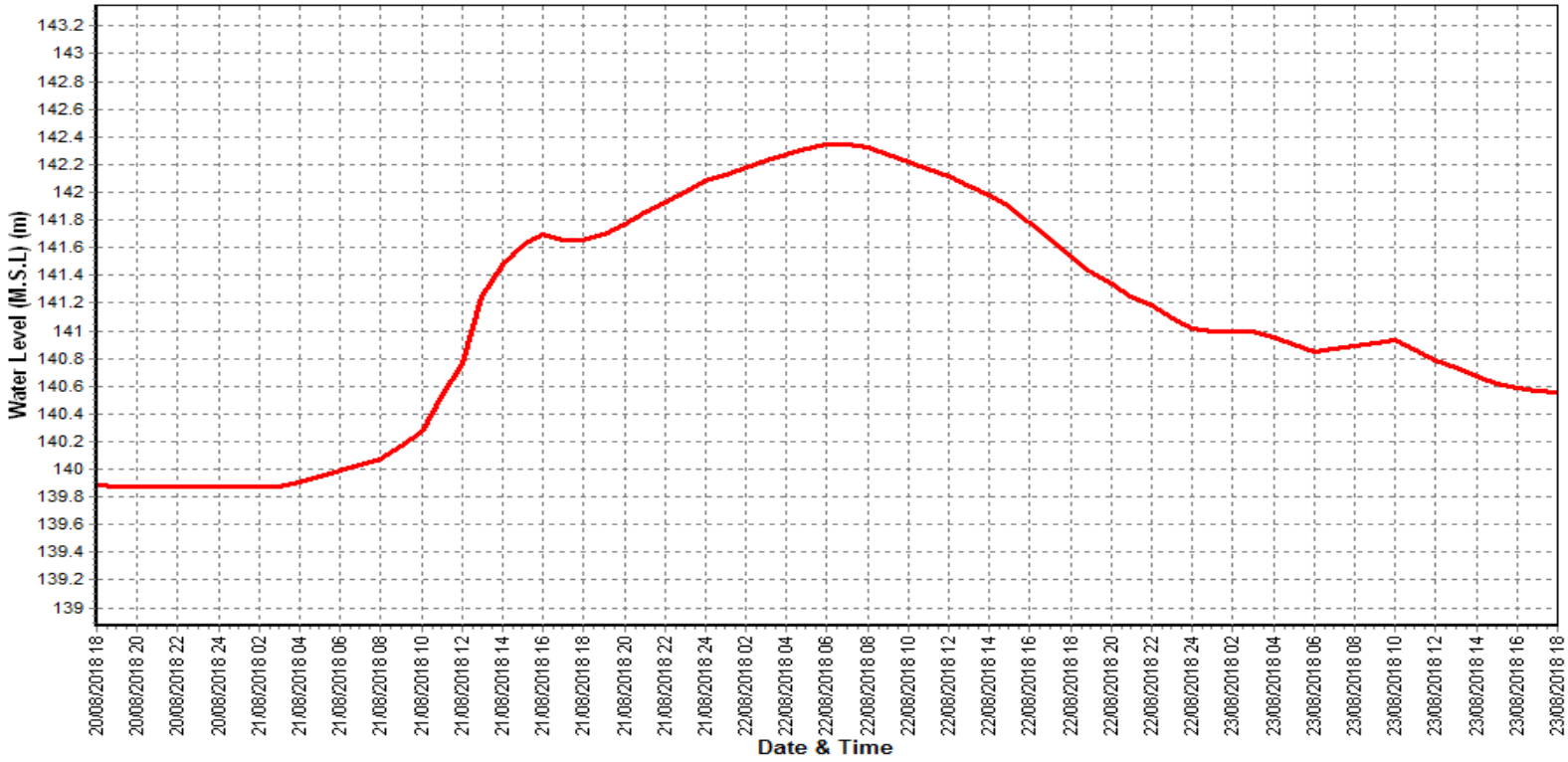
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

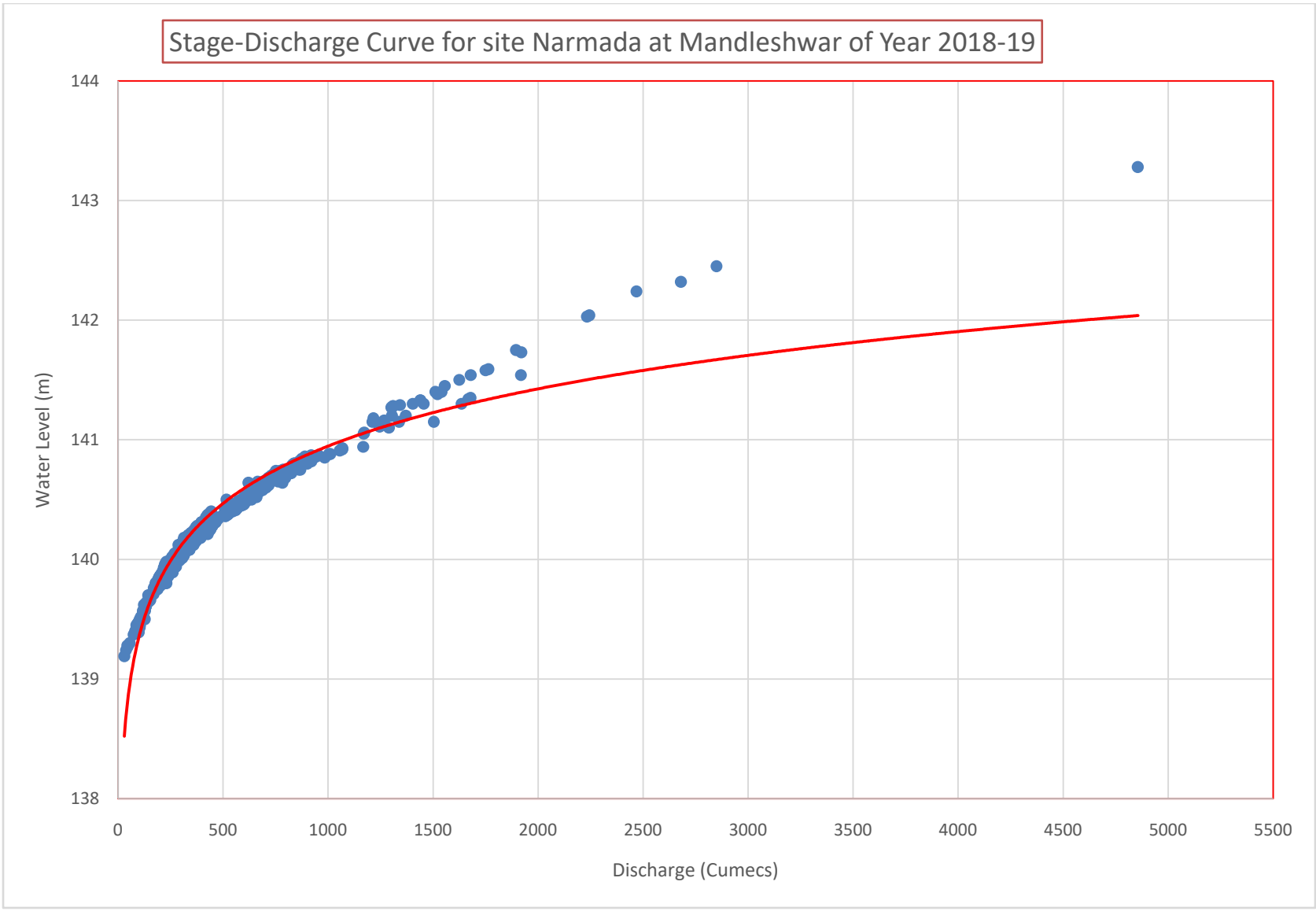
Station Name : Narmada at Mandleshwar (010215026)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division :MNSD III, CWC Indore




Stage-Discharge Curve for site Narmada at Mandleshwar of Year 2018-19
Water Level (m)
144
143
142
141
140
139
138
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
Discharge (Cumecs)

4.4 Kundi at Kogaon

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	kogaon	**Code**	:	007-NDBHP
State	:	Madhya Pradesh	**District**	:	Khargone
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Kundi	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Kundi
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-III, Indore
Drainage Area	:	3919.0 Sq. Km.	**Bank**	:	
Latitude	:	22°6'5''	**Longitude**	:	75°41'1''
Current Zero of Gauge (m)	:	151			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
151.0	05/01/2017	-
151.0	30/10/2015	05/01/2017
151.0	03/02/1978	30/10/2015

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	0	0	20/05/1972	0	0	20/05/1972
1972-1973	2835.8	227.728	01/07/1972	2.1	219.65	15/08/1972
1973-1974	0	0	30/08/1973	0	0	30/08/1973
1978-1979	1437	156.89	29/08/1978	0	0	06/06/1978
1979-1980	2700	161.1	26/06/1979	0	152.64	05/06/1979
1980-1981	600	155.32	22/06/1980	0	152.585	29/05/1981
1981-1982	2550	160.77	16/08/1981	0	152.545	13/06/1981
1982-1983	396	154.66	15/08/1982	0	152.61	30/01/1983
1983-1984	1135	159	15/09/1983	0	152.4	07/06/1983
1984-1985	1250	158.48	10/08/1984	0.1	152.52	06/06/1984
1985-1986	1520	156.35	09/10/1985	0	152.505	26/02/1986
1986-1987	1600	156.96	15/08/1986	0	0	12/06/1986
1987-1988	3034	157.63	21/08/1987	0	152.435	03/06/1987
1988-1989	3500	158.35	03/10/1988	0	0	03/06/1988
1989-1990	4960	159.9	17/08/1989	0	0	03/06/1989
1990-1991	8300	161.55	23/08/1990	0	152.59	11/06/1990
1991-1992	2090	159.7	30/07/1991	0	151	05/06/1991
1992-1993	650.9	157.4	22/06/1992	0	152.585	05/06/1992
1993-1994	1015	157.76	16/07/1993	0	0	12/06/1993
1994-1995	5500	161.85	31/08/1994	0	0	03/06/1994
1995-1996	2005	157.1	29/06/1995	0	152.395	03/06/1995
1996-1997	1520	156.35	16/09/1996	0	152.5	27/06/1996
1997-1998	3800	159.4	23/08/1997	0	152.28	14/06/1997
1998-1999	5600	161.1	22/09/1998	0	151	14/06/1998
1999-2000	1185	156.1	20/06/1999	0	151.38	09/01/2000
2000-2001	1450	155.1	30/06/2000	0	151.8	02/06/2000
2001-2002	725	155.06	18/06/2001	0	152.3	03/06/2001
2002-2003	5900	161.85	03/09/2002	0.05	152.08	30/11/2002
2003-2004	3500	158.76	02/07/2003	0	151.3	15/02/2004
2004-2005	3600	158.65	05/08/2004	0	0	24/01/2005
2005-2006	124.84	153.95	02/08/2005	0	0	17/06/2005
2006-2007	4021.28	158.75	07/08/2006	0	0	12/06/2006
2007-2008	1255.14	156.7	01/07/2007	0	0	12/06/2007
2008-2009	226.55	153.96	11/09/2008	0	152.23	18/06/2008
2009-2010	657.47	155.37	03/09/2009	0	0	21/06/2009

2010-2011	3463.63	159.15	09/09/2010	0	0	01/01/2011
2011-2012	990.91	155.69	29/08/2011	0	0	24/06/2011
2012-2013	1457.52	156.325	06/09/2012	0	152.49	26/11/2012
2013-2014	1314.3	156	04/07/2013	0	0	01/06/2013
2014-2015	3753.29	160.2	08/09/2014	0	0	01/06/2014
2015-2016	1274.15	156.05	06/08/2015	1.77	152.58	17/10/2015
2016-2017	720	155.2	18/09/2016	1.77	152.58	02/07/2016
2017-2018	1579.2	152.5	13/07/2017	0	152.53	20/02/2018
2018-2019	2370	158	17/08/2018	0	153.06	01/03/2019

Stage Discharge Sheet for Kundi at Kogaon for the period 2018-19

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	0.000	0.000	152.740	7.900 *	152.670	4.797	153.490	106.2	153.050	24.30	152.900	0.0
2	0.000	0.000	152.710	5.689	152.660	5.149	153.550	120.0 *	153.050	24.00 *	152.800	0.0
3	0.000	0.000	152.700	5.581	152.660	5.132	153.490	105.3	152.990	18.81	152.700	0.0
4	0.000	0.000	152.670	5.279	152.640	5.054	153.370	103.8	152.910	13.81	152.690	0.0
5	0.000	0.000	152.610	3.832	152.630	5.000 *	153.380	106.4	152.860	10.70	152.680	.0.0
6	0.000	0.000	152.560	2.620	152.610	4.112	153.370	104.6	152.840	8.456	152.670	0.0
7	152.100	0.000	152.560	2.620	152.590	3.083	153.280	75.88	152.820	5.000 *	152.660	0.0
8	152.450	0.000	152.600	3.800 *	152.580	2.111	153.280	75.01	152.910	13.82	152.800	0.0
9	152.760	8.344	152.820	12.81	152.580	2.076	153.320	80.00 *	152.960	17.31	152.830	0.0
10	152.760	8.300 *	152.750	10.80	152.580	2.050	153.280	74.84	152.910	13.76	152.820	0.0
11	152.680	4.898	152.740	9.284	152.580	2.099	153.220	60.73	152.810	7.886	152.750	0.0
12	152.700	4.985	153.625	161.0	152.580	2.000 *	153.120	32.65	152.850	9.466	152.680	0.0
13	152.680	4.887	153.280	85.95	152.580	2.106	153.070	25.00 *	152.850	9.503	152.650	0.0
14	152.680	4.893	153.050	34.36	152.560	1.034	153.040	21.45	152.850	9.000 *	152.640	0.0
15	152.830	12.14	152.850	16.50 *	152.550	0.500 *	152.980	17.96	152.810	7.845	152.630	0.0
16	152.760	8.300 *	152.820	12.92	152.560	1.046	152.940	15.00 *	152.820	8.066	152.620	0.0
17	152.680	4.850 *	152.820	12.96	158.000	2370 *	152.940	18.40	152.820	8.072	152.700	0.0
18	152.700	5.021	152.780	11.84	153.900	173.4	152.910	13.69	152.810	7.875	152.790	0.0
19	153.240	91.32	152.760	9.365	153.580	160.0 *	153.050	24.32	152.810	7.800 *	152.780	0.0
20	153.160	42.34	152.720	5.937	153.570	155.2	152.940	16.02	152.830	8.179	152.800	0.0
21	153.040	32.90	152.710	5.546	153.620	157.7	152.890	11.50 *	152.830	8.000 *	152.790	0.0
22	153.160	41.98	152.710	5.500 *	155.000	750.0 *	152.940	17.54	152.700	3.383	152.780	0.0
23	153.160	41.58	152.700	5.573	154.210	318.5	153.880	180.0 *	152.700	3.414	152.770	0.0
24	153.100	38.00 *	152.700	5.514	154.210	300.2	153.410	106.6	152.700	2.815	152.760	0.0
25	153.030	31.72	152.710	5.545	154.070	228.6	153.280	74.93	152.680	1.830	152.750	0.0
26	153.030	31.86	152.720	5.945	153.970	210.0 *	153.240	59.97	152.670	1.612	152.740	0.0
27	152.850	16.81	152.720	7.702	153.620	155.4	153.200	43.78	152.650	1.826	152.730	0.0
28	152.850	16.79	152.710	7.359	153.710	160.4	153.130	35.94	152.640	1.500 *	152.650	0.0
29	152.830	13.61	152.710	7.000 *	153.720	164.2	153.130	35.77	152.700	2.723	152.610	0.0
30	152.830	13.66	152.690	5.515	153.590	135.2	153.100	30.00 *	152.800	7.992	152.600	0.0
31			152.680	5.404	153.490	107.2			152.870	11.54		
Ten-Daily Mean												
I Ten-Daily	61.007	8.322	152.672	6.093	152.620	3.856	153.381	95.20	152.930	15.00	152.755	
II Ten-Daily	152.811	18.36	152.945	36.01	153.446	286.7	153.021	24.52	152.826	8.369	152.704	
III Ten-Daily	152.988	27.89	152.705	6.055	153.928	244.3	153.220	59.60	152.722	4.240	152.718	
Monthly												
Min.	0.000	4.850	152.560	2.620	152.550	0.500	152.890	11.50	152.640	1.500	152.600	
Max.	153.240	91.32	153.625	161.0	158.000	2370	153.880	180.0	153.050	24.30	152.900	
Mean	122.269	21.78	152.772	15.73	153.351	180.4	153.207	59.78	152.823	9.042	152.726	

Annual Runoff in MCM = 782 Annual Runoff in mm = 200

Peak Observed Discharge = 318.5 cumecs on 23/08/2018 Corres. Water Level :154.21 m

Lowest Observed Discharge = 1.034 cumecs on 14/08/2018 Corres. Water Level :152.56 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Kundi at Kogaon for the period 2018-19

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	152.570	0.0	153.000	0.0	152.910	0.0	153.060	0.0	152.830	12.53	152.440	0.0
2	152.560	0.0	152.980	0.0	152.900	0.0	153.040	0.0	152.820	11.87	152.430	0.0
3	152.550	0.0	152.970	0.0	152.890	0.0	153.030	0.0	152.760	9.010	152.440	0.0
4	152.540	0.0	152.960	0.0	152.890	0.0	153.020	0.0	152.790	9.500	152.430	0.0
5	152.530	.0.0	152.970	.0.0	152.900	.0.0	153.020	.0.0	152.600	2.470	152.440	.0.0
6	152.520	0.0	152.980	0.0	152.950	0.0	153.010	0.0	152.530	0.0	152.520	0.0
7	152.510	0.0	152.990	0.0	152.950	0.0	153.020	0.0	152.510	0.0	152.530	0.0
8	152.500	0.0	153.000	0.0	152.960	0.0	153.050	0.0	152.480	0.0	152.520	0.0
9	152.490	0.0	152.980	0.0	152.960	0.0	153.110	0.0	152.450	0.0	152.520	0.0
10	152.480	0.0	152.970	0.0	152.900	0.0	153.090	0.0	152.430	.0.0	152.530	0.0
11	152.480	0.0	152.980	0.0	152.850	0.0	153.090	29.40	152.400	0.0	152.530	0.0
12	152.480	0.0	152.980	0.0	153.000	0.0	153.100	29.48	152.390	0.0	152.520	0.0
13	152.480	0.0	152.980	0.0	152.950	0.0	153.150	41.14	152.380	0.0	152.510	0.0
14	152.480	0.0	152.970	0.0	152.950	0.0	153.140	38.80	152.360	0.0	152.490	0.0
15	152.470	0.0	152.960	0.0	153.000	0.0	153.130	35.34	152.340	0.0	152.470	0.0
16	152.480	0.0	152.980	0.0	152.980	0.0	152.960	29.58	152.330	0.0	152.440	0.0
17	152.480	0.0	152.990	0.0	152.970	0.0	152.950	25.40 *	152.320	0.0	152.430	0.0
18	152.640	0.0	152.990	0.0	152.960	0.0	152.940	17.68	152.610	3.8	152.420	0.0
19	152.940	0.0	153.000	0.0	152.960	0.0	152.910	13.08	152.580	0.0	152.400	0.0
20	152.940	0.0	153.000	0.0	153.010	0.0	152.910	13.01	152.540	0.0	152.480	0.0
21	152.840	0.0	152.990	0.0	153.000	0.0	152.900	12.91 *	152.520	0.0	152.510	0.0
22	152.970	0.0	152.980	0.0	152.980	0.0	152.900	12.87	152.500	0.0	152.440	0.0
23	152.900	0.0	152.970	0.0	152.970	0.0	152.810	5.090	152.470	0.0	152.350	0.0
24	152.800	0.0	152.960	0.0	152.960	0.0	152.810	5.100 *	152.470	0.0	152.340	0.0
25	152.940	0.0	152.950	0.0	152.950	0.0	152.530	0.0	152.470	0.0	152.110	0.0
26	152.970	0.0	152.950	0.0	152.500	0.0	152.530	0.0	152.480	0.0	0.0	0.0
27	152.980	0.0	152.940	0.0	152.149	0.0	152.520	0.0	152.480	0.0	0.0	0.0
28	152.960	0.0	152.930	0.0	152.930	0.0	152.530	5.110	152.480	0.0	0.0	0.0
29	153.000	0.0	152.920	0.0		0.0	152.830	12.46	152.440	0.0	152.780	9.240
30	152.970	0.0	152.880	0.0		0.0	152.850	13.32	152.430	0.0	152.820	5.190
31	152.970		152.910				152.800	9.170 *		0.0	152.730	3.030
Ten-Daily Mean												
I Ten-Daily	152.525		152.980		152.921		153.045		152.620	9.076	152.480	
II Ten-Daily	152.587		152.983		152.963		153.028	27.29	152.425	3.850	152.469	
III Ten-Daily	152.936		152.944		152.805		152.728	9.504	152.474		152.510	5.820
Monthly												
Min.	152.470		152.880		152.149		152.520	5.090	152.320	2.470	152.110	3.030
Max.	153.000		153.000		153.010		153.150	41.14	152.830	12.53	152.820	9.240
Mean	152.691		152.968		152.903		152.927	19.39	152.506	8.205	152.485	5.82

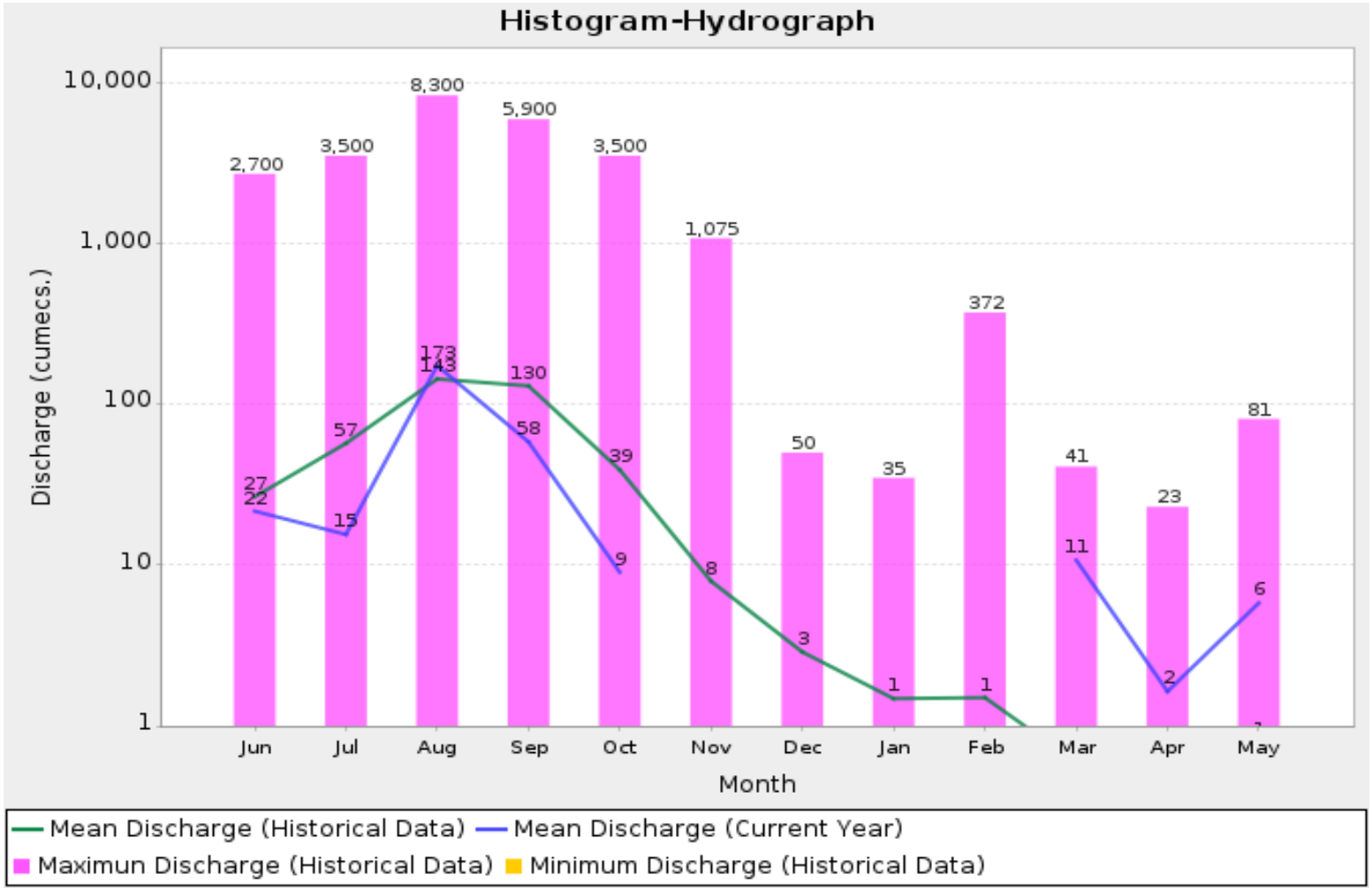
Peak Computed Discharge = 2370 cumecs on 17/08/2018 Corres. Water Level :158 m
Lowest Computed Discharge = 0.500 cumecs on 15/08/2018 Corres. Water Level :152.55 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1978-2019)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

Local River : Kundi Sub-Division :MNSD III, CWC Indore



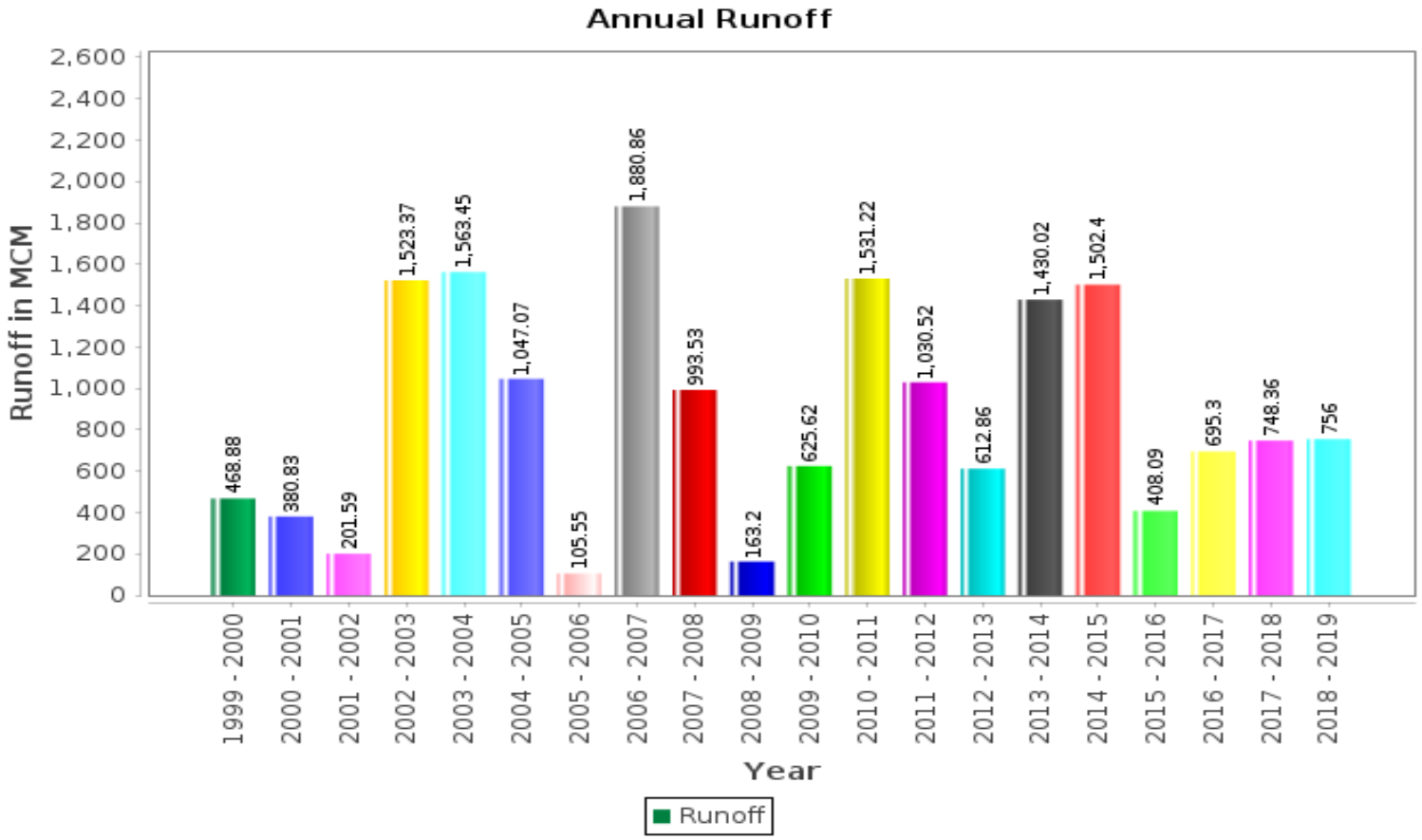
Annual Runoff Values for the period (1978 – 2019)

Station Name : Kundi at Kogaon (010215025)

Division : Narmada Division, Bhopal

Local River : Kundi

Sub-Division :MNSD III, CWC Indore

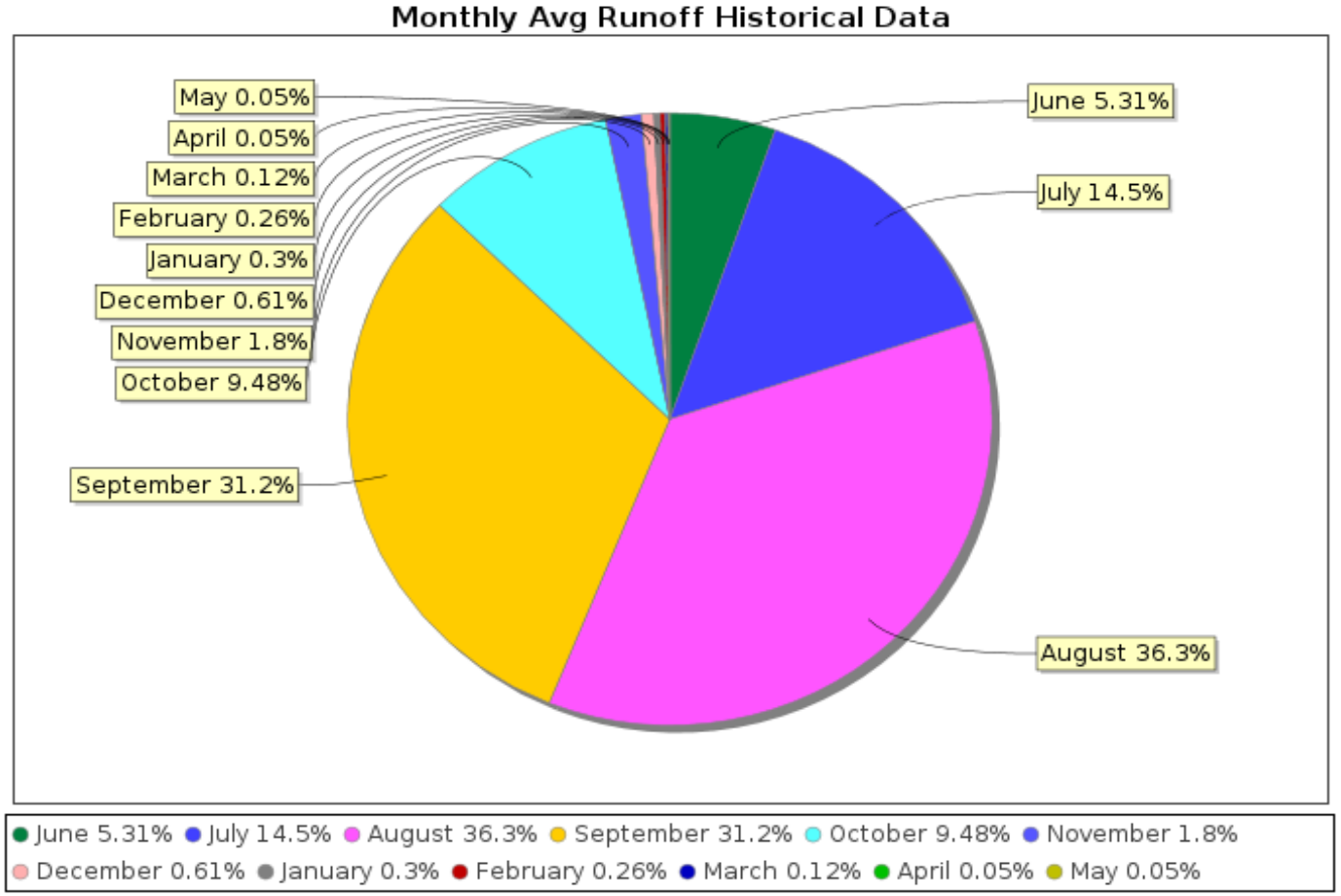


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1978 – 2019)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

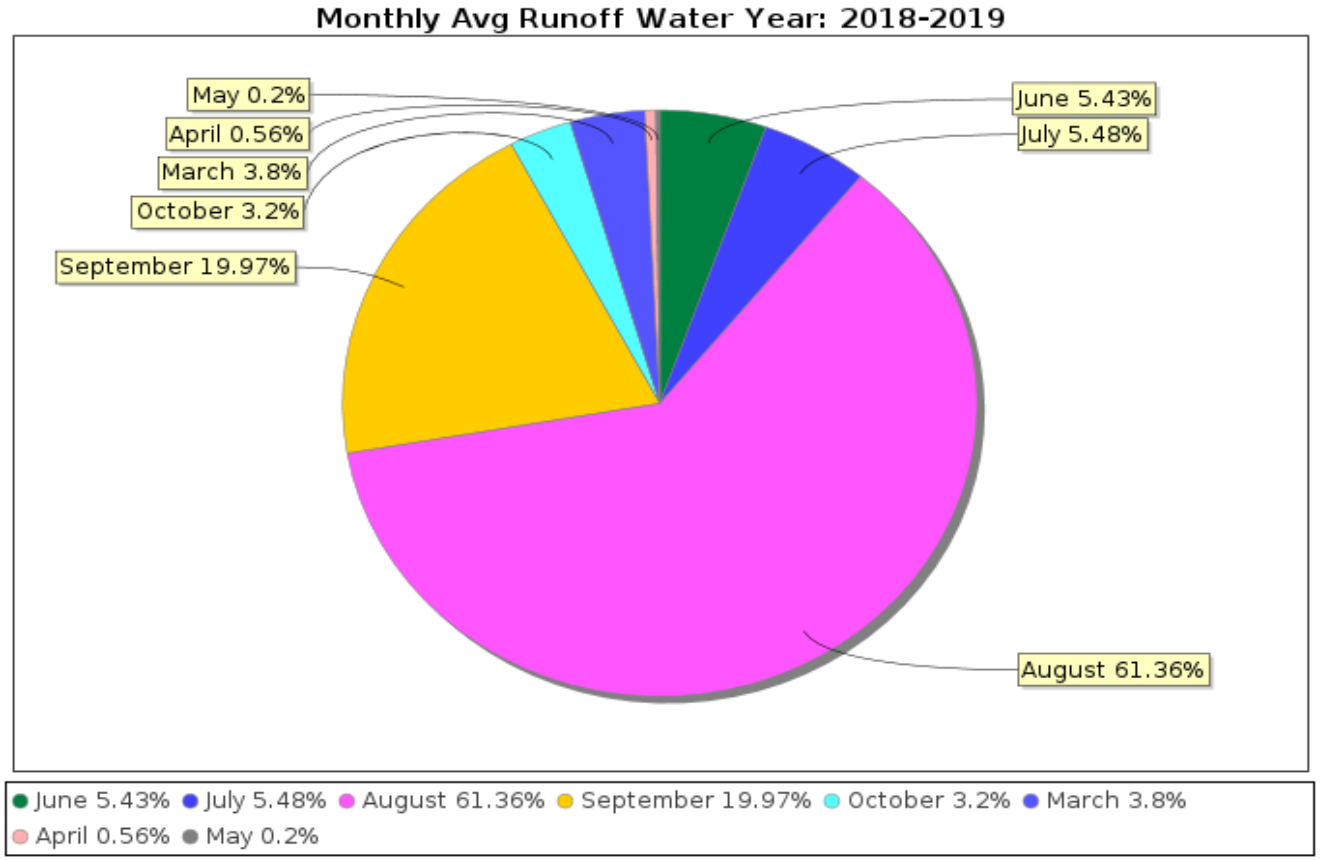
Local River : Kundi Sub-Division :MNSD III, CWC Indore



Monthly Runoff for the Year (2018-19)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

Local River : Kundi Sub-Division :MNSD III, CWC Indore



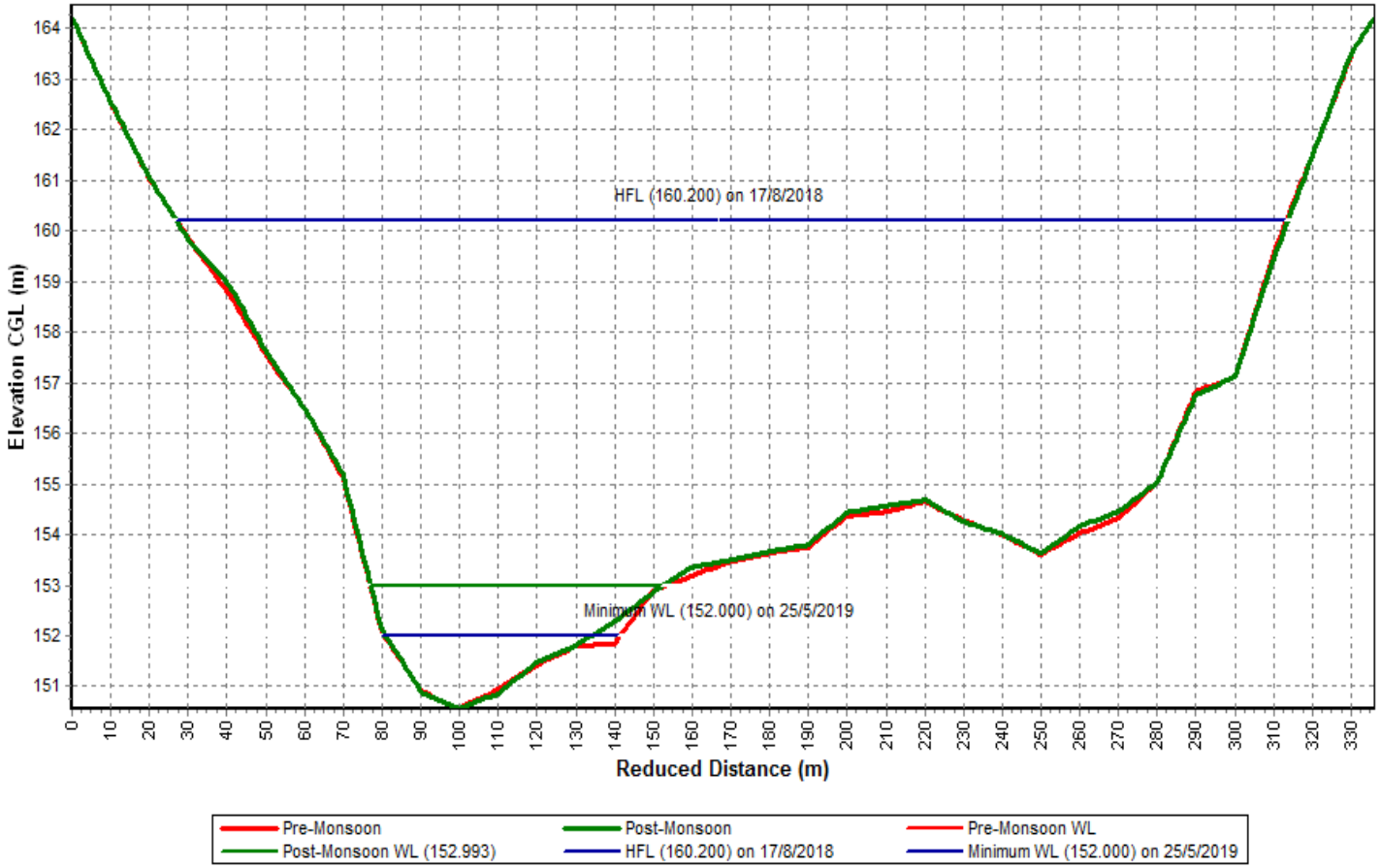
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Kundi at Kogaon (010215025)

Division : Narmada Division, Bhopal

Local River : Kundi

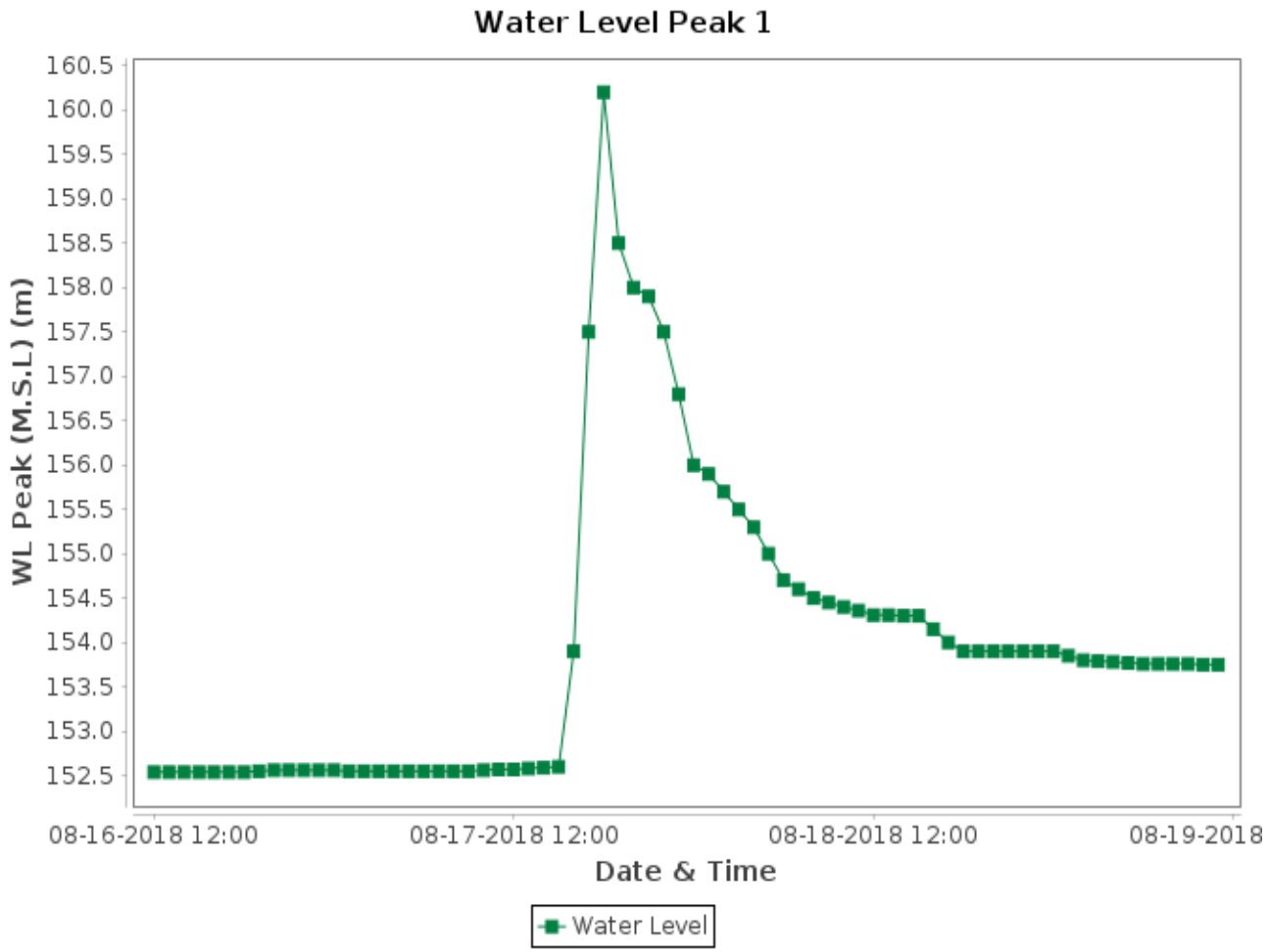
Sub-Division : MNSD III CWC Indore



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

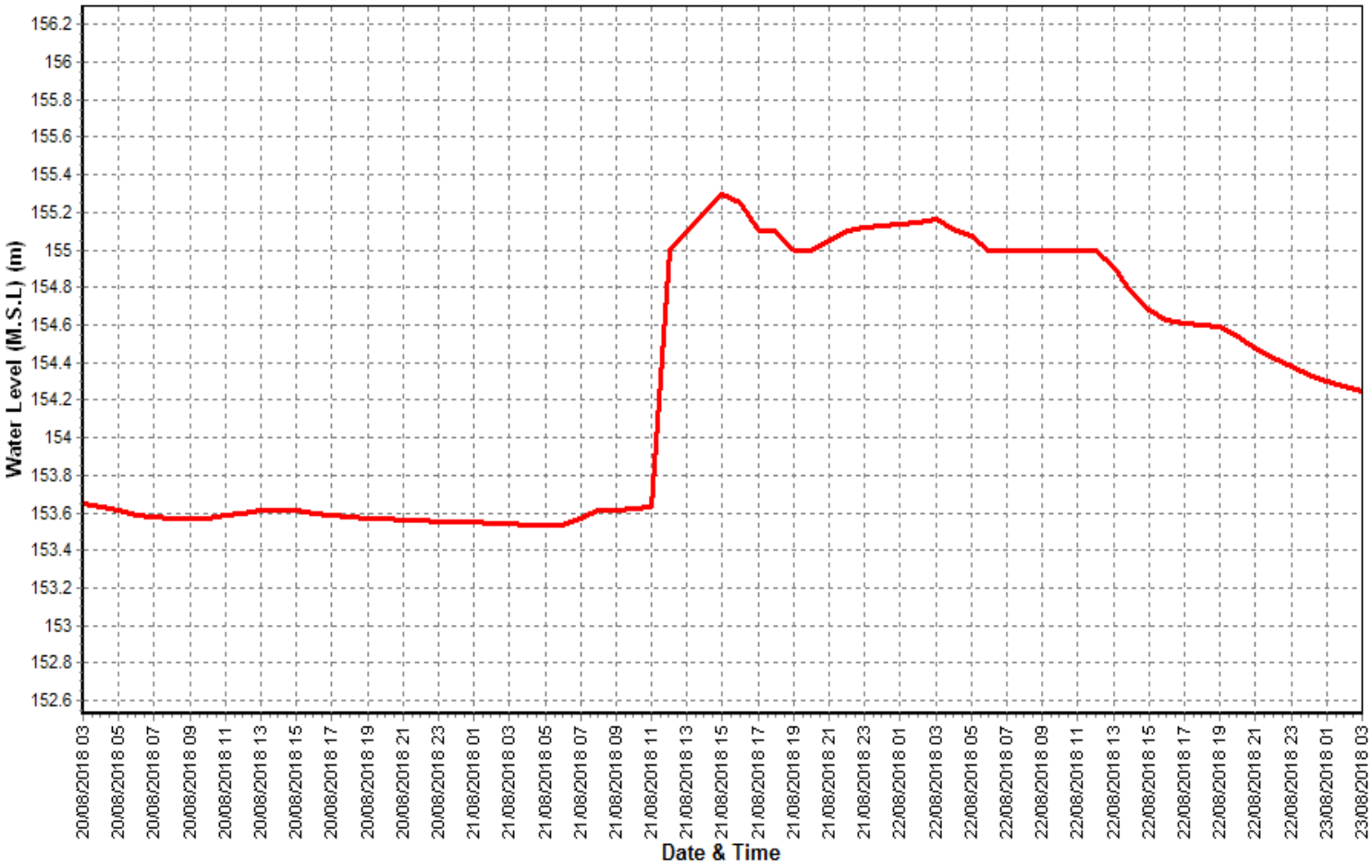
Local River : Kundi Sub-Division :MNSD III, CWC Indore



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

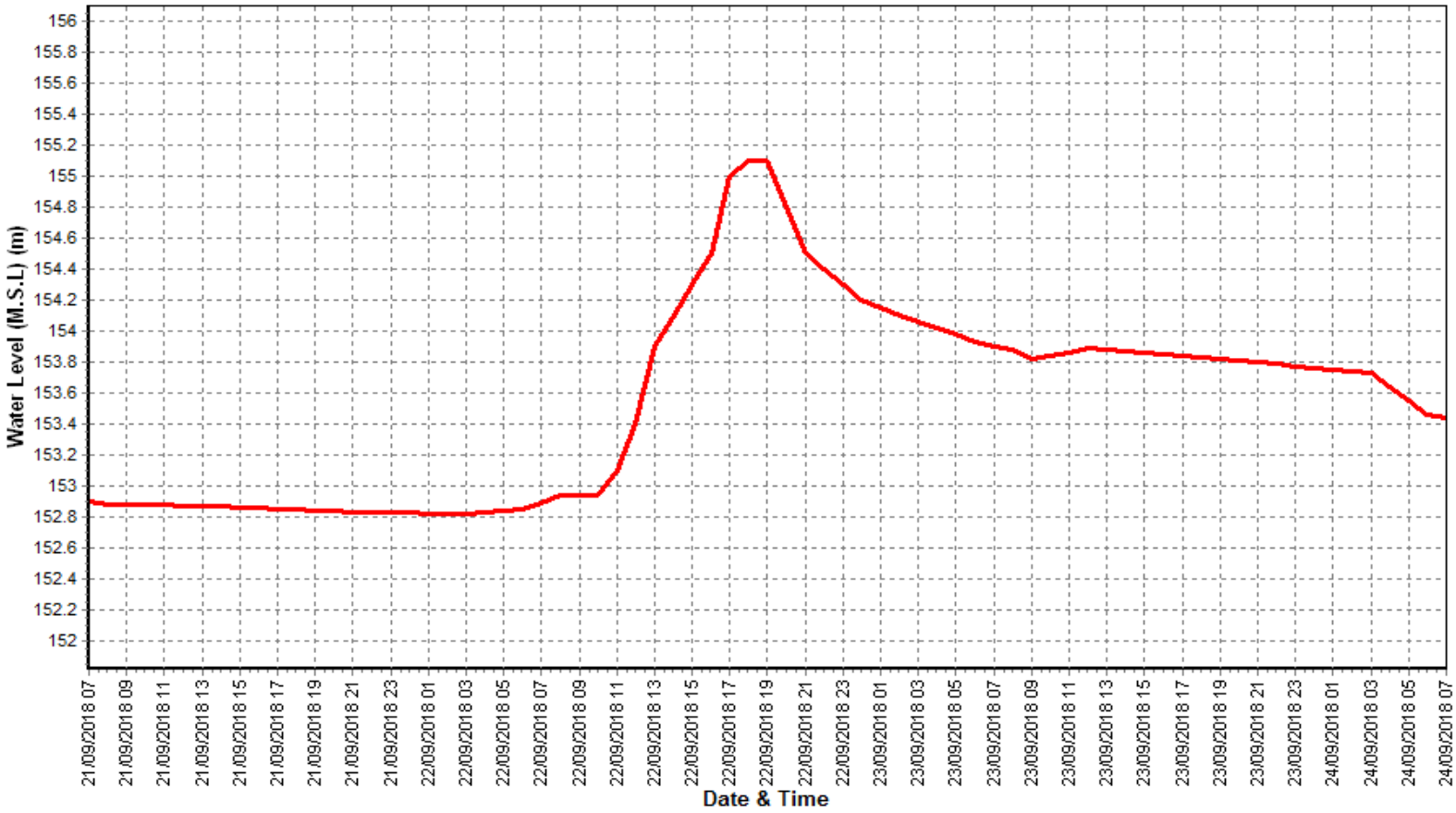
Local River : Kundi Sub-Division :MNSD III, CWC Indore

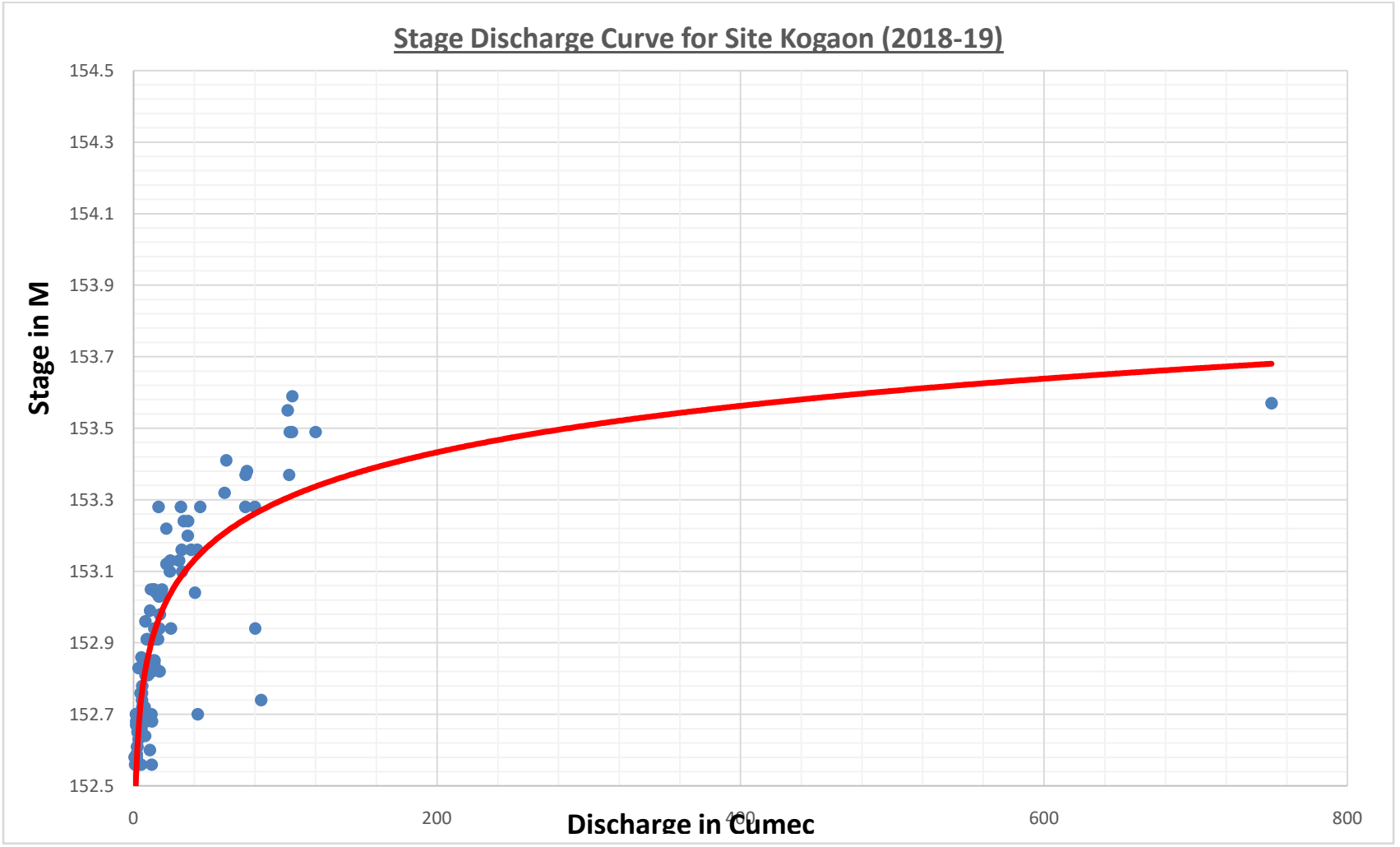


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Kundi at Kogaon (010215025) Division : Narmada Division, Bhopal

Local River : Kundi Sub-Division :MNSD III, CWC Indore




Stage Discharge Curve for Site Kogaon (2018-19)
Stage in M
154.5
154.3
154.1
153.9
153.7
153.5
153.3
153.1
152.9
152.7
152.5
0
200
400
600
800
Discharge in Cumec

4.5 Narmada at Handia

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Handia	**Code**	:	014-NDBHP
State	:	Madhya Pradesh	**District**	:	Harda
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-II, Bhopal
Drainage Area	:	54027.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°29'24''	**Longitude**	:	76°59'36''
Current Zero of Gauge (m)	:	0			

CATEGORY		Opening Date	Closing Date
Gauge	:	09/02/1977	
Discharge	:	26/04/1977	
Sediment	:	11/12/1977	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
258.0	05/01/2017	31/12/2018
258.0	01/01/2019	31/12/2019
0.0	19/02/2019	-
258.0	30/06/2016	31/12/2017
258.0	09/02/1977	14/10/2016
258.0	14/10/2016	05/01/2017

1976-1977	36.6	259.045	05/05/1977	18.5	258.985	20/05/1977
1977-1978	11000	269	15/09/1977	17.4	258.985	02/06/1977
1978-1979	19220	269.74	17/08/1978	33.6	259.24	07/06/1978
1979-1980	14350	268.48	11/08/1979	16.5	260.445	25/05/1980
1980-1981	20157.3	271.555	30/08/1980	20	260.54	01/06/1980
1981-1982	10199.2	267.545	10/08/1981	25.8	260.585	15/06/1981
1982-1983	17060	270.25	23/08/1982	30	260.57	12/06/1982
1983-1984	19950	270.76	10/09/1983	31.3	260.595	30/05/1984
1984-1985	26240	273.58	19/08/1984	23	260.555	26/05/1985
1985-1986	15600	269.74	09/08/1985	29.4	260.54	26/05/1986
1986-1987	23060	272.58	24/07/1986	28.8	260.54	16/06/1986
1987-1988	13661	269.83	28/08/1987	18.47	260.45	29/06/1987
1988-1989	20500	271.6	06/08/1988	12.12	260.44	30/05/1989
1989-1990	13200	268.52	08/08/1989	11.96	260.44	01/06/1989
1990-1991	18000	270.31	23/08/1990	37.66	260.68	12/06/1990
1991-1992	20780	270.685	26/08/1991	57.05	260.71	15/05/1992
1992-1993	9800	267.68	14/09/1992	53.2	260.695	17/03/1993
1993-1994	12300	269.15	06/08/1993	45.2	260.6	12/06/1993
1994-1995	24040	271.75	06/09/1994	100.8	261.035	22/01/1995
1995-1996	10200	267.88	12/08/1995	70.5	260.8	26/05/1996
1996-1997	14300	269.82	27/07/1996	45	260.73	23/06/1996
1997-1998	15000	270.22	26/07/1997	47.4	260.7	14/06/1997
1998-1999	18500	271.56	15/09/1998	65.2	260.68	29/05/1999
1999-2000	29250	272.78	20/09/1999	66	260.85	20/05/2000
2000-2001	5450	266.18	30/07/2000	99.01	260.95	07/06/2000
2001-2002	5950	266.5	16/08/2001	114	260.69	06/04/2002
2002-2003	14800	269.65	19/08/2002	60.41	260.76	30/05/2003
2003-2004	13240	270.08	28/07/2003	60	260.76	01/06/2003
2004-2005	14625	271	23/08/2004	53.5	260.85	23/05/2005
2005-2006	11761.64	268.935	06/07/2005	47.56	260.8	12/06/2005
2006-2007	21341	271.06	15/08/2006	56.52	260.68	29/06/2006
2007-2008	10883.78	268.685	09/07/2007	42.52	260.51	20/05/2008
2008-2009	6246	266.57	03/08/2008	32.41	261.27	01/02/2009
2009-2010	20785.61	271.21	11/09/2009	100.52	260.66	09/04/2010
2010-2011	6586.8	266.66	06/09/2010	77.58	260.76	06/06/2010
2011-2012	8044.14	267.85	24/07/2011	69.25	260.71	27/05/2012
2012-2013	21415	273.16	07/08/2012	45.3	260.61	08/06/2012
2013-2014	31879.9	274.15	24/08/2013	113.76	260.8	18/05/2014

2014-2015	4908.59	266.255	08/09/2014	65.63	261.98	31/08/2014
2015-2016	5371.43	266.625	21/01/2016	72.8	260.7	04/04/2016
2016-2017	14900.8	270.09	13/07/2016	72	260.44	17/05/2017
2017-2018	3059.3	264.385	21/07/2017	20	260.33	04/04/2018
2018-2019	4500	265.37	02/09/2018	16	260.9	08/04/2019

Stage Discharge Sheet for Narmada at Handia for the period 2018-19

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	260.870	92.70	261.010	110.0 *	262.670	948.9	265.180	4151	262.080	534.7	261.260	254.3 *
2	260.810	81.60	260.980	107.0	262.450	800.0 *	265.370	4500 *	262.030	490.0 *	261.240	247.9 *
3	260.850	94.00 *	260.950	100.0	262.180	570.0 *	264.580	3158	261.940	479.3	261.180	221.0 *
4	260.880	97.30	260.990	110.0	261.990	480.0 *	263.990	2350 *	261.980	459.1	261.130	215.0 *
5	260.850	95.00	261.050	112.0 *	261.860	460.0 *	263.700	1850 *	261.970	456.3	261.100	217.1 *
6	260.800	84.30	261.110	120.0 *	261.830	48.00	263.500	1653	261.940	436.1	261.060	210.5 *
7	260.790	87.50	261.500	238.0	261.820	398.0	263.310	1599	261.870	415.0 *	261.030	205.0 *
8	260.850	96.00 *	261.440	230.0 *	261.805	376.0	263.790	1900 *	261.810	397.9	261.100	218.3 *
9	260.980	108.0 *	261.620	307.0	261.750	370.0	263.940	2300 *	261.745	374.5 *	261.100	218.4 *
10	260.980	108.0 *	262.290	691.4	261.770	380.0 *	264.390	3062	261.650	330.0 *	261.070	210.0 *
11	260.950	103.0 *	261.850	337.0	263.830	2011	265.220	4158	261.600	313.5	261.020	200.0 *
12	260.940	97.20	261.820	330.0 *	263.280	1620 *	264.200	2608	261.590	308.5	260.950	166.4 *
13	260.940	96.10	262.700	970.0 *	262.790	1045	263.410	1650 *	261.590	310.0 *	260.900	160.2 *
14	260.960	94.60	261.930	425.0 *	262.490	860.5	263.080	1400 *	261.590	305.0 *	260.850	155.3 *
15	260.940	97.20	261.810	320.0 *	262.370	700.0 *	262.960	1205	261.590	305.0 *	260.800	153.4 *
16	260.900	95.00 *	261.820	450.0	262.240	6360	262.650	900.0 *	261.590	305.0 *	260.800	152.4 *
17	260.860	92.00 *	262.210	567.6	262.260	664.0	262.220	588.3	261.570	300.0 *	260.790	151.7 *
18	260.850	89.80	263.560	1726	262.900	1078	262.095	510.7	261.540	295.0 *	260.810	155.0 *
19	260.840	89.00	263.010	1351	263.200	1550 *	262.030	479.3	261.500	293.0 *	260.850	156.4 *
20	260.860	91.90	263.150	1450	263.240	1580 *	262.985	477.6	261.440	290.0 *	260.900	158.9 *
21	260.980	101.0	263.105	1411 *	263.300	1750 *	261.390	430.0 *	261.390	285.0 *	260.890	160.0 *
22	260.980	106.0	262.760	900.9	264.955	4067	261.950	453.1	261.390	285.0 *	260.850	156.3 *
23	260.870	12.40	262.400	783.7	265.280	4248	262.250	650.0 *	261.370	284.0	260.780	152.0 *
24	260.880	102.0 *	262.360	699.0	264.600	3243	262.225	604.5	261.360	283.0 *	260.780	151.4 *
25	260.880	90.60	262.170	567.0 *	264.140	2494	262.270	659.0	261.340	275.3	260.820	155.0 *
26	260.870	95.90	263.680	1800	263.890	2200 *	262.370	703.6	261.330	272.6	260.830	153.9 *
27	260.910	97.00 *	264.010	2302 *	263.490	1656	262.260	653.8	261.290	264.7	260.900	160.8 *
28	260.960	106.0	263.930	2100 *	263.010	1382	262.230	600.0 *	261.270	260.0 *	261.000	200.0 *
29	260.970	108.0 *	263.510	1700 *	262.715	970.8	262.180	580.4	261.270	256.6	261.160	221.7 *
30	261.010	110.0 *	263.160	1500 *	262.755	1042	262.130	550.0 *	261.270	255.0	261.120	210.0 *
31			263.905	1055	264.490	3167			261.270	254.0		
Ten-Daily Mean												
I Ten-Daily	260.866	94.44	261.294	212.5	262.013	483.1	264.175	2652	261.901	437.3	261.127	221.8
II Ten-Daily	260.904	94.58	262.386	792.7	262.860	1747	263.085	1398	261.560	302.5	260.867	161.0
III Ten-Daily	260.931	92.89	263.181	1347	263.875	2384	262.125	588.4	261.323	270.5	260.913	172.1
Monthly												
Min.	260.790	12.40	260.950	100.0	261.750	48.00	261.390	430.0	261.270	254.0	260.780	151.4
Max.	261.010	110.0	264.010	2302	265.280	6360	265.370	4500	262.080	534.7	261.260	254.3
Mean	260.900	93.97	262.316	802.3	262.947	1565	263.129	1546	261.586	334.6	260.969	184.9

Annual Runoff in MCM = 13788 Annual Runoff in mm = 255

Peak Observed Discharge = 6360 cumecs on 16/08/2018 Corres. Water Level :262.24 m

Lowest Observed Discharge = 12.40 cumecs on 23/06/2018 Corres. Water Level :260.87 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Handia for the period 2018-19

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	261.080	206.8	261.320	265.0 *	0.0	0.0	260.860	160.0 *	260.270	37.30	260.380	43.10
2	261.050	205.0 *	261.300	258.8 *	0.0	0.0	260.900	165.0 *	260.260	35.00 *	260.300	41.30
3	261.010	200.0	261.290	257.9 *	0.0	0.0	260.920	170.0 *	260.260	35.60	260.280	40.00 *
4	261.100	208.6	261.330	264.6 *	0.0	0.0	260.910	167.0 *	260.250	33.50	260.270	35.00 *
5	261.090	205.9	261.320	264.2 *	.0.0	.0.0	260.880	162.0 *	260.240	31.10	260.260	35.00 *
6	261.120	209.2	261.300	260.0 *	0.0	0.0	260.820	149.2	260.350	44.20	260.260	35.00 *
7	261.140	213.6	261.330	264.4 *	0.0	0.0	260.760	140.6	260.420	65.00 *	260.250	34.00 *
8	261.220	240.0 *	261.360	285.6 *	0.0	0.0	260.700	135.0 *	260.900	160.0	260.250	34.00 *
9	261.180	230.0 *	261.370	285.0 *	0.0	0.0	260.670	125.0 *	260.990	172.8	260.250	35.90
10	261.100	211.4	261.350	280.8 *	0.0	0.0	260.600	115.0 *	260.940	162.0	260.240	35.00 *
11	261.060	203.8	261.350	281.9 *	0.0	0.0	260.630	118.9	260.940	162.4	260.240	35.00 *
12	261.080	209.1	261.250	250.0 *	0.0	0.0	260.662	118.6	260.800	145.8	260.240	35.00 *
13	261.180	223.6	261.220	240.0 *	0.0	0.0	260.620	117.2	260.720	125.0 *	260.240	35.00
14	261.160	218.6	261.190	225.0 *	0.0	0.0	260.750	130.0 *	260.690	120.0 *	260.230	33.10
15	261.100	212.9	261.150	217.7 *	0.0	0.0	260.870	150.0 *	260.630	116.7	260.230	32.40
16	261.020	205.0 *	261.140	215.0 *	0.0	0.0	260.850	140.0 *	260.430	80.30	260.230	32.40
17	260.980	193.5	261.130	215.9 *	0.0	0.0	260.840	140.0 *	260.400	65.00 *	260.230	31.50
18	261.020	201.5	261.130	214.1 *	0.0	0.0	260.840	140.6	260.370	55.80	260.230	31.50 *
19	261.050	202.5	261.120	213.8 *	0.0	0.0	260.700	120.4	260.350	49.50	260.230	32.00 *
20	261.060	203.7	261.120	215.0 *	0.0	0.0	260.640	117.0	260.300	43.30	260.260	36.40
21	261.030	201.5	261.140	214.9 *	0.0	0.0	260.610	110.0 *	260.300	45.00 *	260.320	41.80
22	261.040	204.5	261.100	208.8 *	0.0	0.0	260.580	105.0 *	260.420	74.40	260.350	45.10
23	261.070	205.0 *	261.090	205.1 *	0.0	0.0	260.530	100.0 *	260.410	73.50	260.300	38.50
24	261.130	215.0 *	261.080	202.0 *	0.0	0.0	260.500	92.00 *	260.400	70.90	260.300	37.50
25	261.190	220.0 *	261.100	206.9 *	0.0	0.0	260.440	79.60	260.390	68.00	260.290	36.40
26	261.260	255.0 *	261.110	210.0 *	0.0	0.0	260.410	70.70	260.390	64.70	260.290	35.00 *
27	261.320	270.0 *	261.090	210.0 *	0.0	0.0	260.370	60.00 *	260.380	64.00	260.280	35.00 *
28	261.310	275.0	261.090	210.0 *	0.0	0.0	260.330	50.00 *	260.380	60.00 *	260.280	35.00 *
29	261.340	270.0	261.090	204.0 *	0.0	0.0	260.300	42.60	260.370	58.00	260.270	34.00 *
30	261.300	260.0 *	261.080	205.0 *	0.0	0.0			260.350	51.70	260.270	34.50
31	261.300	260.0 *	261.080	201.9 *							260.270	33.90
Ten-Daily Mean												
I Ten-Daily	261.109	213.1	261.327	268.6			260.802	148.9	260.488	77.65	260.274	36.83
II Ten-Daily	261.071	207.4	261.180	228.8			260.740	129.3	260.563	96.38	260.236	33.43
III Ten-Daily	261.208	239.6	261.095	207.1			260.452	78.88	260.379	63.02	260.293	36.97
Monthly												
Min.	260.980	193.5	261.080	201.9			260.300	42.60	260.240	31.10	260.230	31.50
Max.	261.340	275.0	261.370	285.6			260.920	170.0	260.990	172.8	260.380	45.10
Mean	261.132	220.7	261.197	234			260.672	120.4	260.477	79.02	260.268	35.78

Peak Computed Discharge = 4500 cumecs on 02/09/2018 Corres. Water Level :265.37 m

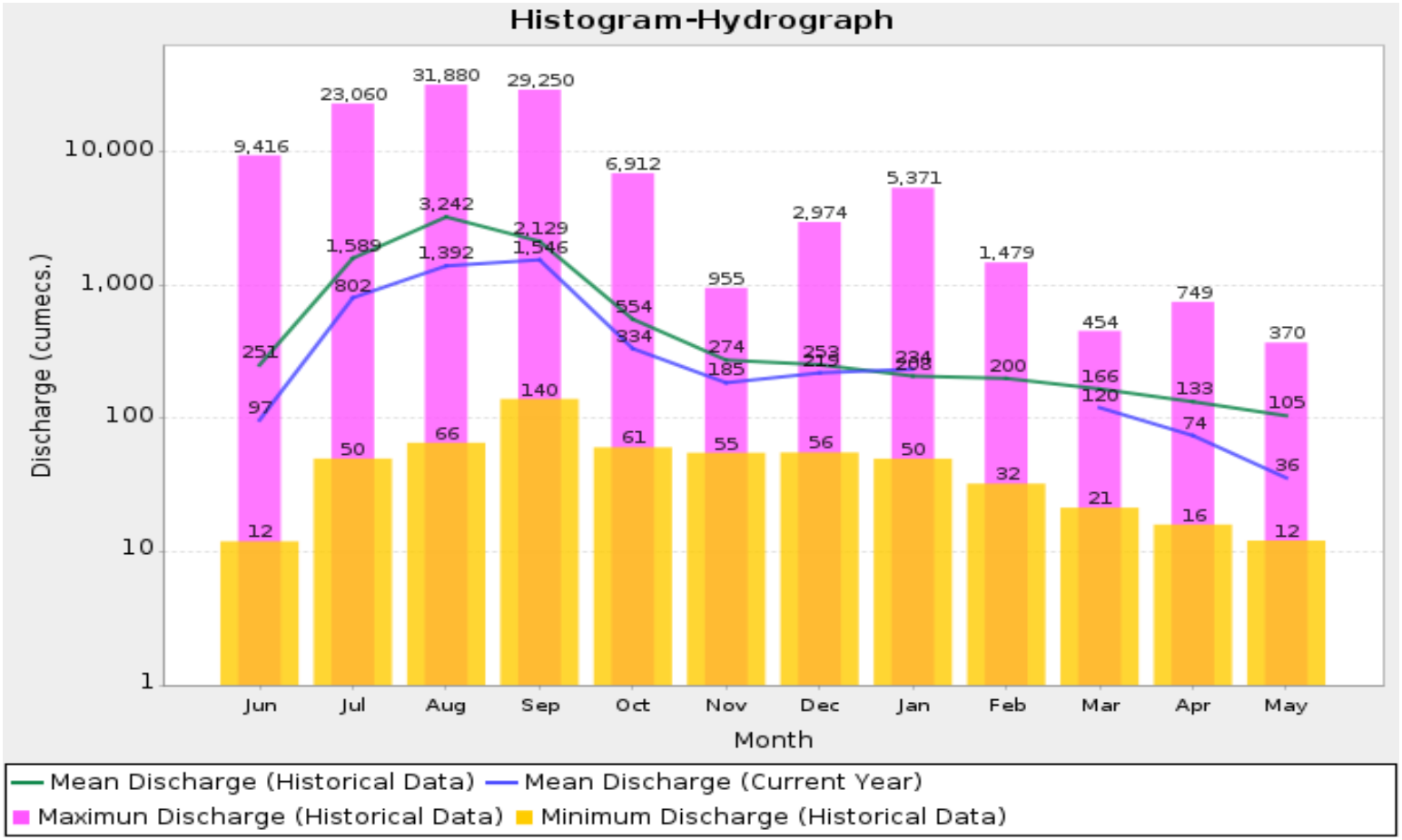
Lowest Computed Discharge = 31.50 cumecs on 18/05/2019 Corres. Water Level :260.23 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1977-2019)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

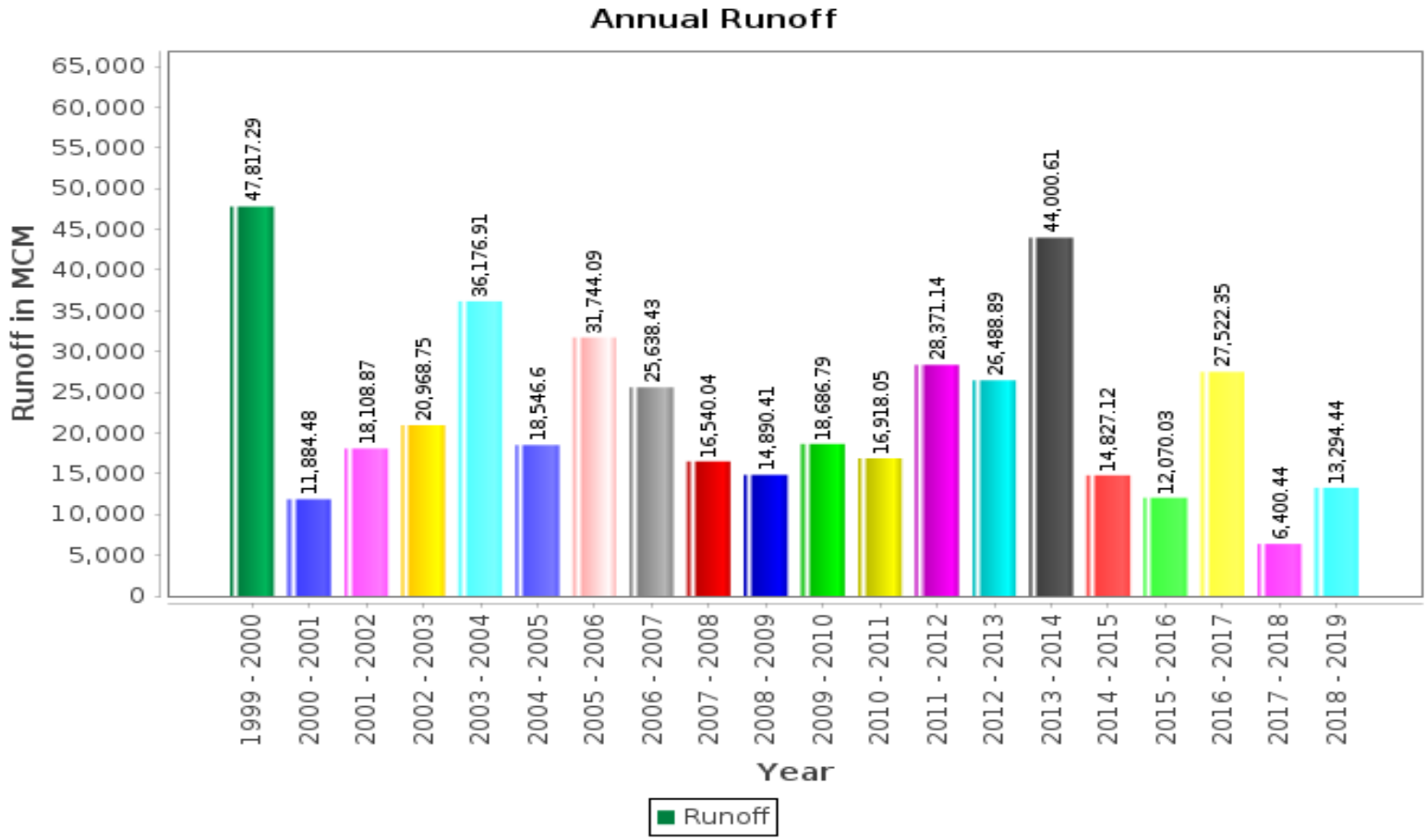
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



Annual Runoff Values for the period (1977 – 2019)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD II, CWC Bhopal

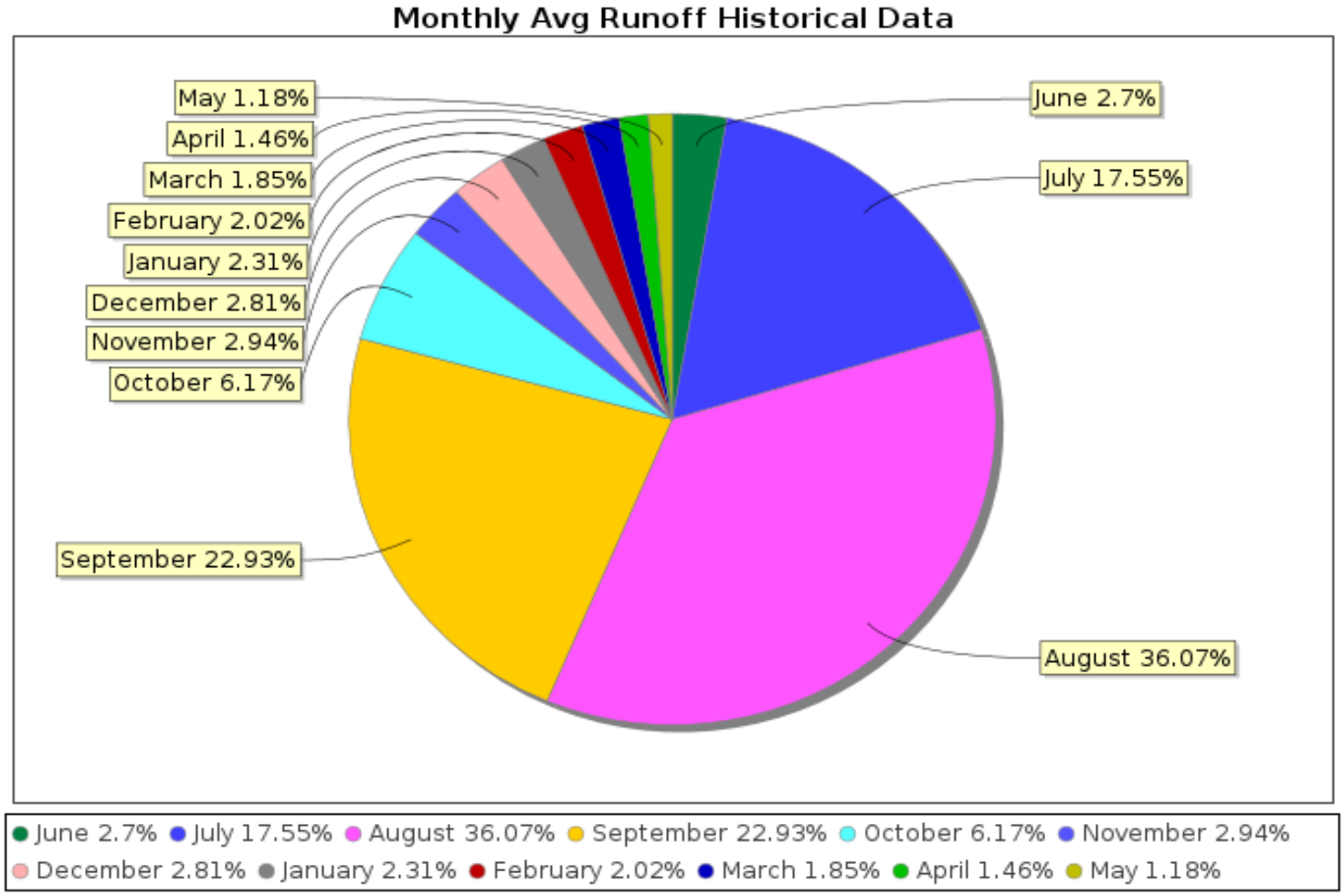


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977 – 2019)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

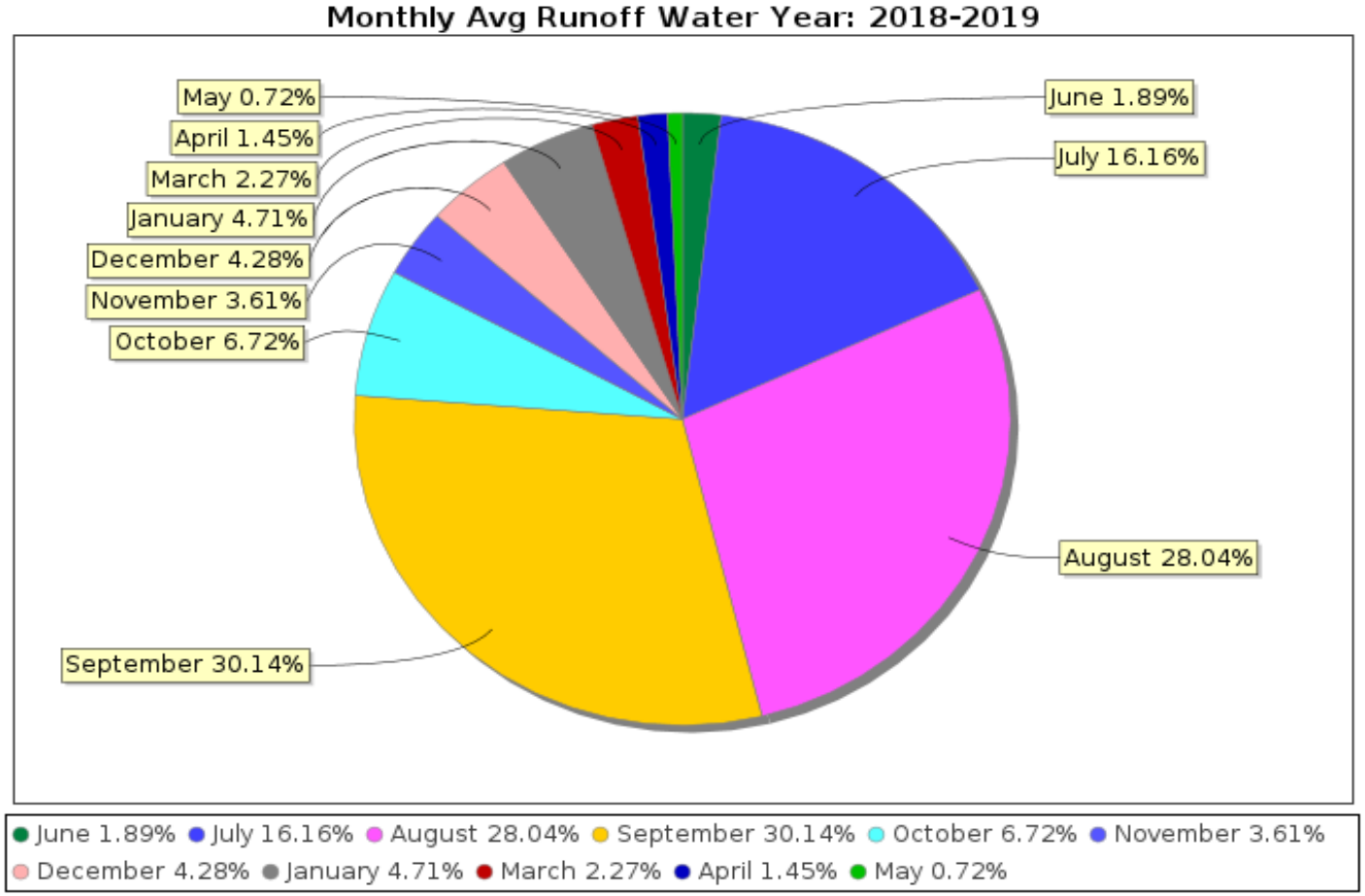
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



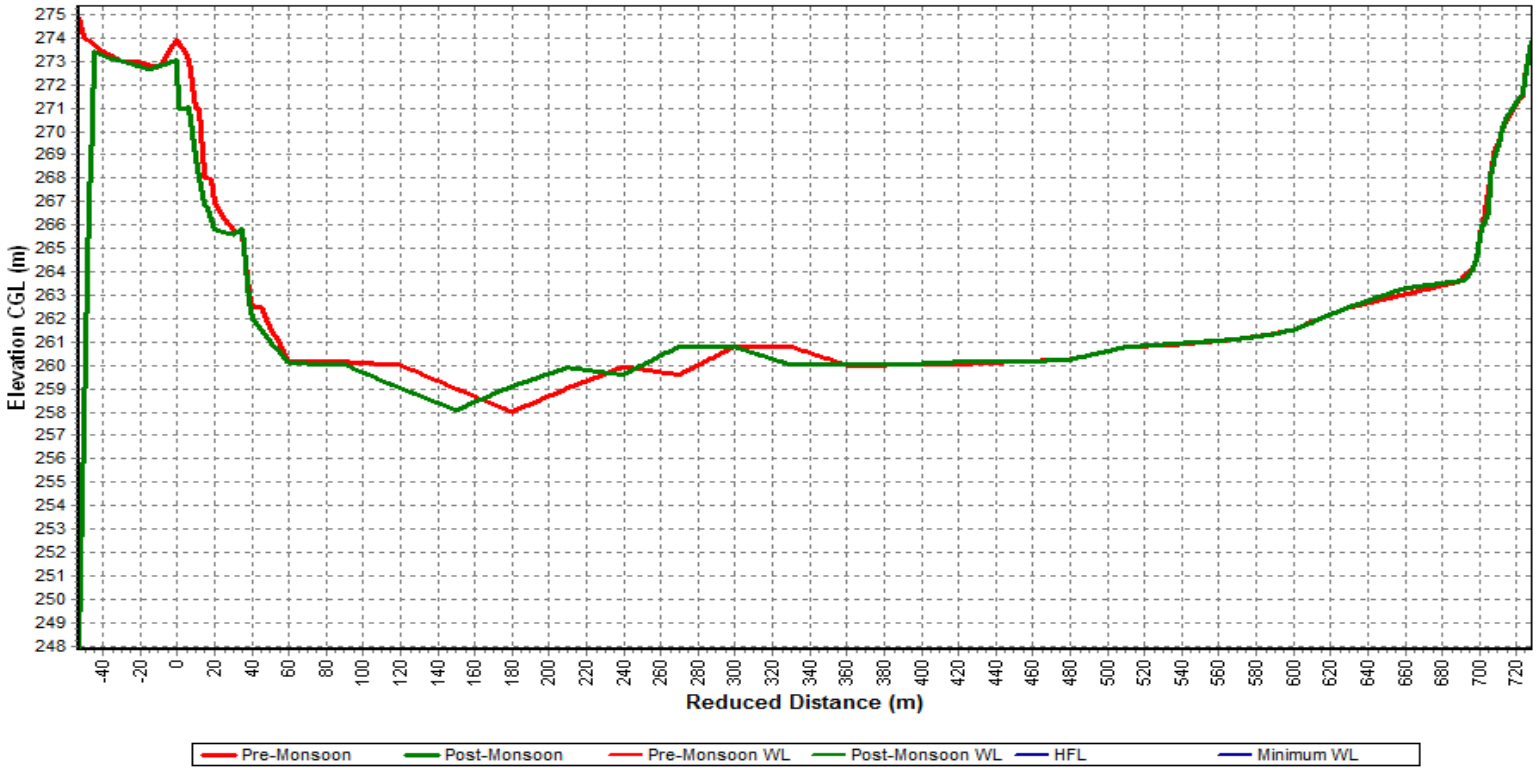
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Handia (010215022)

Division : Narmada Division, Bhopal

Local River : Narmada

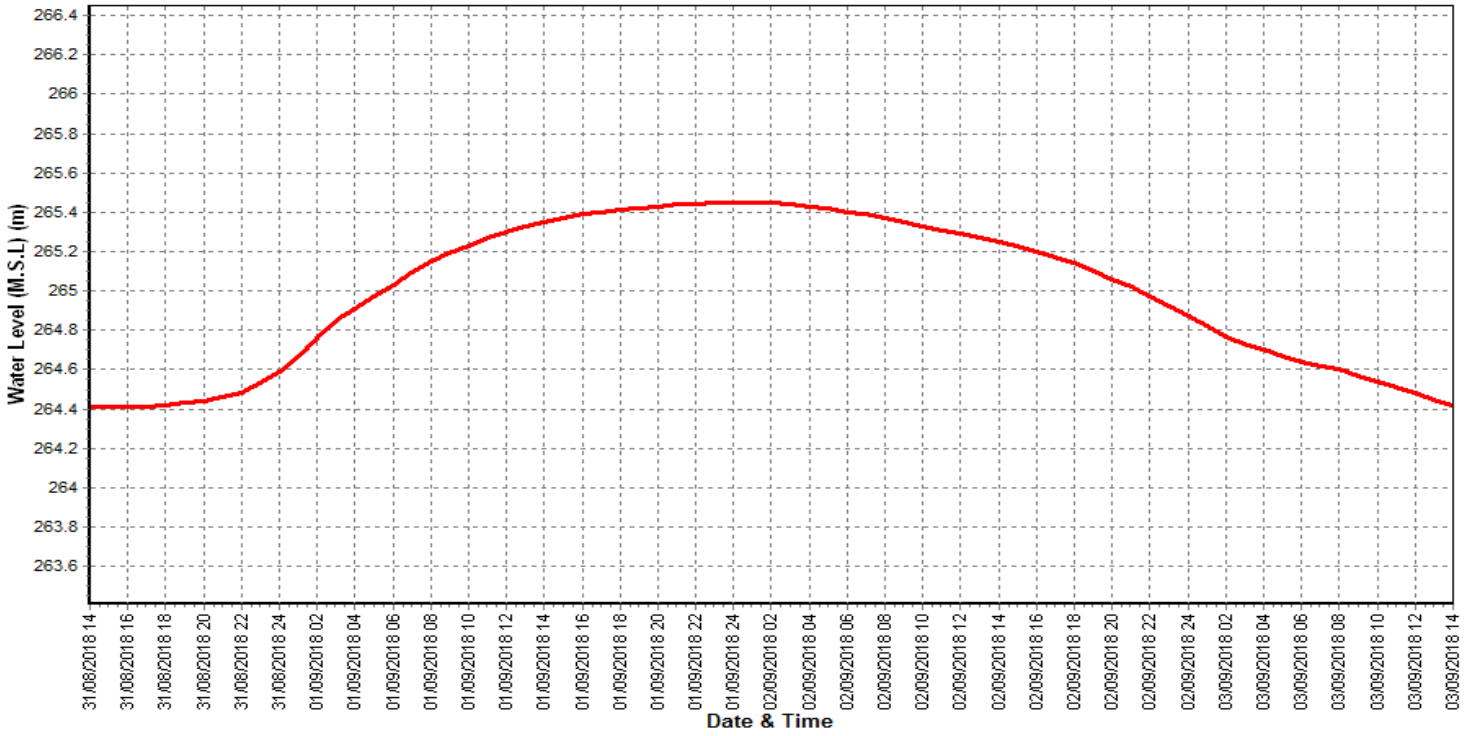
Sub-Division :MNSD II, CWC Bhopal



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

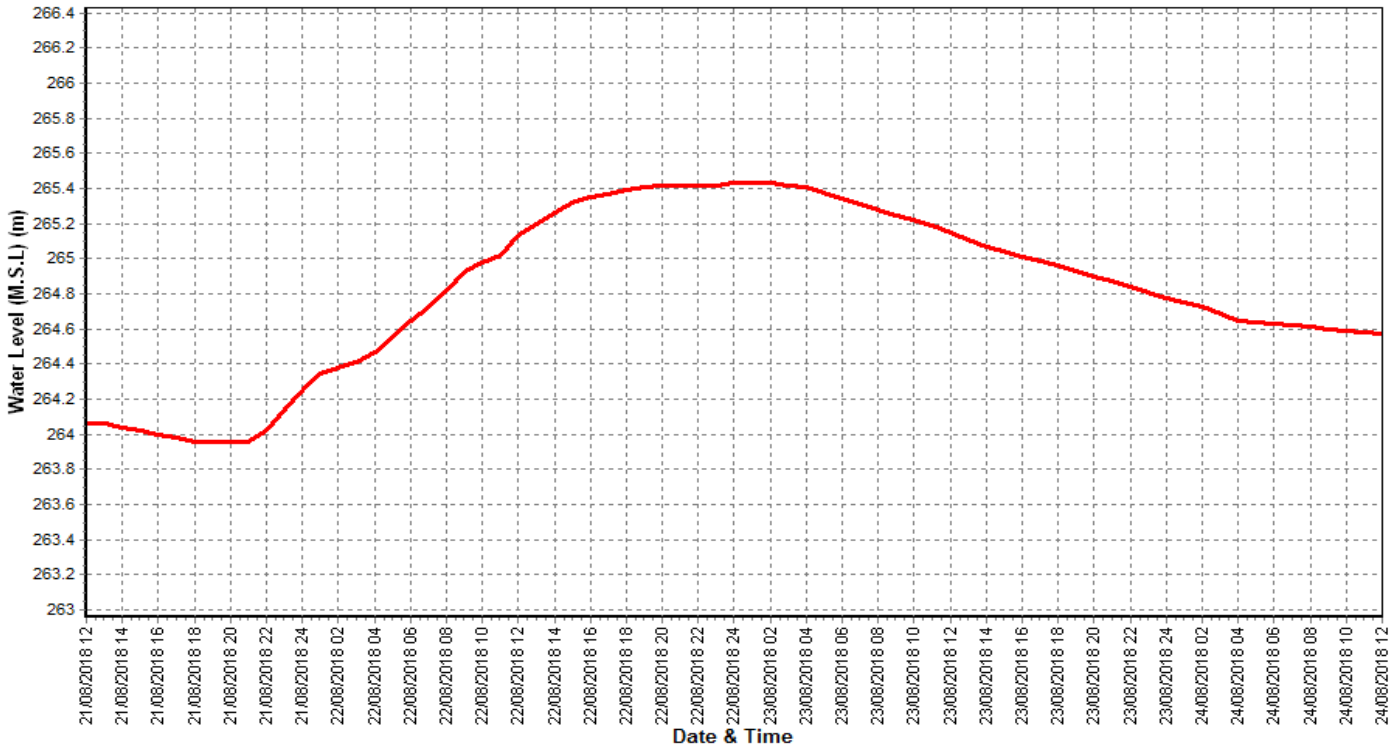
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

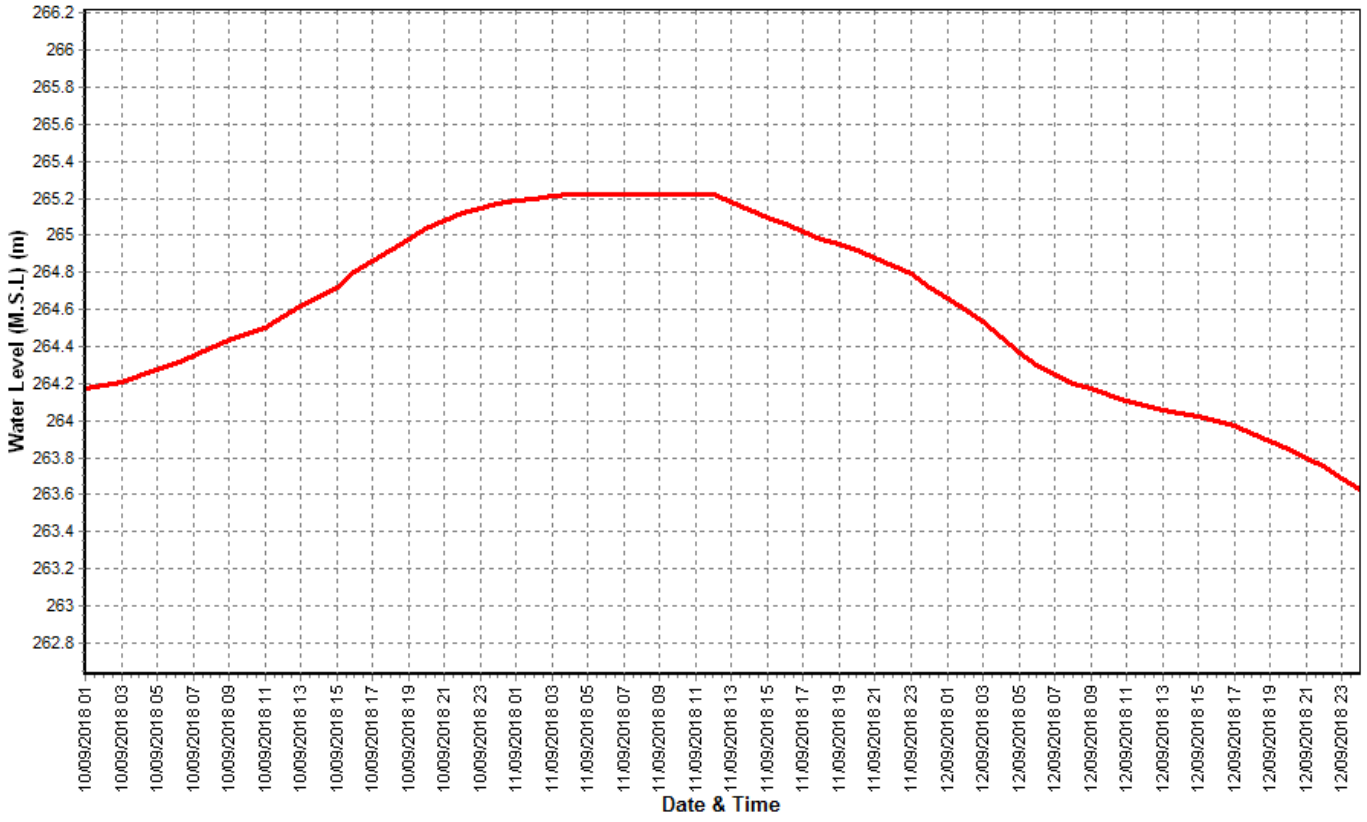
Local River : Narmada Sub-Division :MNSD II, CWC Bhopal

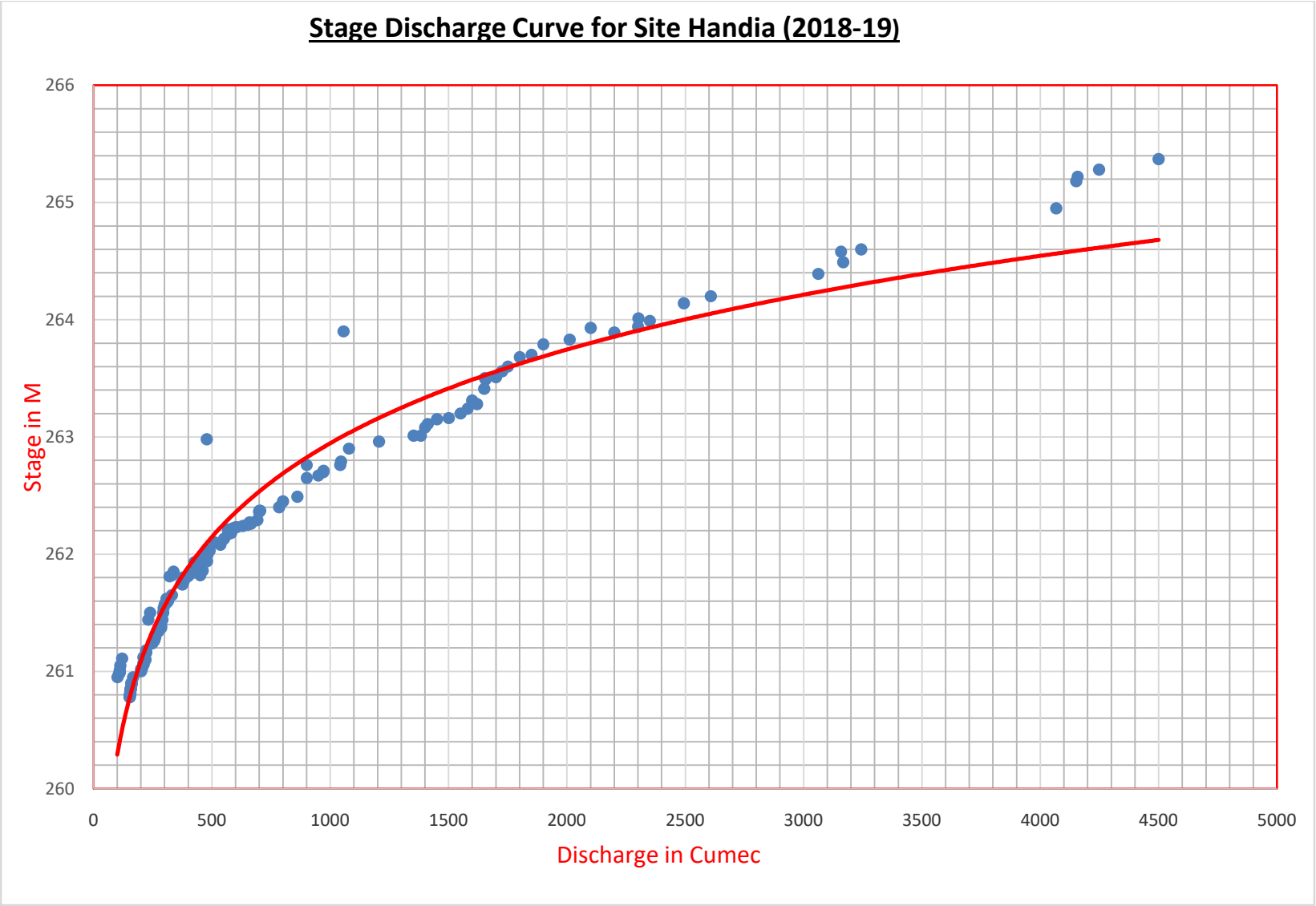


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Handia (010215022) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division :MNSD II, CWC Bhopal




Stage Discharge Curve for Site Handia (2018-19)
266
265
264
263
262
261
260
Stage in M
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Discharge in Cumec

4.6 Ganjal at Chhidgaon

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Chhidgaon	**Code**	:	004-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Ganjal	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Ganjal
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-II, Bhopal
Drainage Area	:	1729.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°24'20''	**Longitude**	:	77°18'27''
Current Zero of Gauge (m)	:	287			

CATEGORY		Opening Date	Closing Date
Gauge	:	22/12/1976	
Discharge	:	22/12/1976	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
287.0	03/06/2014	31/05/2018
287.0	31/05/2018	-
287.0	02/12/1976	03/06/2014
287.0	05/01/2017	31/05/2018
287.0	22/12/1976	31/12/1976

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	3.4	287.68	07/03/1977	0.2	287.36	22/05/1977
1977-1978	2553.8	293.3	14/09/1977	0	287.84	09/04/1978
1978-1979	3813.4	296.5	29/08/1978	0	287.8	01/06/1978
1979-1980	1235	291.565	10/08/1979	0	287.43	01/06/1979
1980-1981	1375	295.1	03/08/1980	0.2	287.515	01/06/1980
1981-1982	490.8	290.265	10/08/1981	0.4	287.41	01/06/1981
1982-1983	876	291.26	23/08/1982	0.4	287.445	16/05/1983
1983-1984	2650	295.55	03/09/1983	0.3	287.42	06/06/1983
1984-1985	4470	299	10/08/1984	0.3	287.49	18/05/1985
1985-1986	1690	291.9	09/08/1985	0.3	287.485	01/06/1985
1986-1987	2675	295.99	15/08/1986	0.2	287.465	01/06/1986
1987-1988	1275	292.42	28/08/1987	0.36	287.17	25/05/1988
1988-1989	1300	292.54	04/08/1988	0.3	287.16	07/06/1988
1989-1990	863.5	291	29/06/1989	0.44	287.25	28/05/1990
1990-1991	3450	296.48	23/08/1990	0.1	287.35	01/06/1990
1991-1992	2060	294.2	30/07/1991	0.09	287.335	08/05/1992
1992-1993	1925	294.2	17/08/1992	0.02	287.335	01/06/1992
1993-1994	3700	297.2	16/07/1993	0.1	287.38	01/06/1993
1994-1995	5350	299.15	06/09/1994	0.38	287.34	01/06/1994
1995-1996	1320	292.505	02/09/1995	0.11	287.525	14/11/1995
1996-1997	2530	295.3	27/07/1996	0.2	287.45	05/06/1996
1997-1998	4500	298.9	26/07/1997	0.24	287.415	21/05/1998
1998-1999	6660	300.3	15/09/1998	0.17	287.415	15/06/1998
1999-2000	2490	295.62	10/08/1999	0.53	287.36	01/06/1999
2000-2001	960	291.9	13/07/2000	0.4	287.27	20/05/2001
2001-2002	1700	294	15/08/2001	0.27	287.26	19/05/2002
2002-2003	1200	292.6	23/08/2002	0.24	287.4	17/07/2002
2003-2004	2380	296.3	27/07/2003	0.31	287.295	07/06/2003
2004-2005	2170	297	22/08/2004	0.5	287.23	06/06/2004
2005-2006	926.52	292.64	01/08/2005	0.37	287.28	31/05/2006
2006-2007	5142.51	296.5	31/08/2006	0.29	287.28	04/06/2006
2007-2008	9625	301.81	08/07/2007	0.09	287.6	06/06/2007
2008-2009	810.87	291.57	11/08/2008	0.02	287.6	02/03/2009
2009-2010	1878.3	293.28	22/07/2009	0	287.5	12/05/2010

2010-2011	270.78	289.95	09/09/2010	0.35	287.37	27/05/2011
2011-2012	815.98	291.4	26/08/2011	0.27	287.31	25/05/2012
2012-2013	832.46	292	06/09/2012	0.42	287.36	06/06/2012
2013-2014	7527.57	300.75	23/08/2013	0.57	287.4	05/06/2013
2014-2015	693.32	291.3	23/07/2014	0	287.55	26/05/2015
2015-2016	1003.84	292.1	05/08/2015	0	287.4	02/03/2016
2016-2017	6050.3	298.5	12/07/2016	1.29	287.46	01/07/2016
2017-2018	338.57	289.9	21/07/2017	0	287.52	01/06/2017
2018-2019	395.85	290.8	21/08/2018	0	287.59	16/06/2018

Stage Discharge Sheet for Ganjal at Chhidgaon for the period 2018-19

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	287.470	0.0	287.890	0.0	288.140	12.33	*	288.500	56.35		288.120	17.32		287.950	0.000	*
2	287.470	0.0	287.880	0.0	288.150	12.74	*	288.300	27.00	*	288.110	16.00	*	287.950	0.000	*
3	287.470	0.0	287.870	0.0	288.120	12.47	*	288.250	26.25		288.100	16.93		287.950	0.000	*
4	287.500	0.0	287.860	0.0	288.060	11.56	*	288.220	23.59		288.090	16.10		287.940	0.000	*
5	287.500	.0.0	287.850	.0.0	288.040	11.00	*	288.220	23.89		288.080	15.07		287.940	0.000	*
6	287.490	0.0	287.850	0.0	288.100	11.88	*	288.200	21.69		288.070	13.85		287.940	0.000	*
7	287.490	0.0	287.940	0.0	288.080	10.99	*	288.270	40.68		288.060	13.00	*	287.930	0.000	*
8	287.480	0.0	287.930	0.0	288.080	10.87	*	288.310	41.70		288.050	13.54		287.930	0.000	*
9	287.490	0.0	287.950	0.0	288.090	11.55	*	288.270	35.00	*	288.050	13.39		287.930	0.000	*
10	287.660	0.0	287.940	0.0	288.090	11.77	*	288.240	34.79		288.040	11.79		287.920	0.000	*
11	287.780	0.0	287.930	0.0	288.140	12.61	*	288.200	20.63		288.040	11.68		287.910	0.000	*
12	287.710	0.0	287.750	0.0	288.220	16.00	*	288.200	20.52		288.030	11.28		287.900	0.000	*
13	287.650	0.0	287.580	0.0	288.250	17.63	*	288.210	21.00	*	288.020	10.86		287.900	0.000	*
14	287.600	0.0	287.350	0.0	288.210	15.34	*	288.190	17.57		288.020	10.50	*	287.900	0.000	*
15	287.600	0.0	287.310	0.0	288.200	15.00	*	288.190	17.18		288.010	10.34		287.910	0.000	*
16	287.590	0.0	287.350	0.0	288.230	16.64	*	288.170	17.00	*	288.010	11.11		287.910	0.000	*
17	287.580	0.0	287.280	0.0	288.850	131.3	*	288.160	16.25		288.010	9.900		287.900	0.000	*
18	287.580	0.0	287.800	0.0	288.600	66.46	*	288.150	16.01		288.010	9.760		287.900	0.000	*
19	287.570	0.0	287.410	0.0	288.660	67.00	*	288.150	15.33		288.000	9.000	*	287.880	0.000	*
20	287.550	0.0	287.250	0.0	288.500	56.53	*	288.140	14.79		288.000	9.470		287.880	0.000	*
21	287.550	0.0	288.150	0.0	290.800	395.9	*	288.130	13.00	*	288.000	9.000	*	287.880	0.000	*
22	287.580	0.0	288.130	0.0	289.250	300.0	*	288.500	206.2		287.990	9.460		287.880	0.000	*
23	287.580	0.0	288.100	0.0	288.950	139.1	*	288.500	180.0	*	287.980	9.430		287.880	0.000	*
24	287.580	0.0	288.170	0.0	288.850	121.4	*	288.250	40.76		287.980	8.770		287.880	0.000	*
25	287.570	0.0	288.350	0.0	288.580	65.16	*	288.180	33.97		287.970	8.510		287.870	0.000	*
26	287.580	0.0	288.300	28.24	288.480	55.00	*	288.180	22.48		287.970	8.040		287.870	0.000	*
27	287.580	0.0	288.250	16.69	288.400	54.37	*	288.160	20.36		287.970	7.960		287.860	0.000	*
28	287.820	0.0	288.260	15.55	288.350	48.05	*	288.140	20.10		287.970	7.800	*	287.860	0.000	*
29	287.940	0.0	288.260	14.00	*	288.300	43.86	*	288.130	18.51		287.960	7.680		287.870	0.000	*
30	287.900	0.0	288.210	13.36		288.250	36.36	*	288.120	17.51		287.950	7.430		287.860	0.000	*
31			288.170	13.00		288.250	27.43	*				287.950	6.900				
Ten-Daily Mean																
I Ten-Daily	287.502		287.896			288.095	11.72		288.278	33.09		288.077	14.70		287.938	0.000	
II Ten-Daily	287.621		287.501			288.386	41.45		288.176	17.63		288.015	10.39		287.899	0.000	
III Ten-Daily	287.668		288.214	16.81		288.769	117.0		288.229	57.29		287.972	8.271		287.871	0.000	
Monthly																
Min.	287.470		287.250	13.00		288.040	10.87		288.120	13.00		287.950	6.900		287.860	0.000	
Max.	287.940		288.350	28.24		290.800	395.9		288.500	206.2		288.120	17.32		287.950	0.000	
Mean	287.597		287.881	16.81		288.428	58.66		288.228	36		288.020	11.03		287.903	0	

Annual Runoff in MCM = 289 Annual Runoff in mm = 167

Peak Observed Discharge = 206.2 cumecs on 22/09/2018 Corres. Water Level :288.5 m

Lowest Observed Discharge = 6.900 cumecs on 31/10/2018 Corres. Water Level :287.95 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

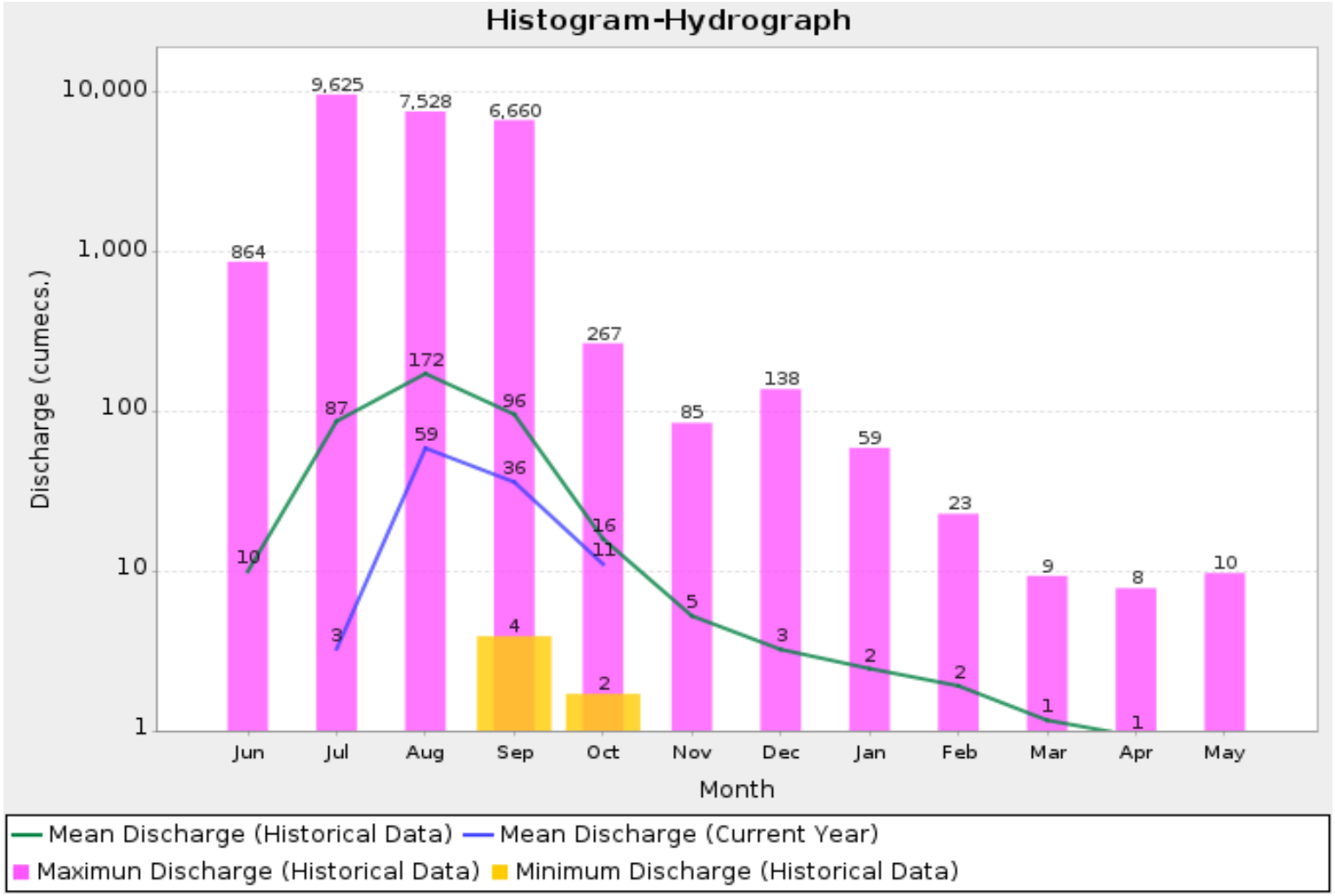
Stage Discharge Sheet for Ganjal at Chhidgaon for the period 2018-19

Day	Dec			Jan			Feb		Mar		Apr		May	
	W.L	Q		WL	Q		WL	Q	WL	Q	WL	Q	WL	Q
1	287.860	0.000	*	287.850	0.000	*	287.820	0.0	287.740	0.0	287.740	0.0	287.650	0.0
2	287.850	0.000	*	287.850	0.000	*	287.820	0.0	287.740	0.0	287.740	0.0	287.650	0.0
3	287.850	0.000	*	287.860	0.000	*	287.820	0.0	287.770	0.0	287.730	0.0	287.640	0.0
4	287.840	0.000	*	287.860	0.000	*	287.820	0.0	287.800	0.0	287.730	0.0	287.650	0.0
5	287.840	0.000	*	287.860	0.000	*	287.820	.0.0	287.800	.0.0	287.730	.0.0	287.650	.0.0
6	287.840	0.000	*	287.860	0.000	*	287.810	0.0	287.790	0.0	287.720	0.0	287.650	0.0
7	287.840	0.000	*	287.860	0.000	*	287.810	0.0	287.790	0.0	287.710	0.0	287.650	0.0
8	287.830	0.000	*	287.870	0.000	*	287.800	0.0	287.780	0.0	287.710	0.0	287.650	0.0
9	287.830	0.000	*	287.870	0.000	*	287.800	0.0	287.770	0.0	287.700	0.0	287.650	0.0
10	287.840	0.000	*	287.870	0.000	*	287.800	0.0	287.760	0.0	287.700	0.0	287.650	0.0
11	287.840	0.000	*	287.870	0.000	*	287.800	0.0	287.750	0.0	287.690	0.0	287.650	0.0
12	287.840	0.000	*	287.860	0.000	*	287.790	0.0	287.750	0.0	287.690	0.0	287.650	0.0
13	287.840	0.000	*	287.860	0.000	*	287.790	0.0	287.750	0.0	287.690	0.0	287.650	0.0
14	287.840	0.000	*	287.870	0.000	*	287.780	0.0	287.750	0.0	287.690	0.0	287.650	0.0
15	287.850	0.000	*	287.870	0.000	*	287.770	0.0	287.770	0.0	287.680	0.0	287.650	0.0
16	287.850	0.000	*	287.860	0.000	*	287.760	0.0	287.780	0.0	287.680	0.0	287.650	0.0
17	287.850	0.000	*	287.860	0.000	*	287.750	0.0	287.790	0.0	287.700	0.0	287.650	0.0
18	287.840	0.000	*	287.860	0.000	*	287.750	0.0	287.800	0.0	287.700	0.0	287.650	0.0
19	287.840	0.000	*	287.860	0.000	*	287.740	0.0	287.790	0.0	287.700	0.0	287.640	0.0
20	287.840	0.000	*	287.860	0.000	*	287.740	0.0	287.780	0.0	287.700	0.0	287.640	0.0
21	287.840	0.000	*	287.860	0.000	*	287.750	0.0	287.770	0.0	287.690	0.0	287.640	0.0
22	287.840	0.000	*	287.860	0.000	*	287.730	0.0	287.760	0.0	287.690	0.0	287.640	0.0
23	287.840	0.000	*	287.850	0.000	*	287.730	0.0	287.750	0.0	287.680	0.0	287.640	0.0
24	287.840	0.000	*	287.850	0.000	*	287.730	0.0	287.740	0.0	287.680	0.0	287.640	0.0
25	287.840	0.000	*	287.850	0.000	*	287.750	0.0	287.740	0.0	287.670	0.0	287.640	0.0
26	287.840	0.000	*	287.850	0.000	*	287.740	0.0	287.740	0.0	287.660	0.0	287.640	0.0
27	287.850	0.000	*	287.850	0.000	*	287.740	0.0	287.740	0.0	287.660	0.0	287.640	0.0
28	287.850	0.000	*	287.850	0.000	*	287.740	0.0	287.740	0.0	287.660	0.0	287.640	0.0
29	287.850	0.000	*	287.840	0.000	*		0.0	287.740	0.0	287.650	0.0	287.640	0.0
30	287.850	0.000	*	287.840	0.000	*		0.0	287.740	0.0	287.650	0.0	287.630	0.0
31	287.850	0.000	*	287.830	0.000	*			287.740				287.630	
Ten-Daily Mean														
I Ten-Daily	287.842	0.000		287.861			287.812		287.774		287.721		287.649	
II Ten-Daily	287.843	0.000		287.863			287.767		287.771		287.692		287.648	
III Ten-Daily	287.845	0.000		287.848			287.739		287.745		287.669		287.638	
Monthly														
Min.	287.830	0.000		287.830			287.730		287.740		287.650		287.630	
Max.	287.860	0.000		287.870			287.820		287.800		287.740		287.650	
Mean	287.843	0		287.857			287.775		287.763		287.694		287.645	

Peak Computed Discharge = 395.9 cumecs on 21/08/2018 Corres. Water Level :290.8 m
Lowest Computed Discharge = 0.000 cumecs on 01/11/2018 Corres. Water Level :287.95 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram – Hydrograph for Water Year : 2018-19 (Data considered : 1977-2019)



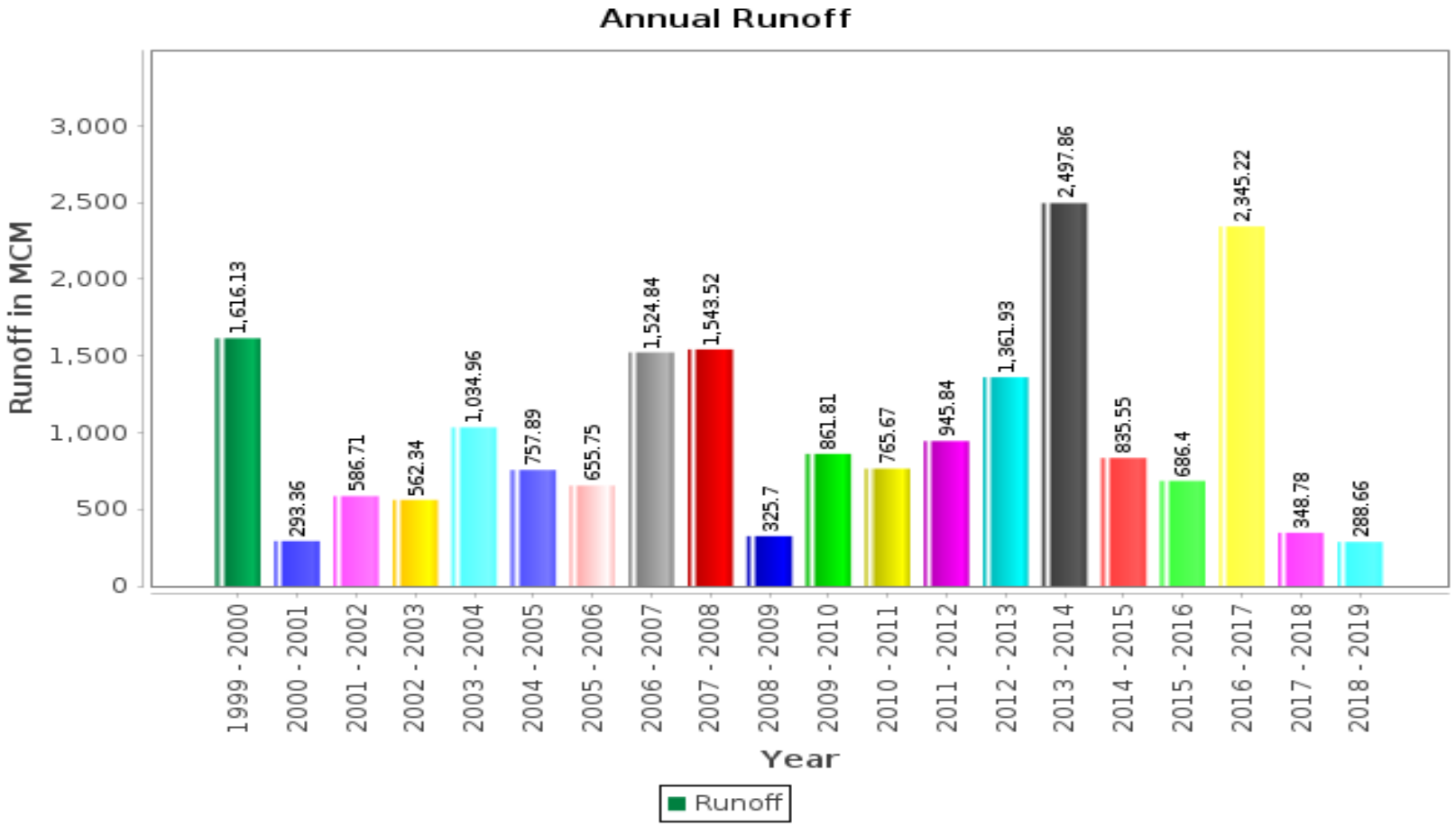
Annual Runoff Values for the period (1979 – 2019)

Station Name : Ganjal at Chhidgaon (010215020)

Division : Narmada Division, Bhopal

Local River : Ganjal

Sub-Division :MNSD II, CWC Bhopal

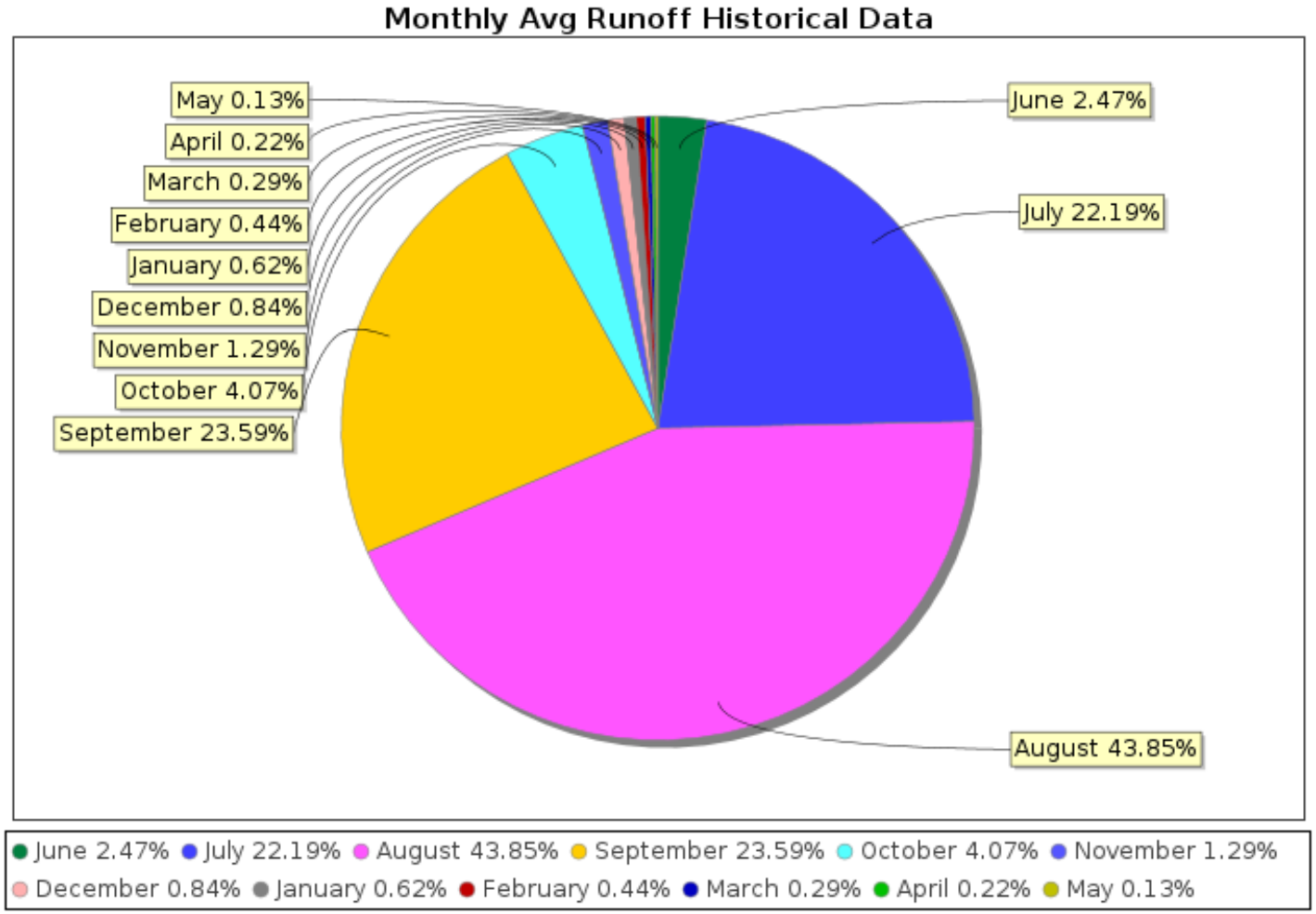


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977 – 2019)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal



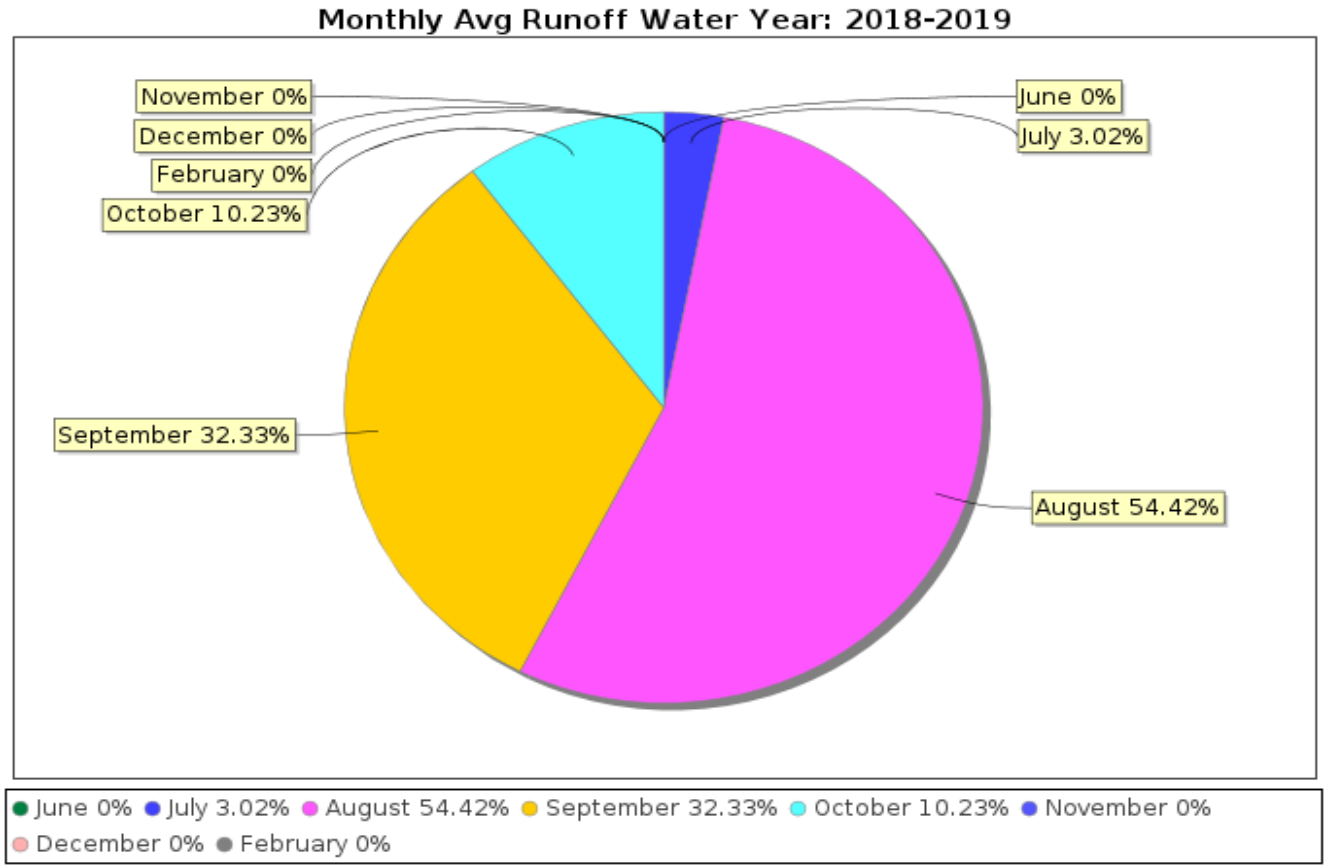
Monthly Runoff for the Year (2018-19)

Station Name : Ganjal at Chhidgaon (010215020)

Division : Narmada Division, Bhopal

Local River : Ganjal

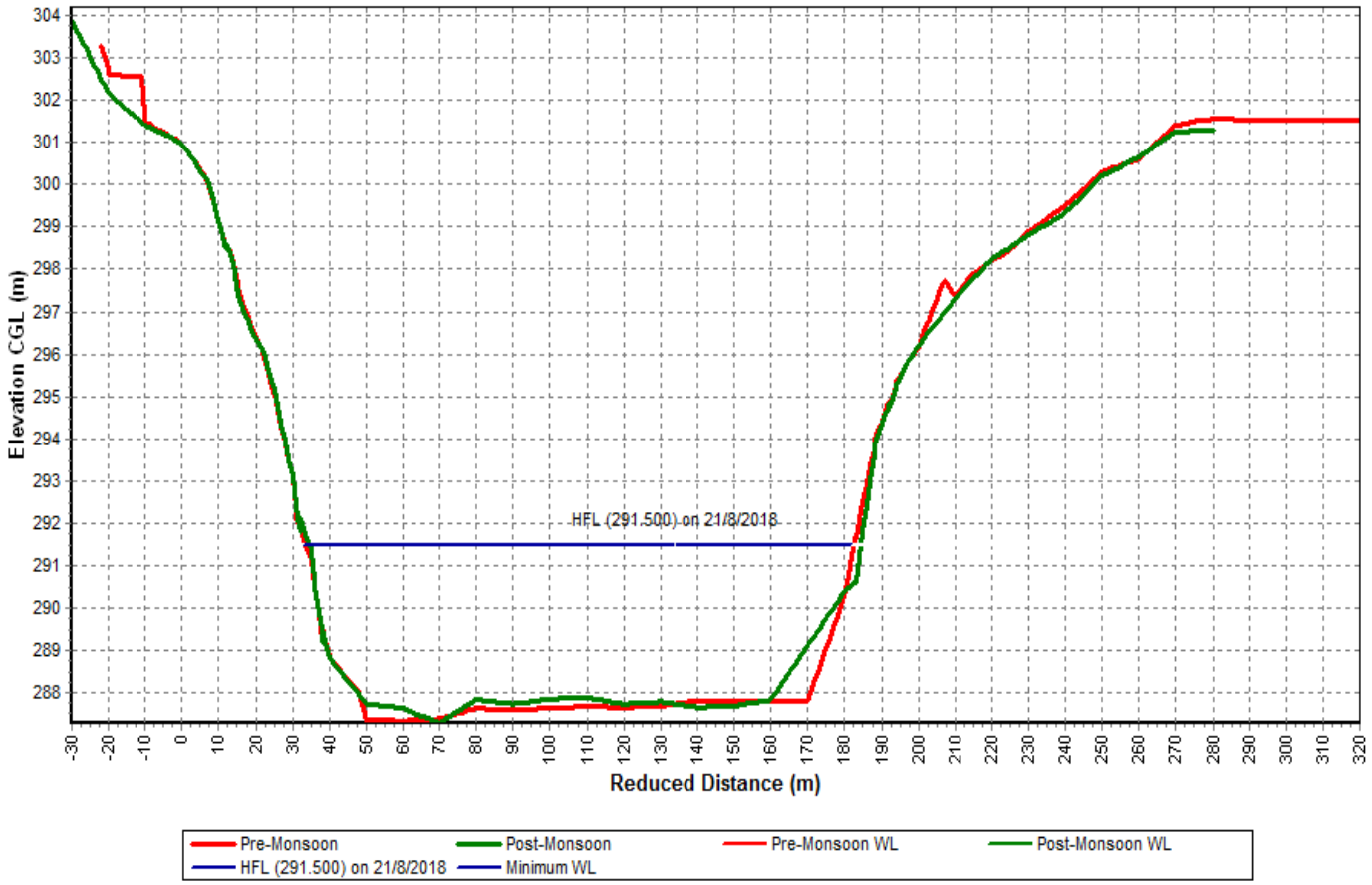
Sub-Division :MNSD II, CWC Bhopal



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

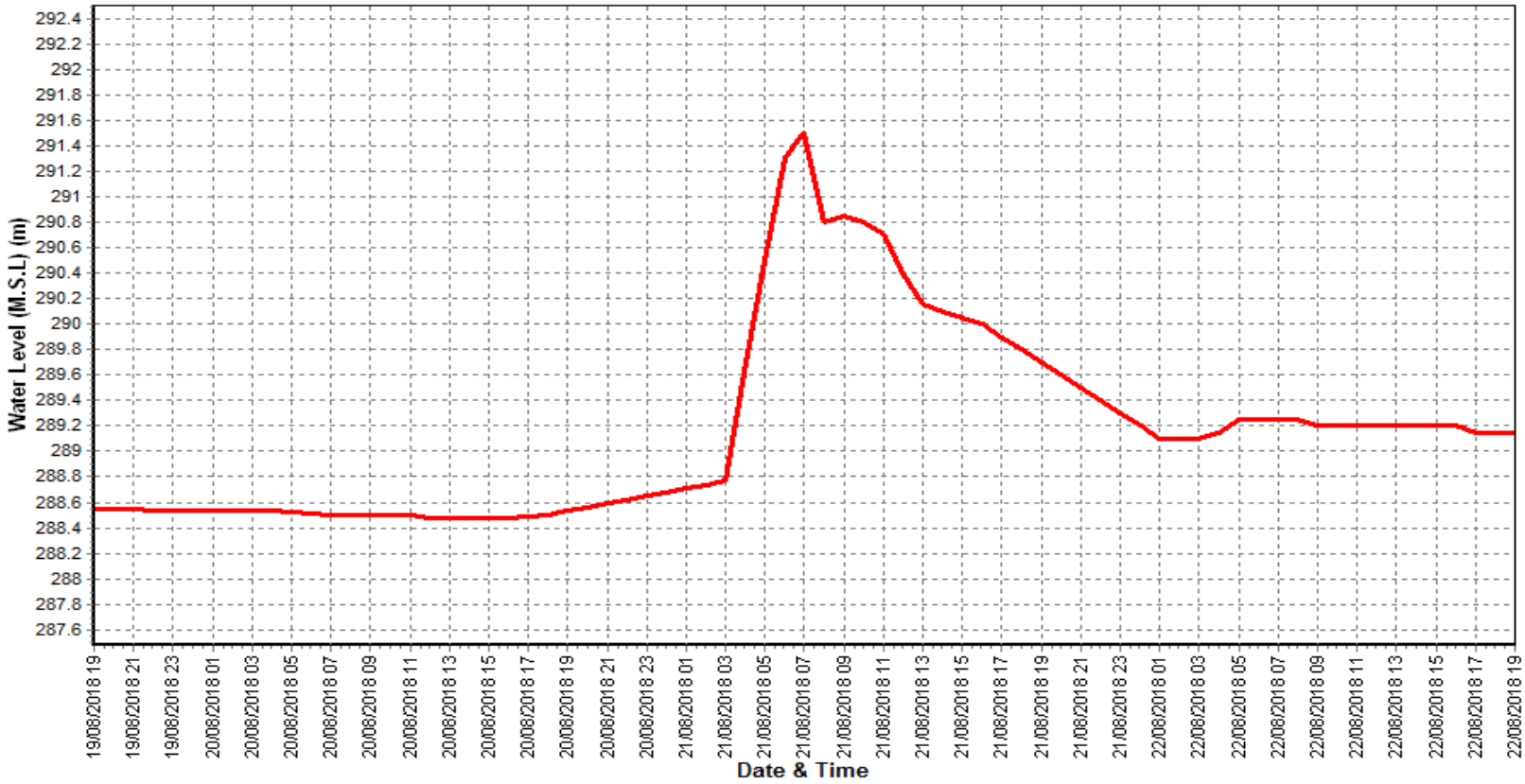
Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

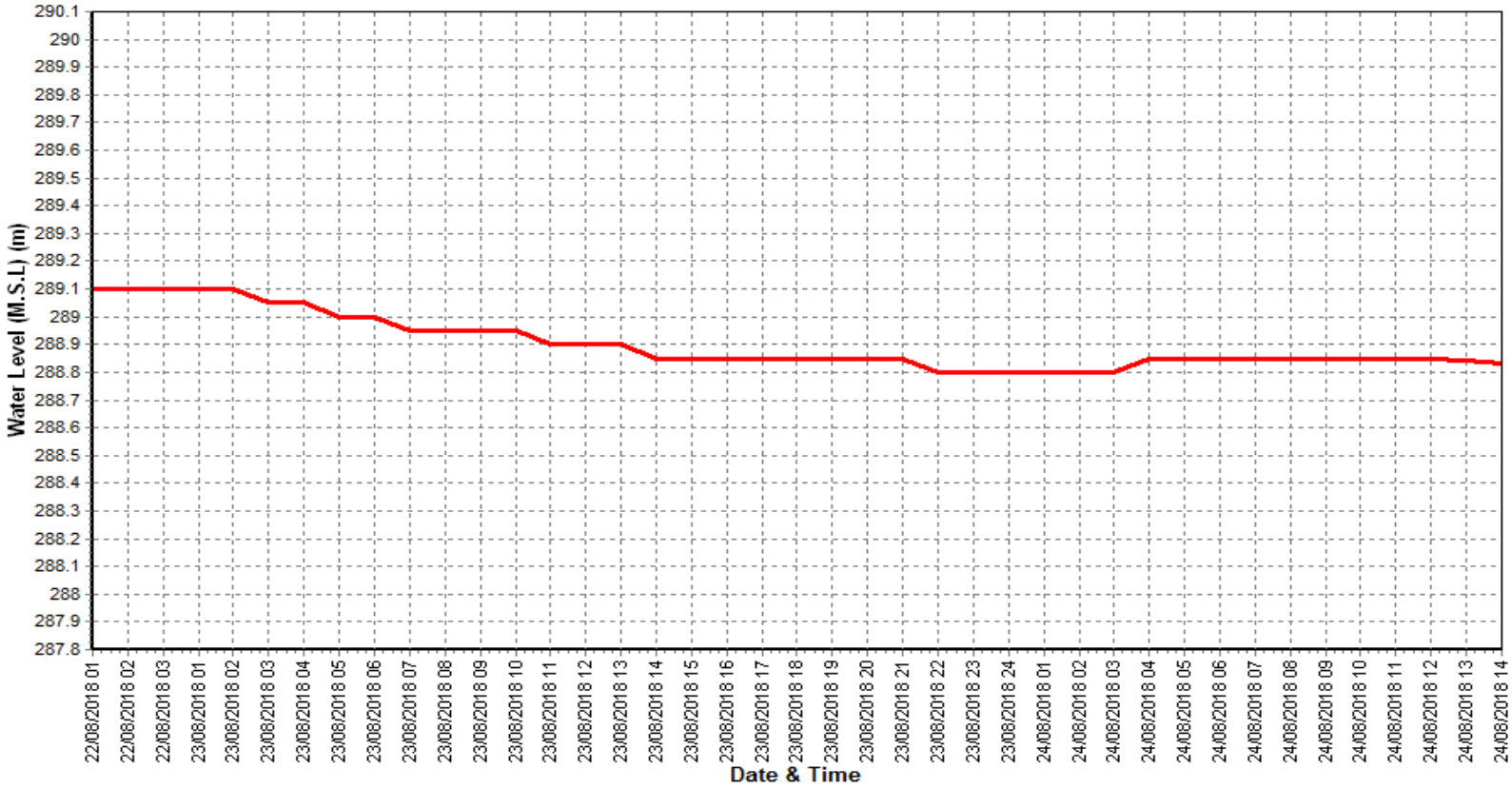
Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2015-16)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

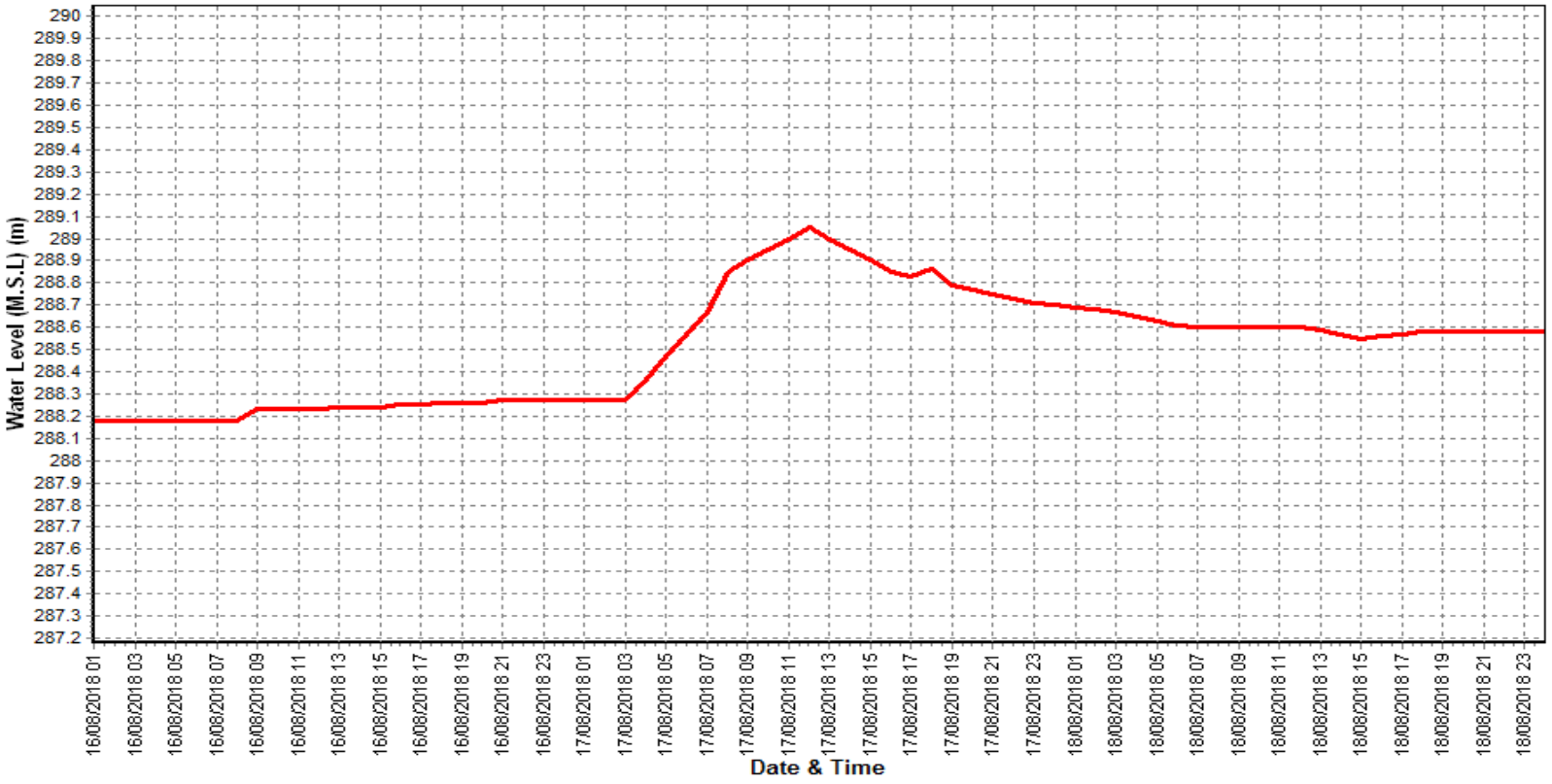
Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal

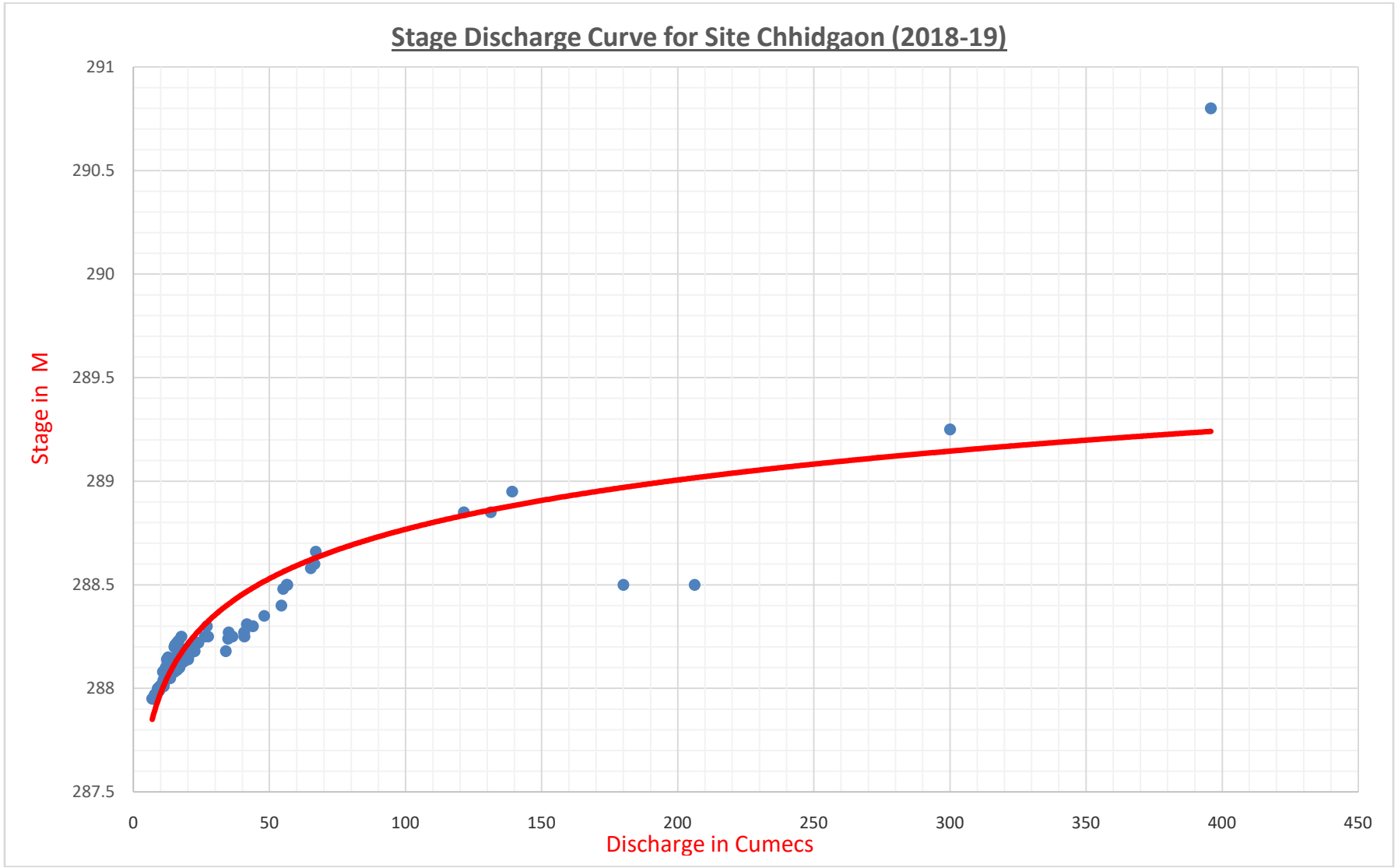


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2015-16)

Station Name : Ganjal at Chhidgaon (010215020) Division : Narmada Division, Bhopal

Local River : Ganjal Sub-Division :MNSD II, CWC Bhopal




Stage Discharge Curve for Site Chhidgaon (2018-19)
Stage in M
Discharge in Cumecs
291
290.5
290
289.5
289
288.5
288
287.5
0
50
100
150
200
250
300
350
400
450

4.7 Narmada at Hoshangabad

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Hoshangabad	**Code**	:	016-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	44548.0 Sq. Km.	**Bank**	:	
Latitude	:	22°45'21''	**Longitude**	:	77°44'3''
Current Zero of Gauge (m)	:	282			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
282.0	05/01/2017	-
282.0	01/01/2013	24/04/2014
282.0	21/05/1972	25/04/2014
282.0	25/04/2014	05/01/2017

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	0	0	13/01/1972	0	0	13/01/1972
1972-1973	2941.7	288.543	16/09/1972	23.5	284.14	27/05/1973
1973-1974	31600	300.625	30/08/1973	25	284.13	03/06/1973
1974-1975	28435.3	300.805	20/08/1974	22.4	283.805	30/05/1975
1975-1976	13865.2	295.21	25/08/1975	19.4	283.805	11/06/1975
1976-1977	10350	292.995	05/08/1976	15	283.775	26/05/1977
1977-1978	15436.6	296.045	09/08/1977	15.2	283.77	09/06/1977
1978-1979	18400	295.895	26/08/1978	27	283.885	02/06/1978
1979-1980	11200.7	294.345	10/08/1979	14.3	283.775	30/05/1980
1980-1981	21893.4	296.4	30/08/1980	14.9	283.77	03/06/1980
1981-1982	5853.6	290.475	17/08/1981	20	283.9	15/06/1981
1982-1983	16885.7	294.55	23/08/1982	21.4	284.827	26/06/1982
1983-1984	22020	296.2	10/09/1983	26.9	284.145	16/06/1983
1984-1985	28600	298.61	19/08/1984	27.9	283.93	29/05/1985
1985-1986	12470	293.69	10/08/1985	19	283.96	09/06/1985
1986-1987	20680	296.25	24/07/1986	20.1	283.95	30/05/1987
1987-1988	15945	294.66	18/09/1987	15	283.9	29/05/1988
1988-1989	16800	295.09	05/08/1988	15.07	283.895	03/06/1988
1989-1990	10800	292.53	08/08/1989	18.87	283.925	03/06/1989
1990-1991	12810	293.5	23/08/1990	12.8	284.715	03/02/1991
1991-1992	20000	296.4	25/08/1991	58	284.26	11/05/1992
1992-1993	9750	292.01	13/09/1992	56.58	284.22	12/07/1992
1993-1994	12100	293.37	06/08/1993	49	284.48	10/06/1993
1994-1995	20200	296.16	22/07/1994	100.4	284.415	21/01/1995
1995-1996	10100	292.23	12/08/1995	102.6	284.48	02/06/1995
1996-1997	3450	288.5	27/07/1996	87.39	284.19	22/06/1996
1997-1998	11860	292.05	26/07/1997	67.84	284.19	11/06/1997
1998-1999	18000	295.14	15/09/1998	49	284.21	30/05/1999
1999-2000	27800	299.53	19/09/1999	42	284.2	06/06/1999
2000-2001	5600	290.32	29/07/2000	70	284.24	11/04/2001
2001-2002	6280	290.19	16/07/2001	67.81	284.25	04/06/2001
2002-2003	14560	294.2	19/08/2002	85.42	284.41	30/05/2003
2003-2004	12539	292.7	28/07/2003	72.78	284.36	19/05/2004
2004-2005	12500	293.31	23/08/2004	64.7	284.29	07/06/2004
2005-2006	14279.56	294	06/07/2005	18.5	284.19	12/06/2005
2006-2007	14924	294.69	01/09/2006	62.42	284.19	25/06/2006

2007-2008	9373.05	291.8	09/07/2007	9.55	284	08/07/2007
2008-2009	6239.87	289.99	02/08/2008	76.04	284.31	23/01/2009
2009-2010	20983.97	296.89	10/09/2009	48.93	284.21	04/07/2009
2010-2011	4784.35	289.5	05/09/2010	65.88	284.33	06/12/2010
2011-2012	9075.81	291.5	24/07/2011	0	284.26	12/06/2011
2012-2013	16972.88	295.55	07/08/2012	38.96	284.13	07/06/2012
2013-2014	23529.48	299.18	23/08/2013	91.14	284.25	16/05/2014
2014-2015	4751.59	289.1	09/08/2014	83.77	284.3	29/06/2014
2015-2016	2796.64	287.99	14/08/2015	86.01	284.32	20/11/2015
2016-2017	8000	291.7	09/07/2016	10.9	291	10/07/2016
2017-2018	1450	286.65	22/07/2017	26	284.37	18/02/2018
2018-2019	1750	288.84	01/09/2018	37.7	284.28	15/05/2019

Stage Discharge Sheet for Narmada at Hoshangabad for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	110	284.68	104	284.65	750	285.7	1750	288.84
2	110.7	284.68	114.7	284.7	360	285.46	1700	288.35
3	99	284.63	170	284.77	330	285.31	1370	287.35
4	94.5	284.6	184.9	284.8	340	285.25	1160	286.88
5	99.1	284.63	185	284.81	325	285.23	1075	286.62
6	99.2	284.63	250	284.9	320	285.22	950	286.38
7	98.7	284.58	350	285.18	310	285.19	1100	286.68
8	84.3	284.54	340	285.04	300	285.15	1230	286.92
9	84.6	284.55	320	285.03	305	285.17	1360	287.4
10	94	284.6	260	284.94	1255	285.1	1700	288.7
11	94.5	284.6	320	285.2	1050	286.56	1600	288
12	99.5	284.63	350	285.25	440	285.08	1120	286.68
13	97.2	284.62	335	285.13	650	285.74	890	286.2
14	102.3	284.64	300	285	600	285.62	850	286.05
15	98.9	284.58	350	285.41	550	285.52	700	285.76
16	81	284.53	325	285.32	450	285.49	460	285.49
17	81	284.53	355	285.44	650	285.9	370	285.38
18	95.6	284.61	370	285.6	870	286.26	350	285.32
19	107.1	284.66	400	285.05	950	286.42	348	285.28
20	95.5	284.61	420	286.27	840	286.2	340	285.24
21	93.9	284.6	410	286.07	850	286.21	320	285.2
22	97.4	284.62	390	285.65	1650	288.68	315	285.17
23	102	284.64	365	285.38	1550	287.8	310	285.16
24	104	284.65	349	285.25	1350	287.35	375	285.37
25	102	284.64	450	286.45	1230	286.98	345	285.32
26	110.6	284.67	1300	287.25	1070	286.61	340	285.31
27	102.4	284.64	1250	287.08	840	286.16	338	285.25
28	93.9	284.6	1200	286.74	700	285.8	325	285.21
29	102.8	284.64	900	286.33	680	285.71	320	285.17
30	103.1	284.64	850	286.11	1650	287.79	310	285.14
31			800	285.91	1600	287.71		
Ten-Daily Mean								
I Ten-Daily	97.41	284.61	227.86	284.88	459.5	285.28	1339.5	287.41
II Ten-Daily	95.26	284.6	352.5	285.37	705	285.88	702.8	285.94
III Ten-Daily	101.21	284.63	751.27	286.2	1197.27	286.98	329.8	285.23
Monthly								
Min.	81	284.53	104	284.65	300	285.08	310	285.14
Max.	110.7	284.68	1300	287.25	1650	288.68	1750	288.84
Mean	97.96	284.62	443.88	285.48	787.26	286.05	790.7	286.19

Annual Runoff in MCM : 8635.52 **Annual Runoff in mm : 193.85**

Peak Observed Discharge = 1560 cumecs on 9/10/2018 Corres. Water Level 284.76 m

Lowest Observed Discharge = 37.7cumecs on 15/5/2019 Corres. Water Level 284.28 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Hoshangabad for the period 2018-19

Day	October		November		December	
	Q	W.L	Q	W.L	Q	W.L
1	300	285.11	173.3	284.63	142.8	284.46
2	300	285.1	172.9	284.58	155	284.54
3	290	285.09	158.3	284.53	155.6	284.5
4	295	285.05	154	284.51	147	284.47
5	290	285.03	170	284.58	147.5	284.47
6	285	284.99	185	284.65	173.8	284.58
7	280	284.95	192	284.7	158.9	284.53
8	270	284.85	180	284.68	157	284.52
9	1560	284.76	175	284.6	154.4	284.5
10	270	284.85	168	284.58	160	284.56
11	275	284.9	165	284.57	165	284.61
12	270	284.9	160	284.49	160	284.57
13	272	284.87	158	284.46	78.2	284.52
14	273	284.9	160	284.46	145	284.48
15	268	284.87	140.4	284.45	142	284.47
16	250	284.8	142.1	284.46	150	284.54
17	252	284.8	156	284.5	152	284.5
18	120	284.72	159.5	284.49	148	284.49
19	140	284.74	170	284.57	142	284.47
20	251	284.8	160.2	284.56	144	284.48
21	154	284.77	156.5	284.54	146	284.49
22	130.4	284.77	128.6	284.41	162	284.59
23	245	284.79	158.5	284.47	164	284.61
24	128.7	284.74	144.9	284.48	162	284.62
25	240	284.79	157.2	284.52	175	284.67
26	235	284.78	167.7	284.6	170	284.66
27	252	284.81	180	284.64	164	284.66
28	250	284.81	156	284.55	163	284.66
29	183.7	284.73	149.7	284.5	176	284.68
30	180.5	284.75	147.2	284.49	195	284.72
31	175	284.67			182	284.69
Ten-Daily Mean						
I Ten-Daily	414	284.98	172.85	284.6	155.2	284.51
II Ten-Daily	237.1	284.83	157.12	284.5	142.62	284.51
III Ten-Daily	197.66	284.76	154.63	284.52	169	284.64
Monthly						
Min.	120	284.67	128.6	284.41	78.2	284.46
Max.	1560	285.11	192	284.7	195	284.72
Mean	282.92	284.86	161.53	284.54	155.61	284.56

Peak Computed Discharge = 1750 cumecs on 1/9/2018 Corres. Water Level 288.84 m

Lowest Computed Discharge = 42cumecs on 26/5/2019 Corres. Water Level 284.32 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Hoshangabad for the period 2018-19

Day	January		February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	178	284.64	156.5	284.55	106.5	284.55	83.19	284.3	71.2	284.31
2	181	284.69	154	284.54	98.5	284.41	84.6	284.3	67.4	284.29
3	183	284.7	150	284.52	96.5	284.45	88.5	284.3	66	284.28
4	185	284.71	157.9	284.5	96	284.44	86.2	284.32	66.7	284.27
5	186	284.72	103.8	284.55	95.5	284.42	96.11	284.45	71.5	284.31
6	182	284.7	105.8	284.56	91.4	284.41	117.5	284.59	79	284.33
7	174	284.68	106.1	284.55	90.7	284.4	130	284.63	75	284.32
8	162	284.66	104	284.53	98.5	284.45	131.9	284.63	72.9	284.31
9	168.2	284.6	110	284.53	99.5	284.46	117.8	284.61	71.2	284.3
10	162.1	284.57	110	284.54	95.8	284.42	109.9	284.54	71.4	284.3
11	159.9	284.58	104.6	284.53	102.6	284.5	98.51	284.47	71	284.3
12	160	284.58	102.4	284.52	132.9	284.62	90.1	284.4	68.5	284.29
13	163	284.59	102.1	284.52	116.2	284.58	86.2	284.36	68	284.29
14	166	284.61	106.2	284.55	107.1	284.53	82	284.34	67.6	284.28
15	164	284.61	162	284.59	109.8	284.54	80	284.31	37.7	284.28
16	162	284.6	165	284.6	107.7	284.53	78.7	284.3	41.8	284.32
17	163	284.6	162	284.58	97	284.48	91	284.35	56.5	284.35
18	161	284.59	108	284.57	96.8	284.43	93.3	284.37	56	284.35
19	160	284.59	107.5	284.55	93.2	284.38	95	284.38	48	284.33
20	164	284.6	103.1	284.52	91.5	284.36	91.8	284.36	48.2	284.33
21	163	284.6	105	284.41	90.6	284.35	90.5	284.35	53.9	284.34
22	162.1	284.59	101.2	284.5	90.2	284.35	90.7	284.35	46	284.35
23	184.4	284.59	104.4	284.54	88.5	284.33	91.7	284.36	43.1	284.35
24	165	284.57	102	284.5	89	284.33	101.6	284.36	51.5	284.32
25	169	284.58	101.2	284.5	89.3	284.34	78.5	284.35	40.6	284.3
26	162	284.57	106.4	284.55	89	284.34	71.1	284.33	42	284.32
27	153	284.55	110	284.58	89.8	284.34	77.1	284.3	46.3	284.33
28	156	284.56	119.5	284.6	88.7	284.34	70	284.3	45.3	284.31
29	156.4	284.55			85.5	284.34	77.1	284.33	42.6	284.3
30	159.2	284.56			85.2	284.32	78.1	284.34	43.2	284.3
31	164.4	284.58			83	284.32			46.5	284.3
Ten-Daily Mean										
I Ten-Daily	176.13	284.67	125.81	284.54	96.89	284.44	104.57	284.47	71.23	284.3
II Ten-Daily	162.29	284.59	122.29	284.55	105.48	284.49	88.66	284.36	56.33	284.31
III Ten-Daily	163.14	284.57	106.21	284.52	88.07	284.34	82.64	284.34	45.55	284.32
Monthly										
Min.	153	284.55	101.2	284.41	83	284.32	70	284.3	37.7	284.27
Max.	186	284.72	165	284.6	132.9	284.62	131.9	284.63	79	284.35
Mean	167.19	284.61	118.1	284.54	96.81	284.42	91.96	284.39	57.7	284.31

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

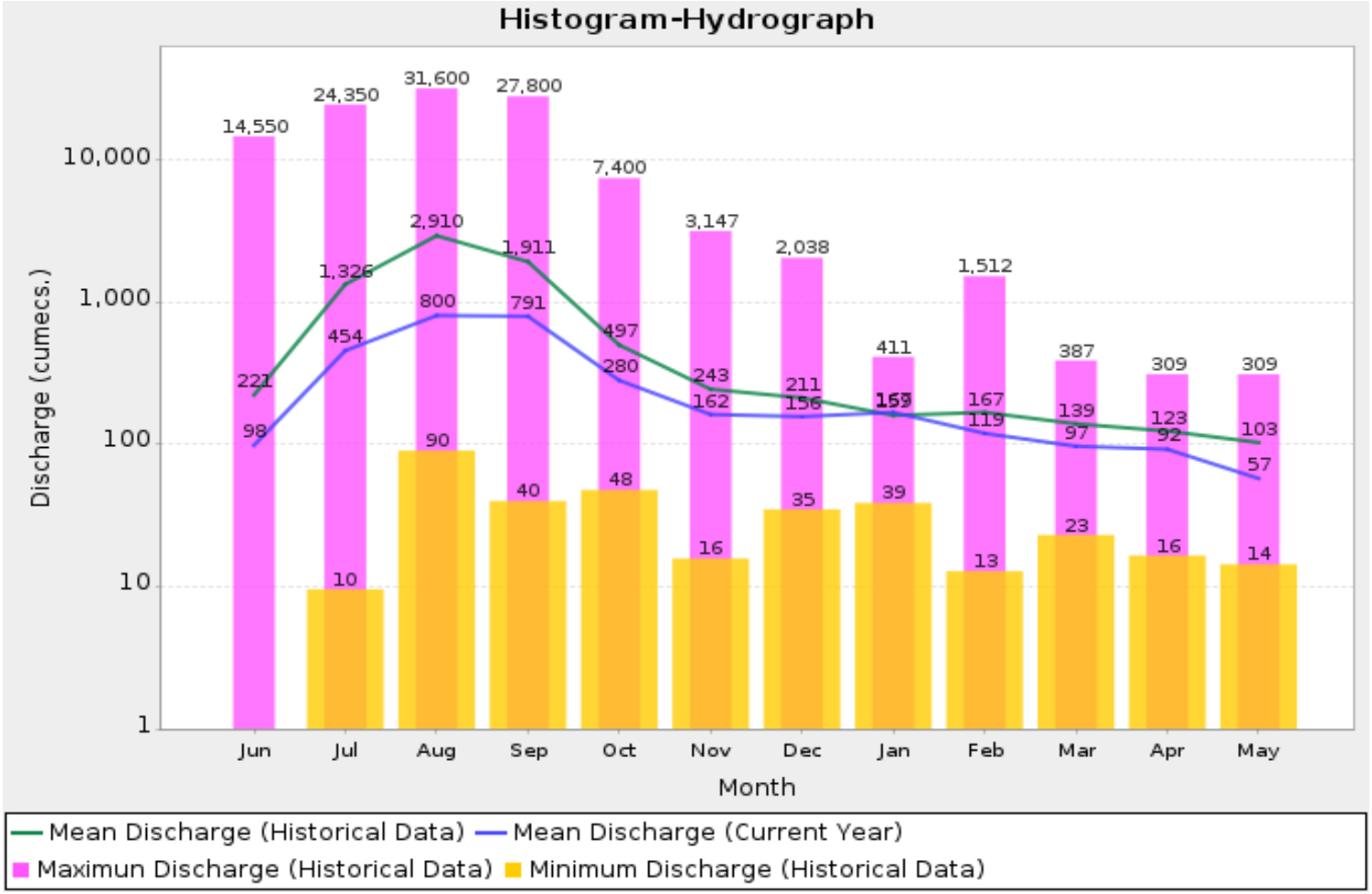
Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1973-2019)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



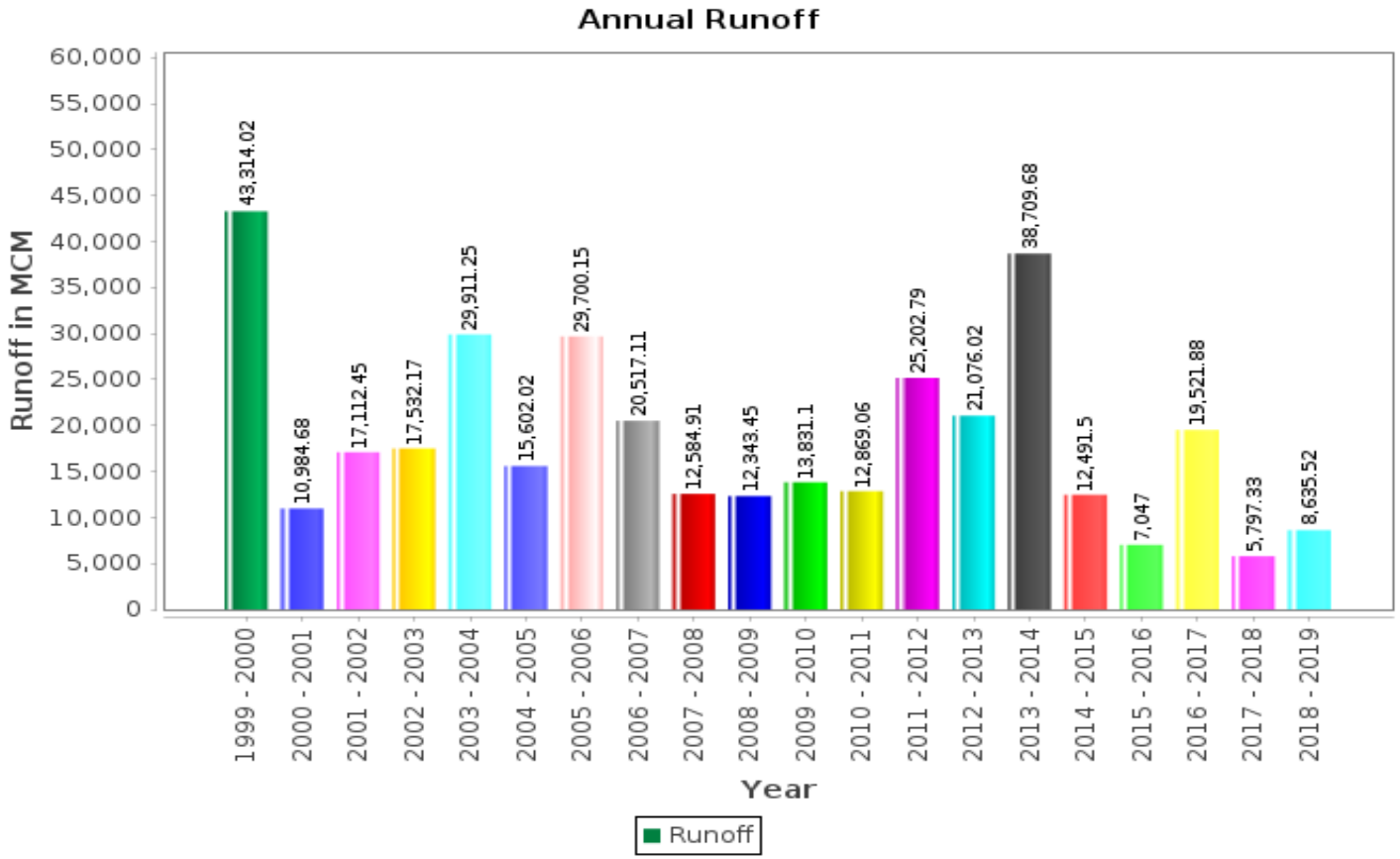
Annual Runoff Values for the period (1973 – 2019)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



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

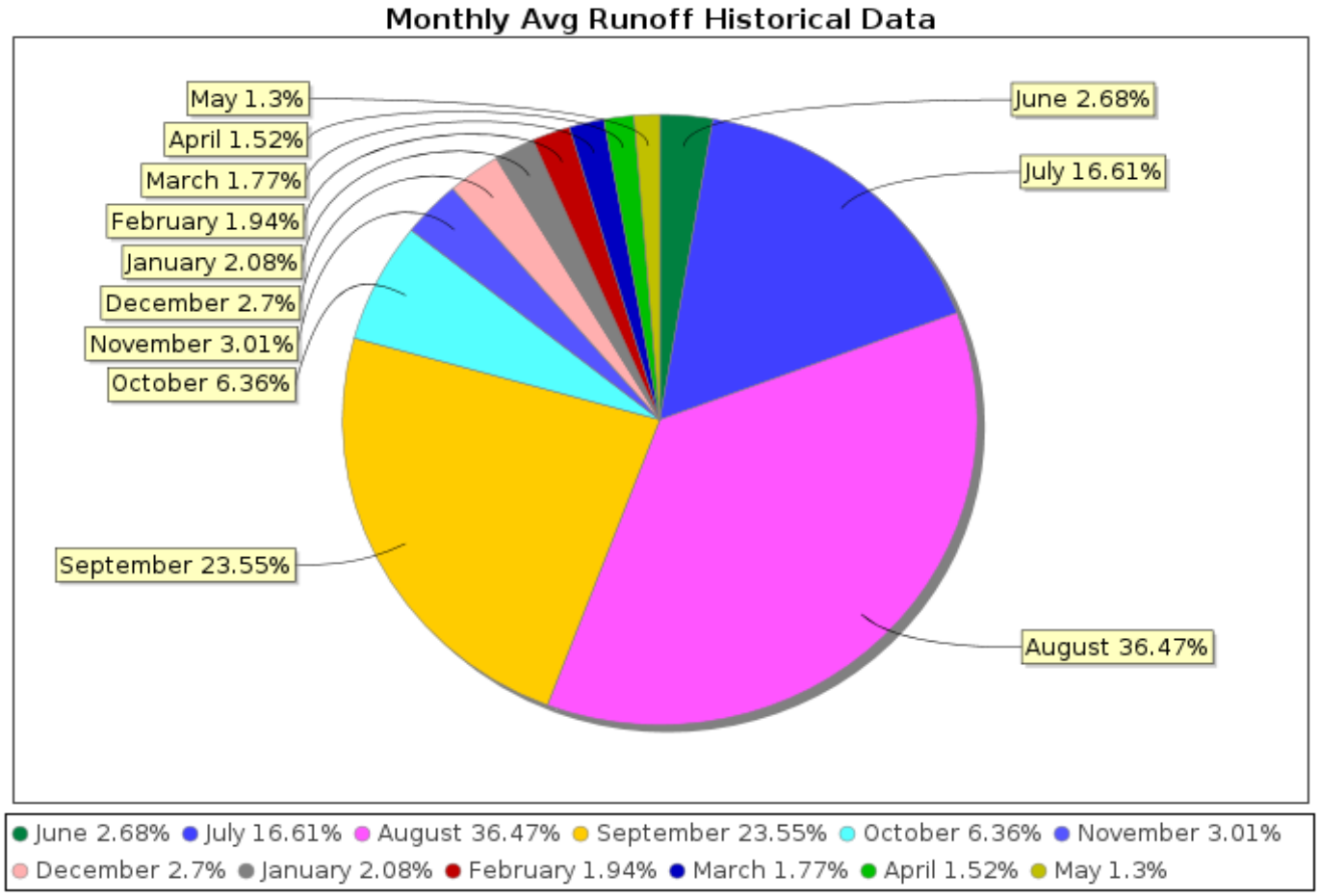
Monthly Average Runoff based on period (1973-2019)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



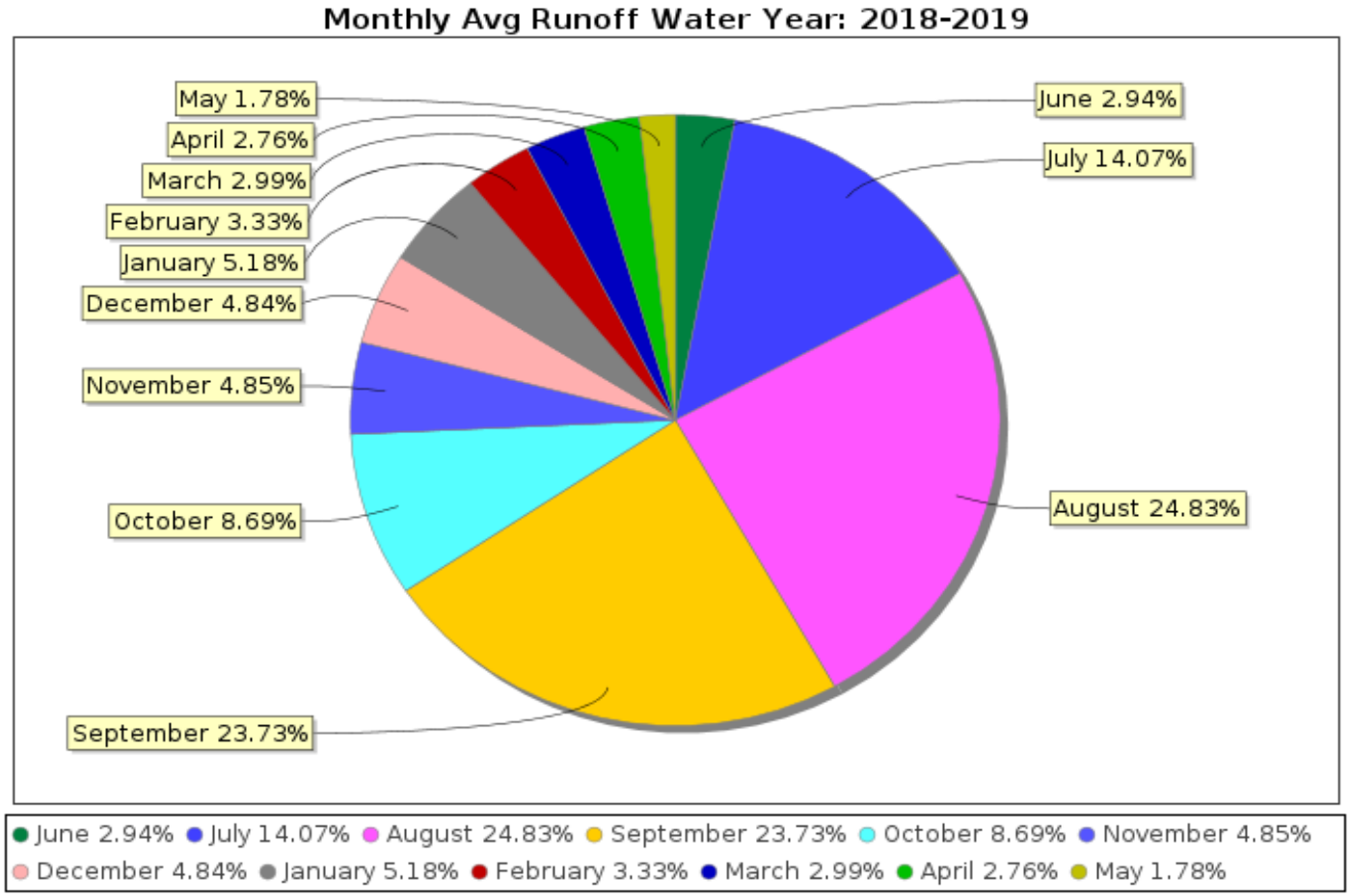
Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



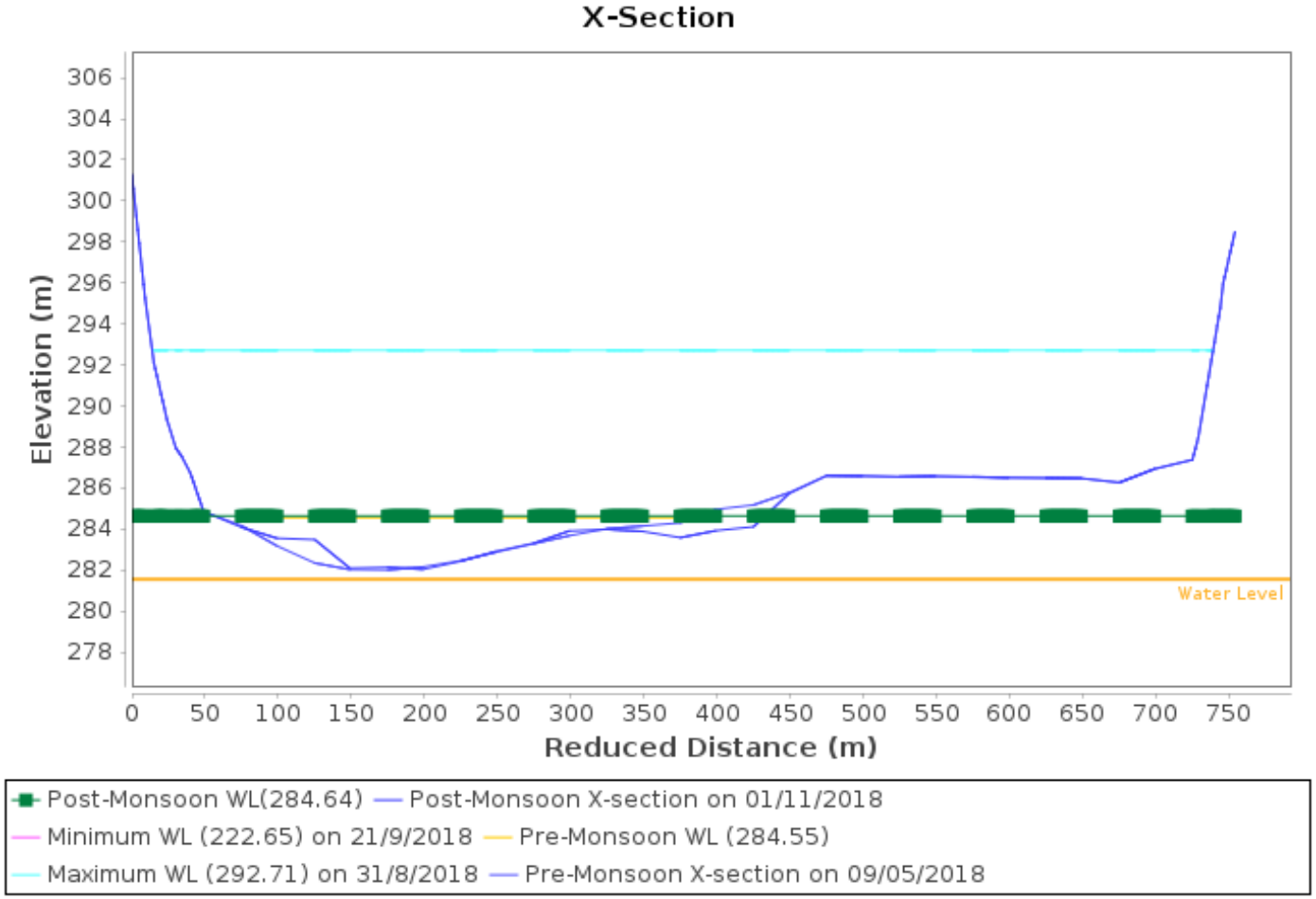
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



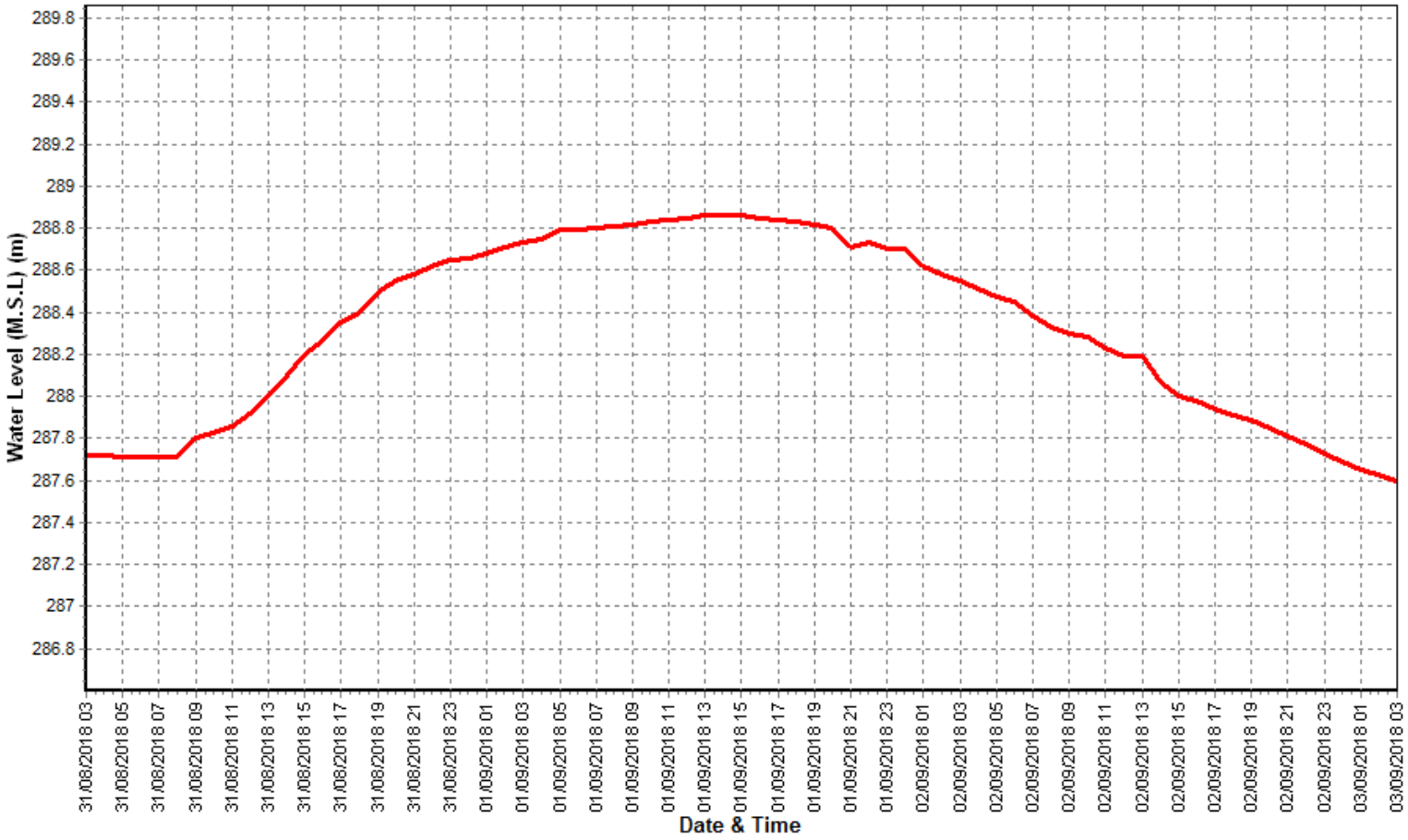
Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



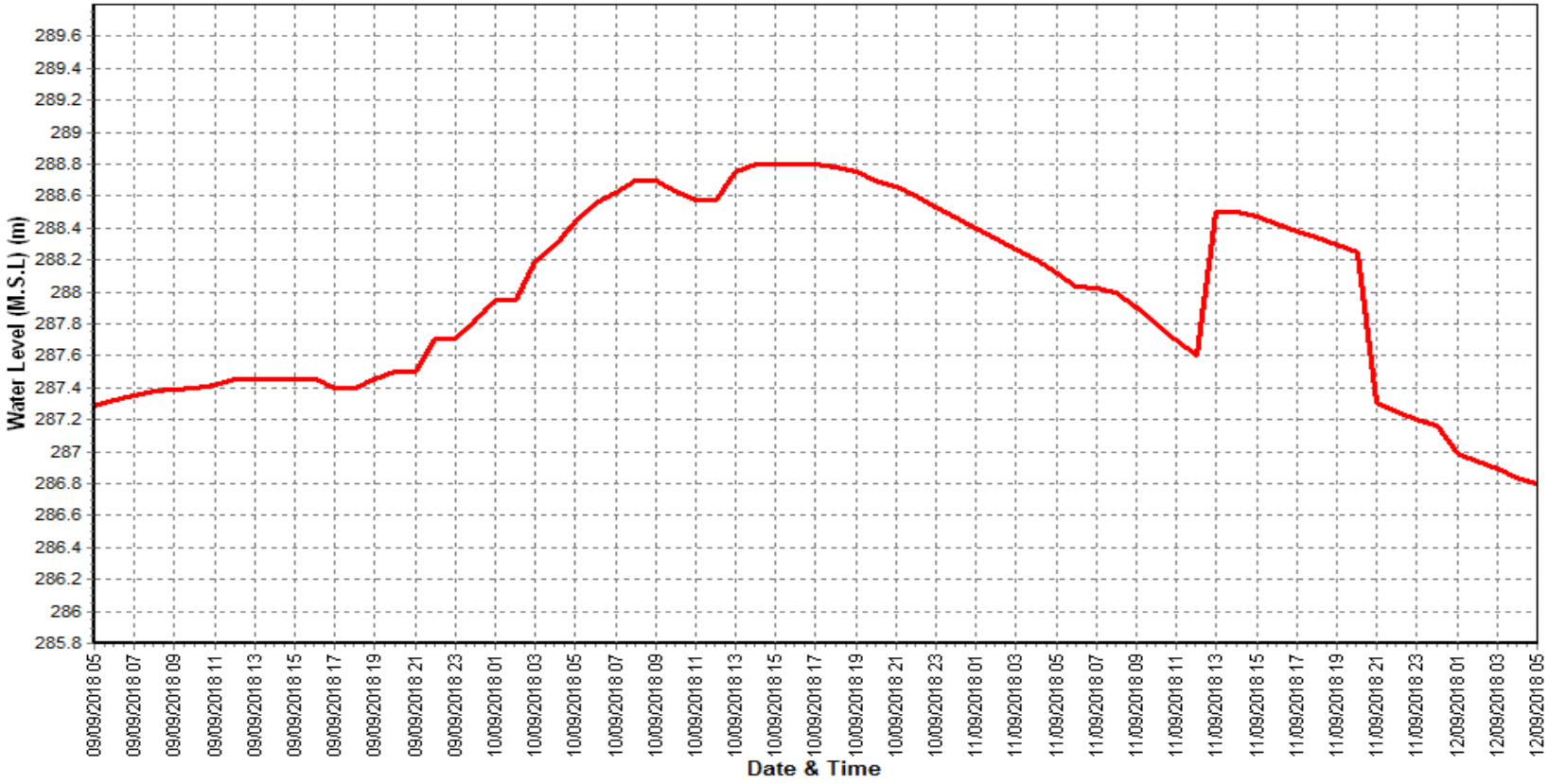
Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



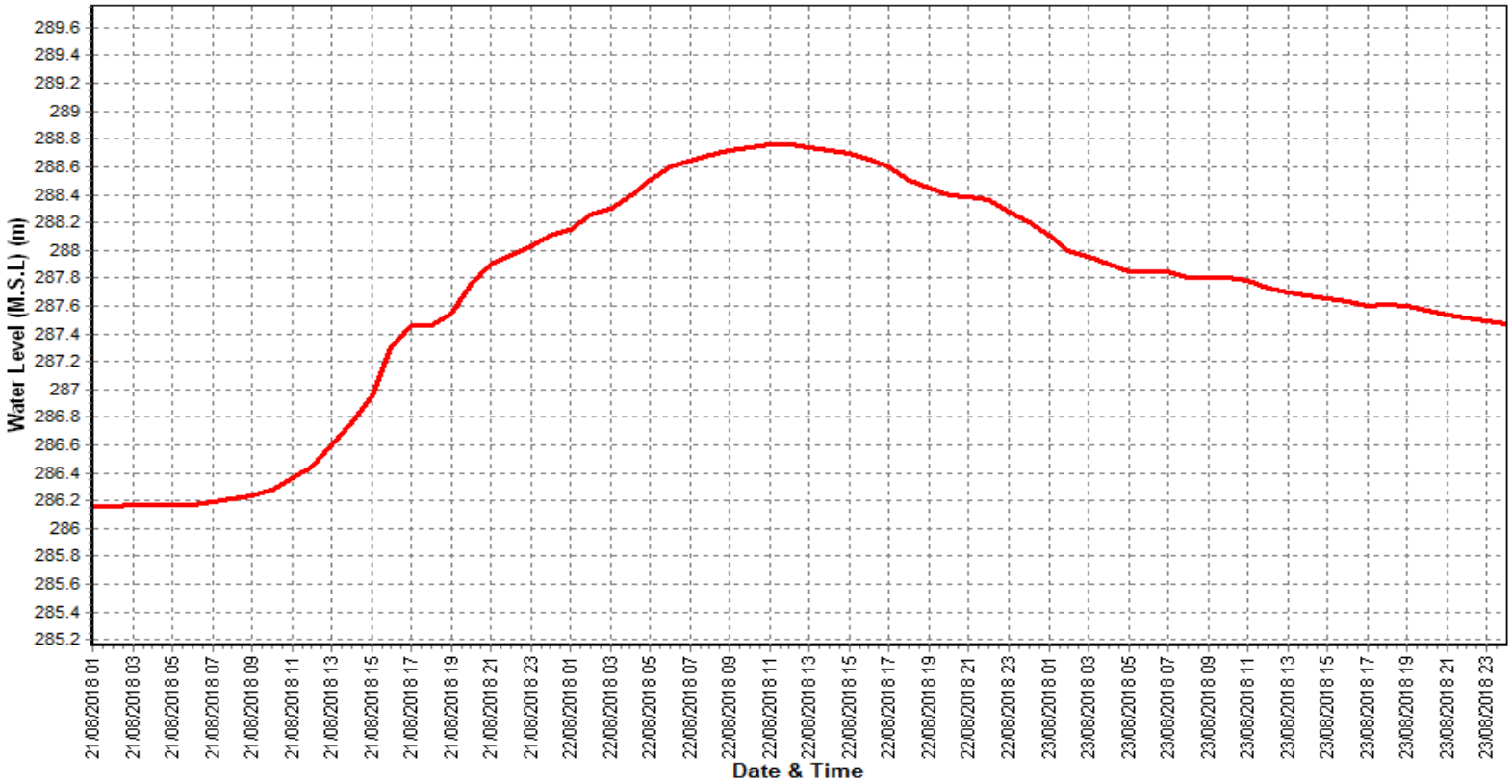
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

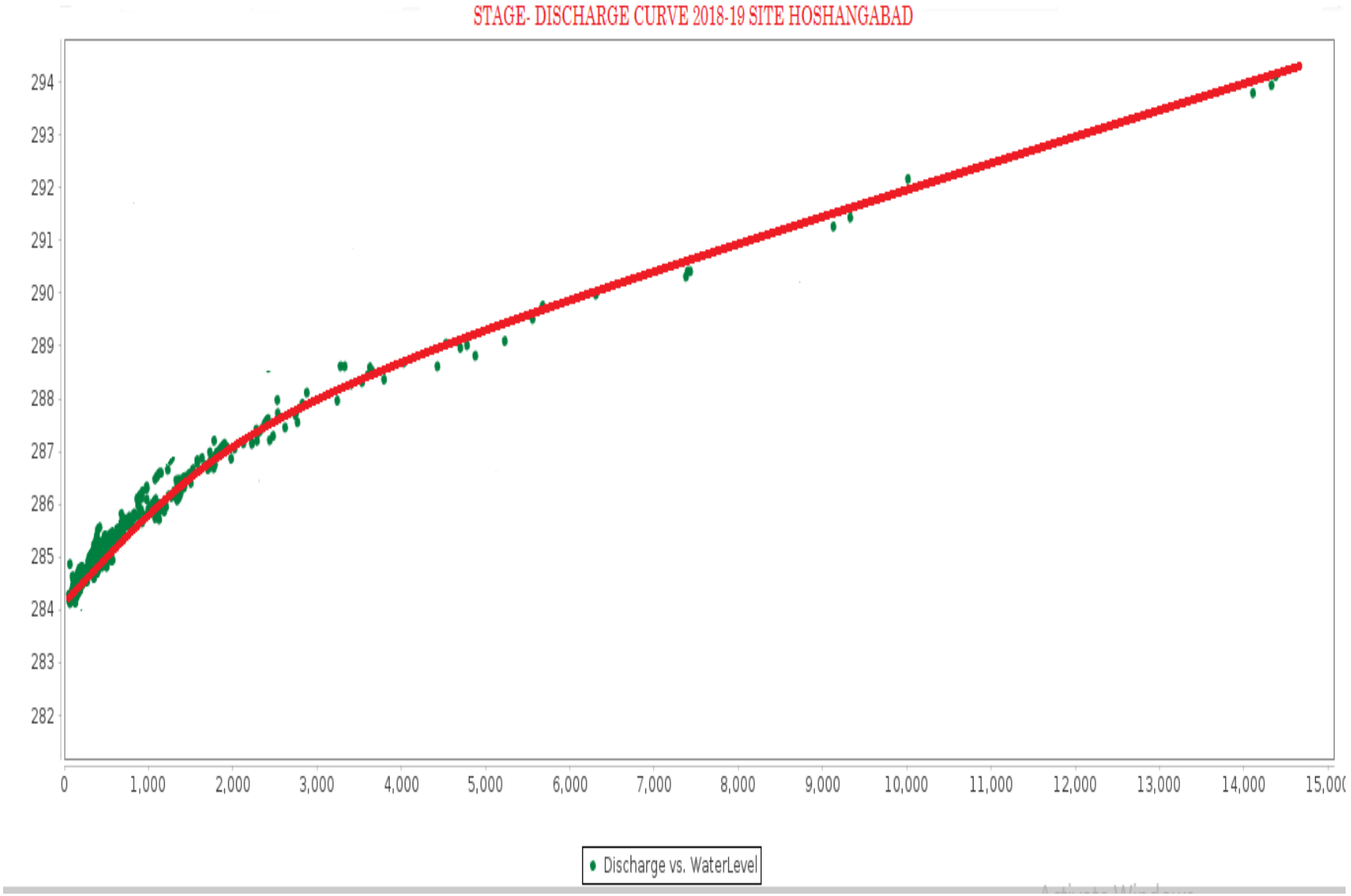
Station Name : Narmada at Hoshangabad (010215019)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad




STAGE- DISCHARGE CURVE 2018-19 SITE HOSHANGABAD
294
293
292
291
290
289
288
287
286
285
284
283
282
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
Discharge vs. WaterLevel

4.8 Narmada at Sandia

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Sandia	**Code**	:	013 NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	33953.5 Sq. Km.	**Bank**	:	Left
Latitude	:	22°54'56''	**Longitude**	:	78°20'50''
Current Zero of Gauge (m)	:	297			

CATEGORY		Opening Date	Closing Date
Gauge	:	01/03/1978	
Discharge	:	18/04/1978	
Sediment	:	09/08/1978	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
297.0	01/03/1978	03/06/2014
297.0	03/06/2014	-

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1977-1978	38.9	299.665	26/04/1978	0	299.845	01/04/1978
1978-1979	8760	311.27	16/08/1978	0	300.715	31/10/1978
1979-1980	5643.9	307.25	11/08/1979	8.7	299.41	19/05/1980
1980-1981	16400	314.9	30/08/1980	10.6	299.42	04/06/1980
1981-1982	3850	306.12	16/08/1981	3	299.5	06/03/1982
1982-1983	6561	308.18	20/08/1982	4.5	299.28	08/07/1982
1983-1984	14500	314.25	09/09/1983	14	299.34	27/05/1984
1984-1985	16500	314.73	19/08/1984	12.6	299.2	03/05/1985
1985-1986	7600	310.85	09/08/1985	15.5	299.25	06/06/1985
1986-1987	5350	310.19	23/07/1986	16.3	299.075	25/05/1987
1987-1988	12466	311.567	17/09/1987	11.54	298.985	31/05/1988
1988-1989	12600	311.575	05/08/1988	9.29	298.965	09/05/1989
1989-1990	6600	307.725	07/08/1989	11	298.94	04/06/1989
1990-1991	7300	308.53	22/09/1990	21.4	299.48	15/06/1990
1991-1992	19700	314.14	25/08/1991	58.89	299.22	08/05/1992
1992-1993	9600	310.06	13/09/1992	44.91	299.21	10/07/1992
1993-1994	7300	308.5	16/07/1993	32.13	299.14	08/06/1993
1994-1995	17275	314	22/07/1994	87.67	299.57	09/06/1994
1995-1996	10040	310.03	11/08/1995	36	298.9	19/05/1996
1996-1997	2210	303.93	27/07/1996	37.94	299.1	08/04/1997
1997-1998	6900	308.6	25/07/1997	33.68	299.09	11/06/1997
1998-1999	4550	305.62	16/09/1998	28.01	299.21	31/05/1999
1999-2000	24500	316.89	19/09/1999	21.5	299.11	06/06/1999
2000-2001	5390	307.4	29/07/2000	38	299.33	21/01/2001
2001-2002	5360	307.66	15/07/2001	52.27	299.57	01/06/2001
2002-2003	11120	311.42	19/08/2002	45	299.3	18/04/2003
2003-2004	9440	309.67	15/09/2003	55	299.35	08/06/2003
2004-2005	10600	311	23/08/2004	71.02	299.4	16/05/2005
2005-2006	10854.85	311.02	06/07/2005	22.57	299.25	23/06/2005
2006-2007	8846.9	309.98	14/08/2006	14.14	299.28	25/06/2006
2007-2008	4110.91	306.1	08/07/2007	34.29	299.52	07/04/2008
2008-2009	5499.45	307.57	02/08/2008	51.46	299.66	21/01/2009
2009-2010	25288.18	314.1	10/09/2009	47.75	299.38	04/04/2010
2010-2011	2142.24	304.21	21/09/2010	67.92	299.24	04/05/2011
2011-2012	8982.61	309.82	09/09/2011	33.35	299.11	28/05/2012
2012-2013	7421.63	308.425	07/08/2012	29.29	299.11	09/06/2012
2013-2014	16259.29	314.05	23/08/2013	65.45	299.3	15/05/2014
2014-2015	4602.13	306.91	08/08/2014	75.02	299.325	18/06/2014

2015-2016	2982.3	305.32	05/08/2015	40.26	299.25	03/03/2016
2016-2017	6517.6	307.58	09/08/2016	57	299.29	12/06/2016
2017-2018	1625.4	303	21/07/2017	0	299.04	01/03/2018
2018-2019	4249	306.41	01/09/2018	28	299.1	29/03/2019

Stage Discharge Sheet for Narmada at Sandia for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.0	299.57	0.0	299.67	490	300.82	4249	306.41
2	0.0	299.57	142.6	299.76	465	300.74	2421	304.25
3	0.0	299.48	149.8	299.79	350	300.59	2100	303.62
4	0.0	299.57	147.1	299.78	324	300.55	1895	302.98
5	0.0	299.55	135.9	299.73	354	300.59	1225	302.7
6	69.7	299.45	127.9	299.7	365	300.62	1320	302.8
7	64.3	299.4	147.9	299.8	308.8	300.43	2070	303.57
8	70.8	299.45	146	299.77	306.1	300.41	2065	303.56
9	0.0	299.45	155.2	299.82	1520	303.25	2950	305.06
10	0.0	299.44	237.1	300.27	1495	300.15	4220	306.33
11	91.2	299.56	193.5	300.11	1050	302	2070	303.57
12	96.6	299.56	179.4	299.99	565	301.21	1200	302.42
13	96	299.55	156.4	299.83	465	301.00	980	302.12
14	72.6	299.45	314	300.52	438	300.96	875	301.75
15	64.1	299.4	289	300.35	433	300.45	580	301.26
16	0.0	299.47	191	300.09	870	301.84	560	301.08
17	0.0	299.52	296	300.32	1130	302.31	530	300.86
18	0.0	0.0	446	300.99	1240	302.77	370	300.78
19	88	299.52	615	301.48	1150	302.38	490	300.7
20	68.2	299.43	595	301.47	975	302.12	475	300.66
21	65.2	299.39	422	300.95	261	304.77	470	300.65
22	0.0	299.48	415	300.65	3135	305.41	472	300.65
23	0.0	299.54	265	300.24	2570	304.6	490	300.86
24	0.0	299.57	575	301.38	2180	303.73	510	300.89
25	0.0	299.54	1165	303.99	1980	303.42	525	300.94
26	0.0	299.54	1550	303.35	1195	302.4	540	301.05
27	87.6	299.46	1480	303.1	755	301.57	530	300.97
28	91.2	299.49	1270	302.79	580	301.46	520	300.87
29	101.9	299.57	931	301.88	2670	304.79	512	300.82
30	109.5	299.6	595	301.36	2595	304.75	510	300.81
31			550	301.12	4200	306.3		
Ten-Daily Mean								
I Ten-Daily	20.48	299.49	138.95	299.81	597.79	300.81	2451.5	304.13
II Ten-Daily	57.67	269.55	327.53	300.51	831.6	301.7	813	301.52
III Ten-Daily	45.54	299.52	838	301.89	2011	303.93	507.9	300.85
Monthly								
Min.	64.1	299.39	127.9	299.67	261	300.15	370	300.65
Max.	109.5	299.6	1550	303.99	4200	306.3	4249	306.41
Mean	41.23	289.52	434.83	300.74	1146.8	302.15	1257.47	302.17

Annual Runoff in MCM : 10169.28 **Annual Runoff in mm : 299.51**

Peak Observed Discharge = 325.1 cumecs on 6/10/2018 Corres. Water Level 300.47 m

Lowest Observed Discharge = 31cumecs on 30/4/2019 Corres. Water Level 299.07 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Sandia for the period 2018-19

Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	505	300.78	148.6	299.88	146	299.7	190	299.9
2	498	300.75	138	299.79	121	299.6	178	299.86
3	498	300.74	135	299.76	96	299.5	190	299.9
4	499	300.71	160	299.88	170	299.82	198	299.93
5	460	300.63	190	300	150	299.74	170	299.83
6	325.1	300.47	191	300	140	299.7	175	299.85
7	262	300.34	192	300	142	299.7	147	299.75
8	219.3	300.13	160	299	148	299.72	113	299.63
9	266.4	300.3	122	299	194	299.88	121	299.66
10	271.5	300.41	110	299.66	180	299.82	122	299.66
11	256	300.35	100	299.58	145	299.7	125	299.67
12	265.9	300.39	100.2	299.58	115	299.58	133	299.7
13	286.7	300.45	100.1	299.59	95	299.5	134	299.7
14	288	300.46	101.1	299.58	145	299.68	133	299.69
15	238.3	300.23	126	299.68	144	299.68	119	299.64
16	242	300.24	130	299.7	143	299.68	133	299.69
17	221	300.15	122	299.65	110	299.55	122	299.65
18	228.2	300.16	117	299.62	61.7	299.51	127	299.67
19	250	300.36	110	299.57	57	299.5	128	299.67
20	246.5	300.26	92	299.45	130	299.74	148	299.74
21	244	300.24	107	299.55	115	299.8	146	299.73
22	224.5	300.26	135	299.66	132	299.75	138	299.7
23	207.2	300.15	155	299.74	152	299.83	97.6	299.72
24	236.4	300.3	195	299.9	170	299.9	94	299.7
25	223.8	300.24	233	300.05	155	299.84	88	299.67
26	238.7	300.29	194	299.9	162	299.87	89	299.67
27	239.7	300.3	130	299.68	145	299.82	88	299.67
28	218	300.19	135	299.7	172	299.93	99.2	299.67
29	219	300.22	105	299.58	190	299.96	101.4	299.73
30	179.7	300.07	147	299.72	150	299.8	88.4	299.66
31	158.1	299.97			170	299.7	84.6	299.63
Ten-Daily Mean								
I Ten-Daily	380.43	300.53	154.66	299.7	148.7	299.72	160.4	299.8
II Ten-Daily	252.26	300.3	109.84	299.6	114.57	299.61	130.2	299.68
III Ten-Daily	217.19	300.2	153.6	299.75	155.73	299.84	101.29	299.69
Monthly								
Min.	158.1	299.97	92	299	57	299.5	84.6	299.63
Max.	505	300.78	233	300.05	194	299.96	198	299.93
Mean	283.29	300.34	139.37	299.68	139.67	299.72	130.63	299.72

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Sandia for the period 2018-19

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	82.1	299.62	64	299.45	37.8	299.21	33.3	299.09
2	71.5	299.55	60	299.43	38.3	299.23	37	299.13
3	86	299.65	54	299.4	54.7	299.36	40	299.15
4	93	299.67	50	299.38	127.8	299.67	39	299.14
5	84	299.63	51	299.38	135.7	299.72	37	299.11
6	81	299.6	71	299.48	145	299.77	38	299.11
7	79	299.59	80	299.53	140	299.73	39	299.13
8	85	299.63	62	299.44	109.8	299.58	34.4	299.11
9	82	299.62	68	299.47	60	299.37	32.3	299.08
10	81	299.6	140	299.83	56.7	299.25	31.6	299.08
11	82	299.6	128	299.77	44.3	299.19	32	299.08
12	86	299.63	102	299.64	39.4	299.15	36	299.12
13	98	299.68	108	299.67	32	299.1	36.7	299.14
14	106	299.72	112	299.69	35	299.15	44	299.18
15	97	299.68	86	299.56	42.1	299.22	43	299.18
16	98	299.68	54	299.4	42.5	299.22	41.7	299.17
17	95	299.67	46	299.36	45	299.25	36.7	299.14
18	96.4	299.62	42	299.34	38	299.21	36	299.14
19	80.8	299.53	41	299.34	35	299.19	43	299.19
20	74	299.52	42	299.34	34	299.19	42.5	299.19
21	100	299.64	36	299.31	40	299.22	38.7	299.14
22	88	299.58	30	299.28	38.6	299.21	34.9	299.1
23	78	299.53	32	299.28	35.2	299.17	41.7	299.16
24	98	299.63	33	299.28	32.2	299.08	46.3	299.21
25	114	299.71	36	299.3	30	299.07	42	299.19
26	120	299.73	40	299.32	33	299.13	38	299.14
27	110	299.68	32	299.24	43.5	299.17	39	299.15
28	86	299.56	29	299.11	38	299.15	39	299.15
29			28	299.1	32	299.11	38.7	299.14
30			30	299.12	31	299.07	36.4	299.13
31			33	299.14			32.2	299.11
I Ten-Daily	82.46	299.62	70	299.48	90.58	299.49	36.16	299.11
II Ten-Daily	91.32	299.63	76.1	299.51	38.73	299.19	39.16	299.15
III Ten-Daily	99.25	299.63	32.64	299.23	35.35	299.14	38.81	299.15
Monthly								
Min.	71.5	299.52	28	299.1	30	299.07	31.6	299.08
Max.	120	299.73	140	299.83	145	299.77	46.3	299.21
Mean	91.01	299.63	59.58	299.41	54.89	299.27	38.04	299.14

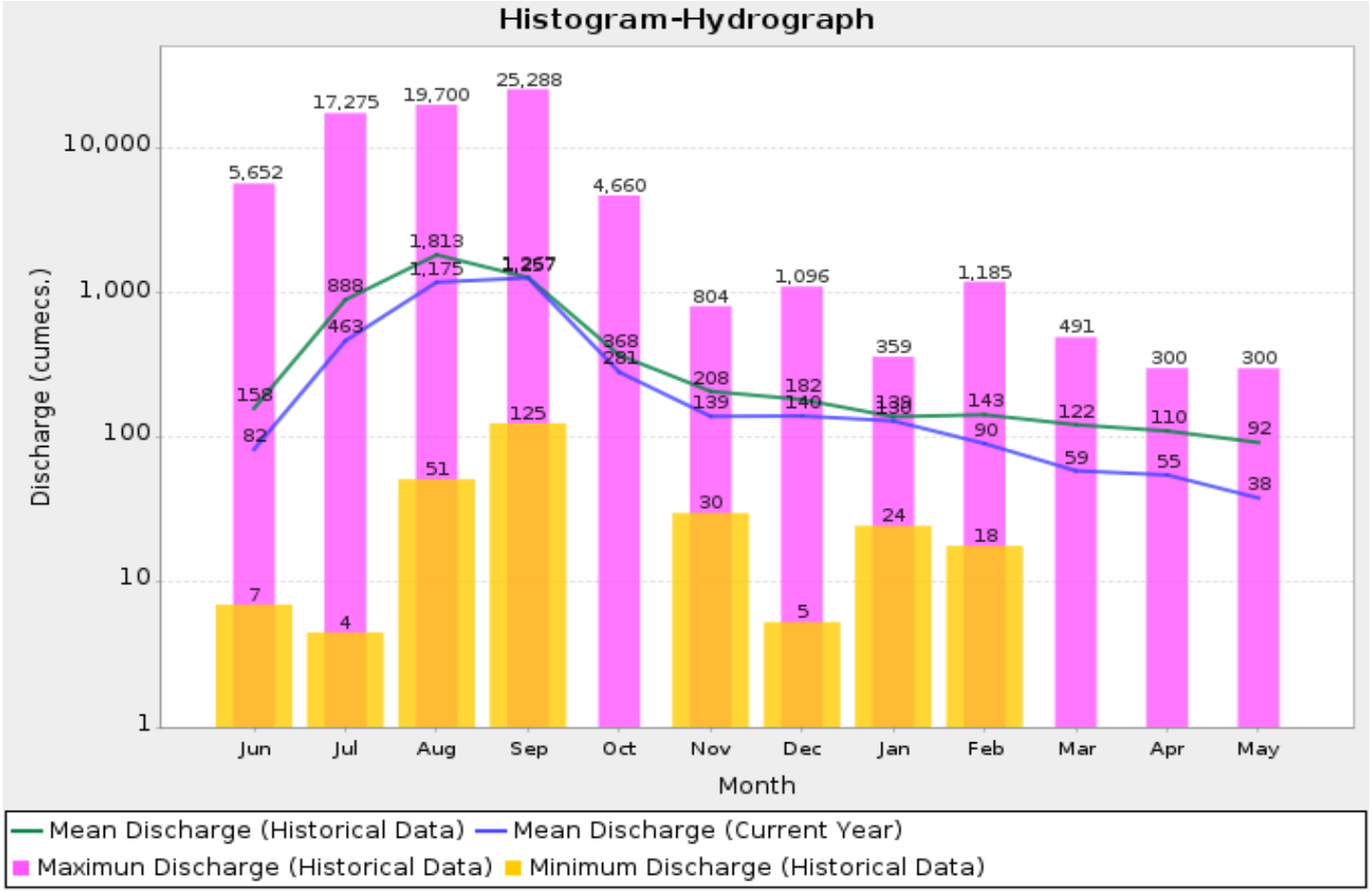
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram - Hydrograph for Water Year : 2018-19 (Data considered : 1978-2019)

Station Name : Narmada at Sandia (010215013) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



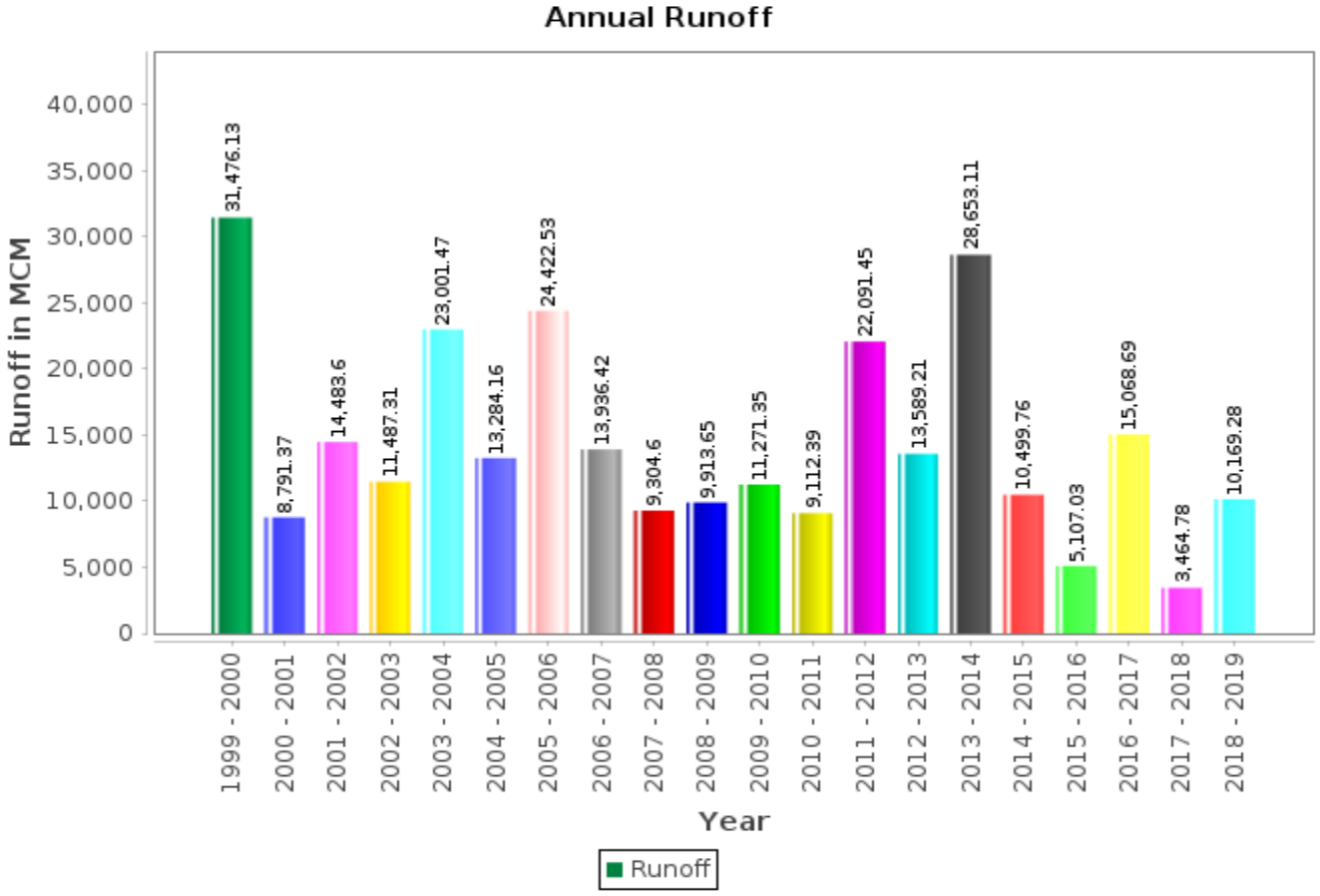
Annual Runoff Values for the period (1978 – 2019)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



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

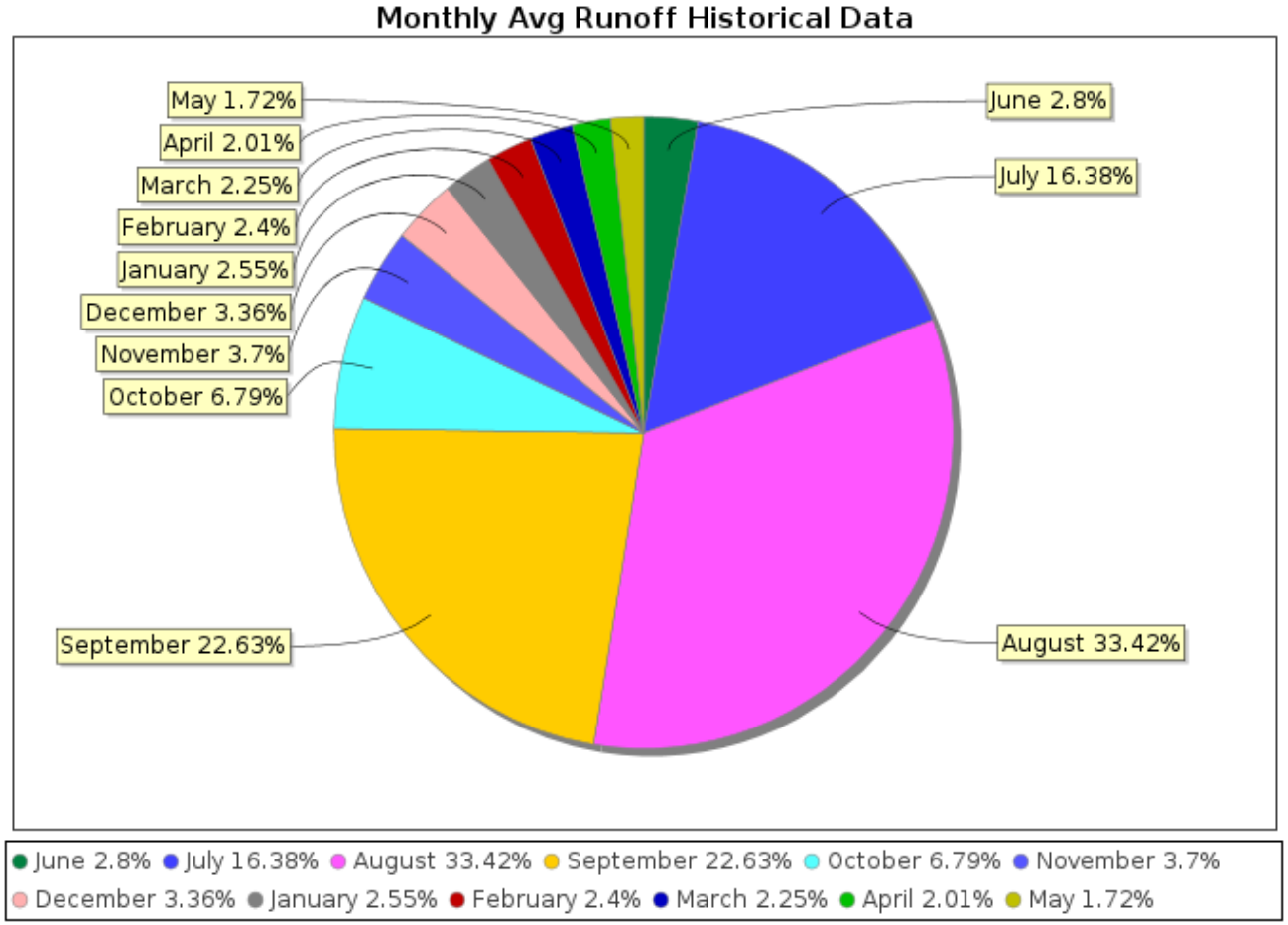
Monthly Average Runoff based on period (1978-2019)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



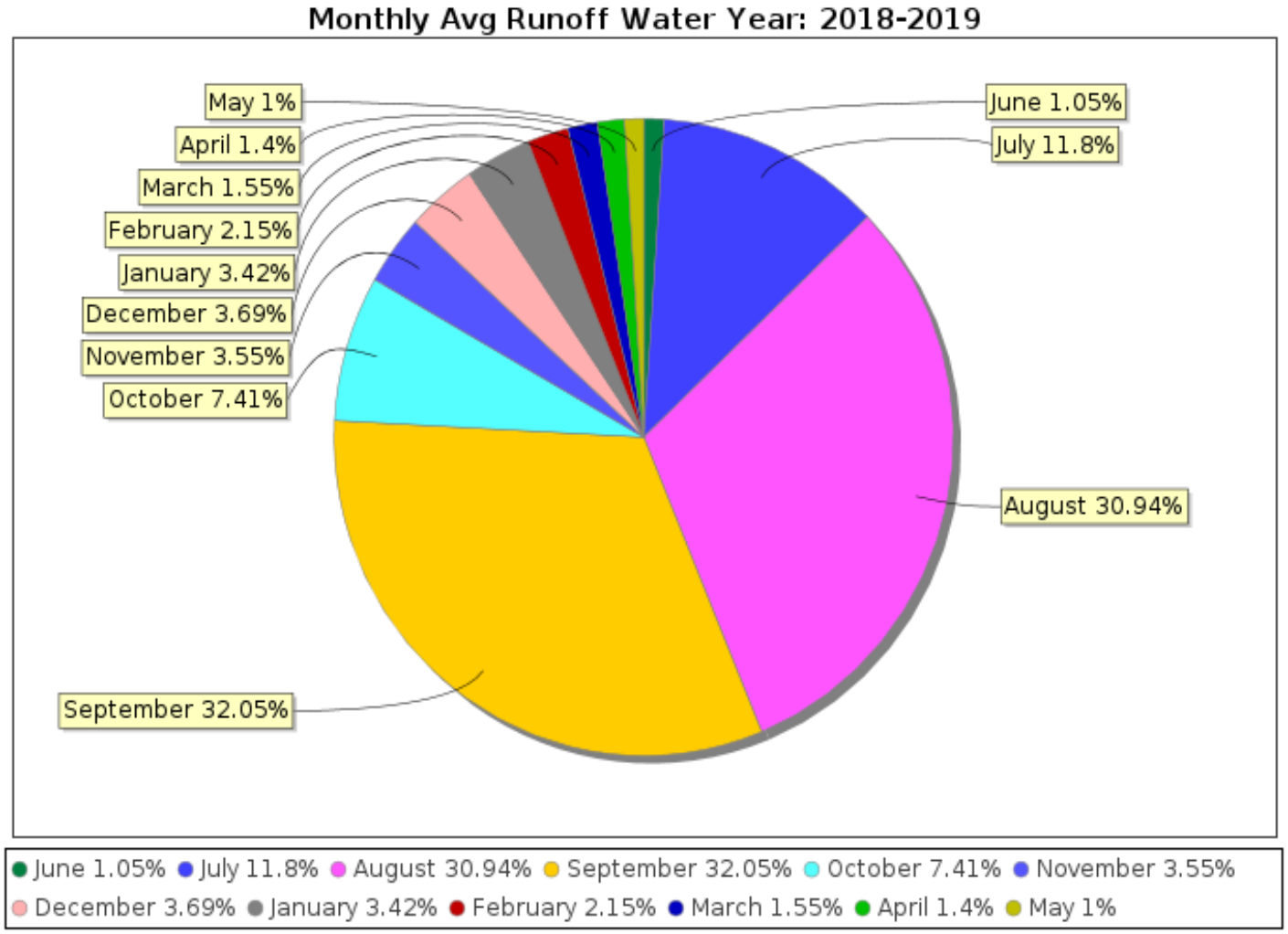
Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad

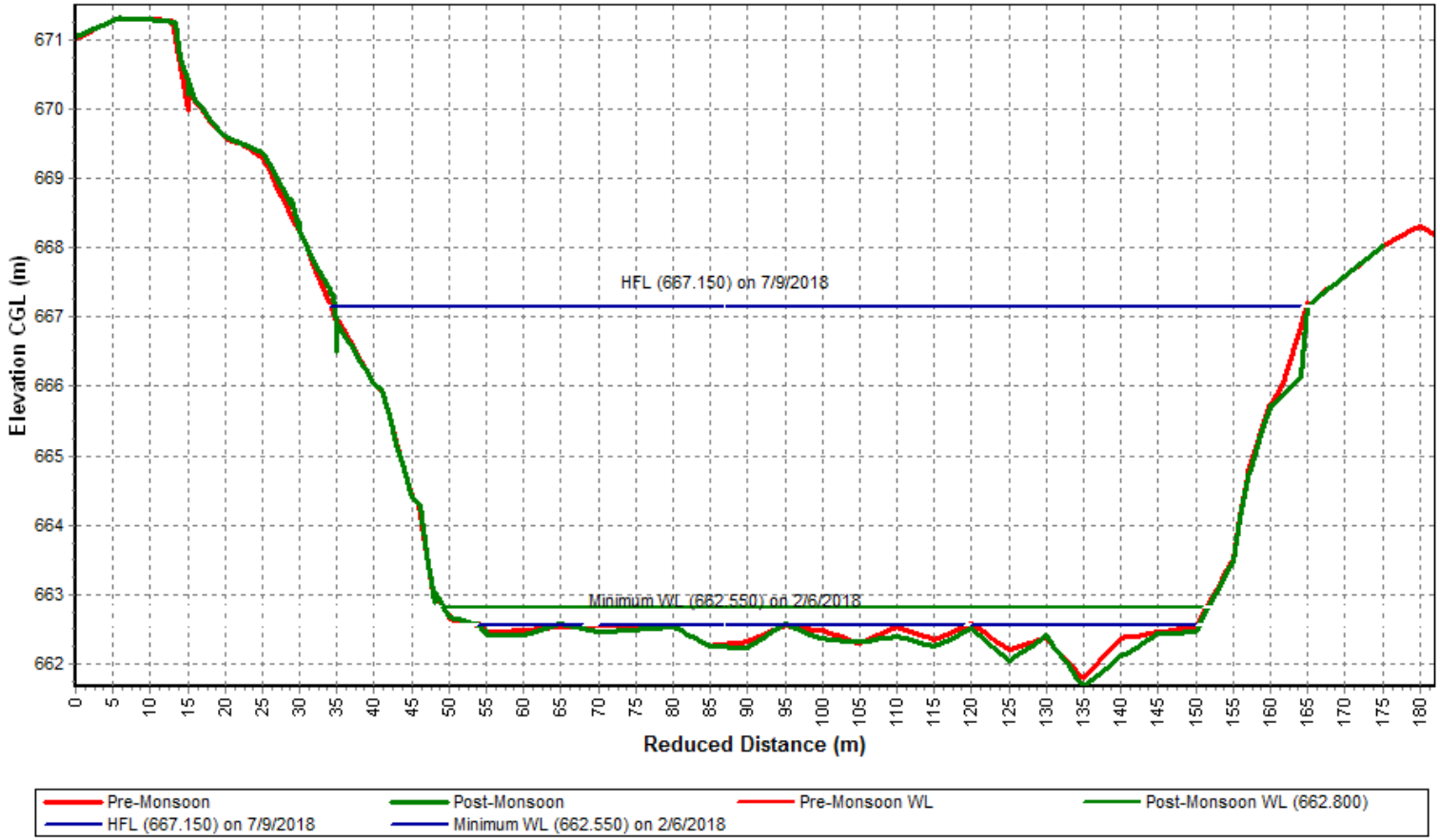


Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Sandia (010215013) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



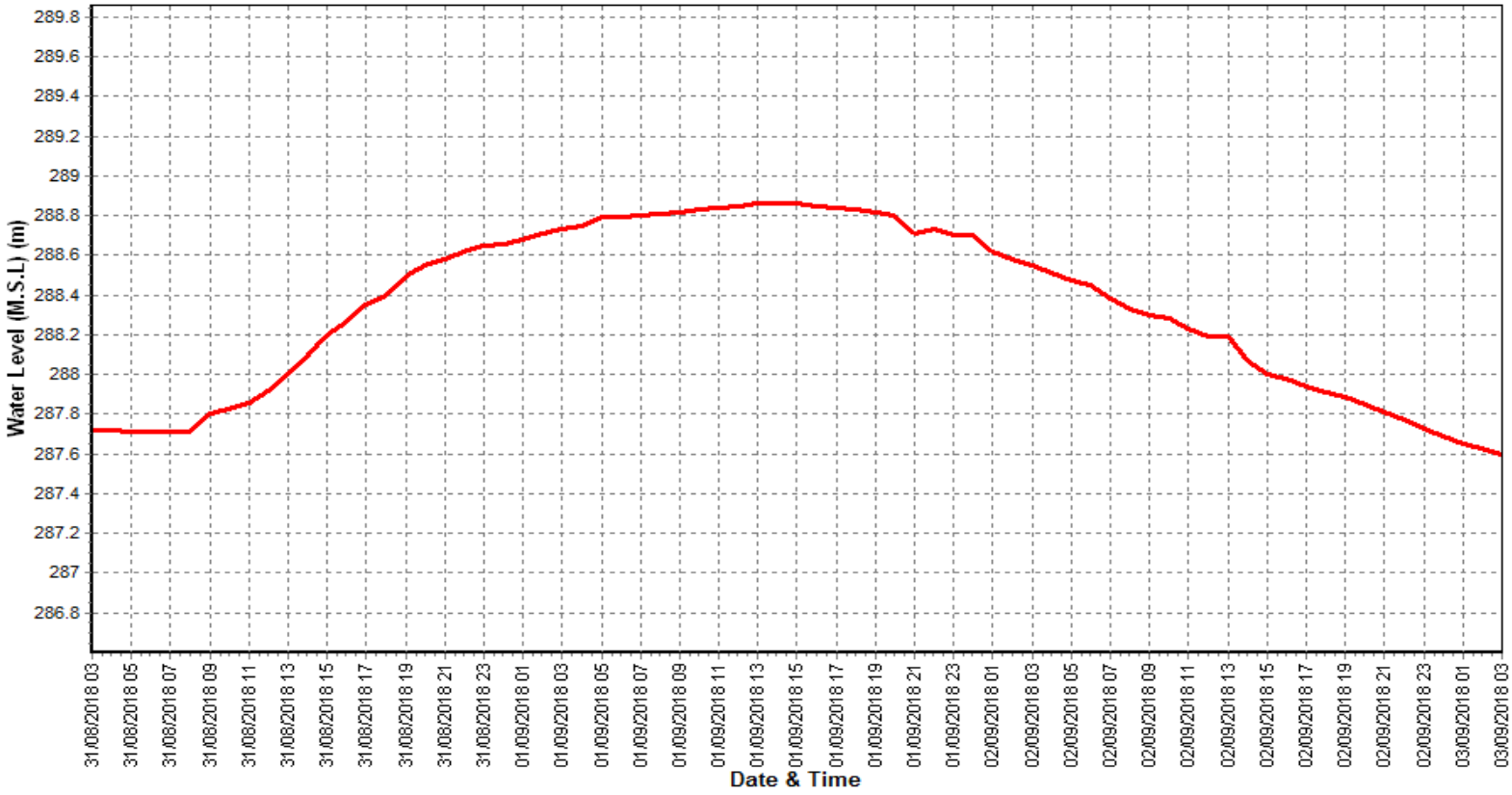
Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



Water

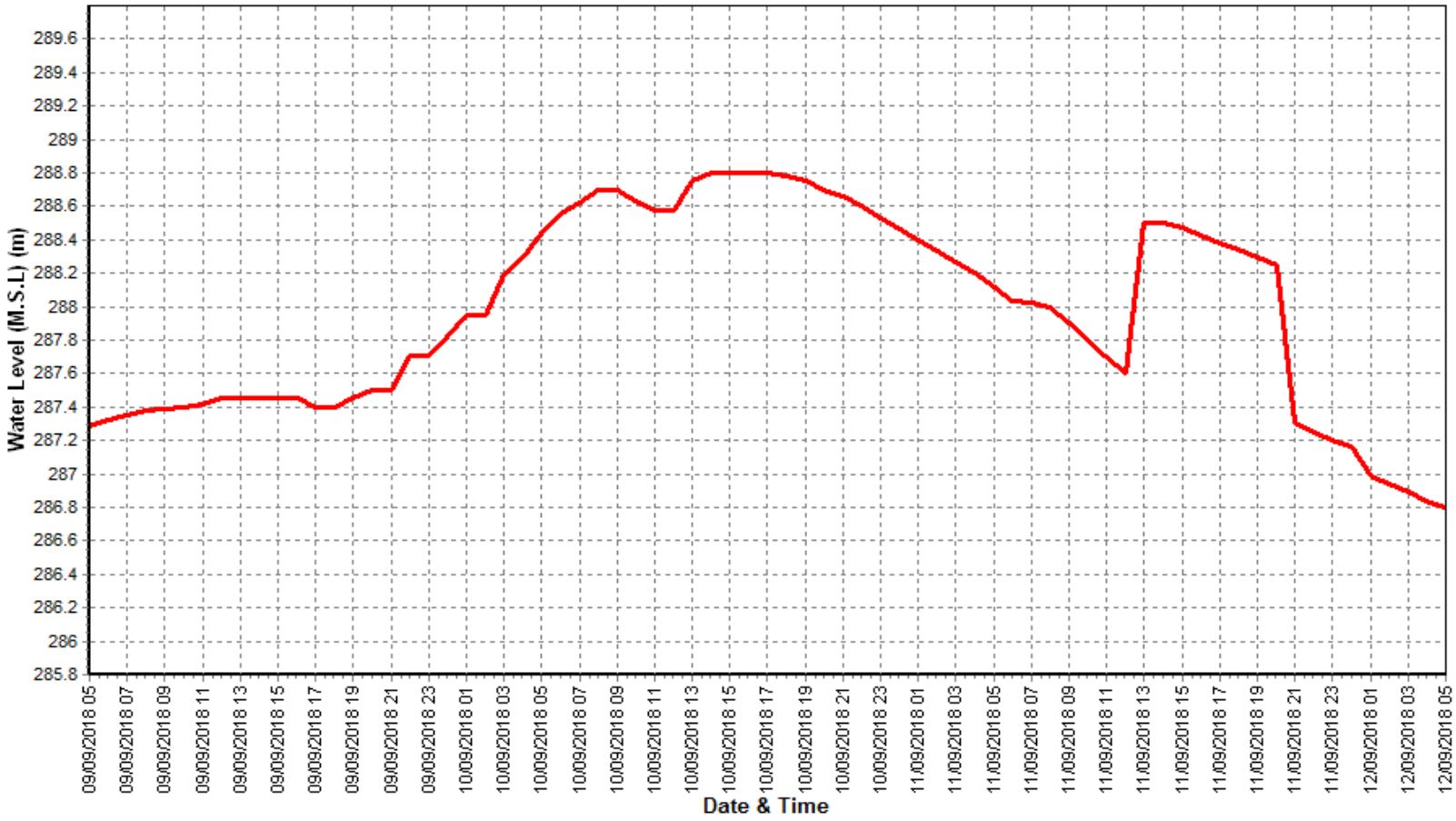
Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Sandia (010215013)

Division : Narmada Division, Bhopal

Local River : Narmada

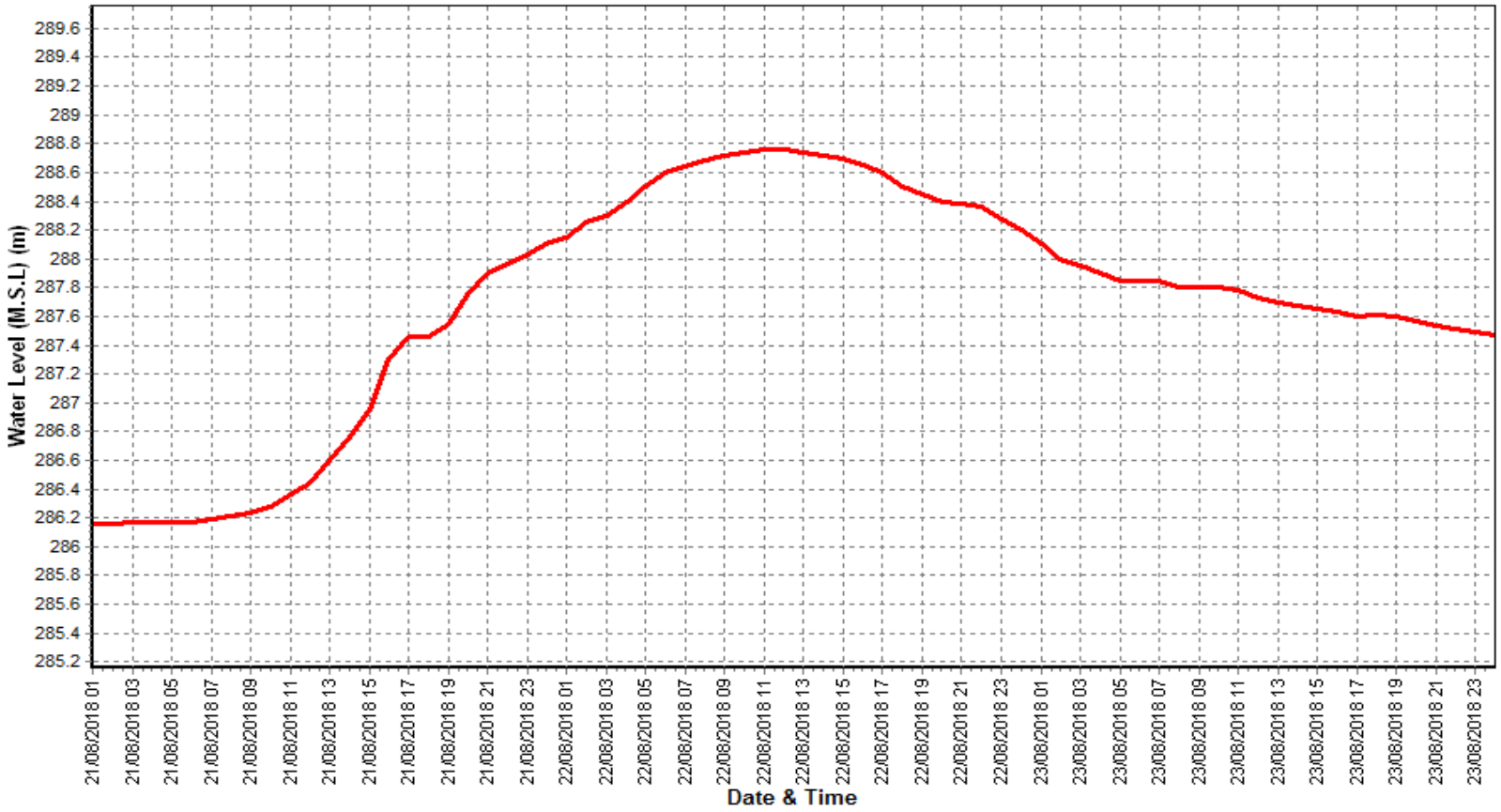
Sub-Division : MNSD I, CWC Hoshangabad

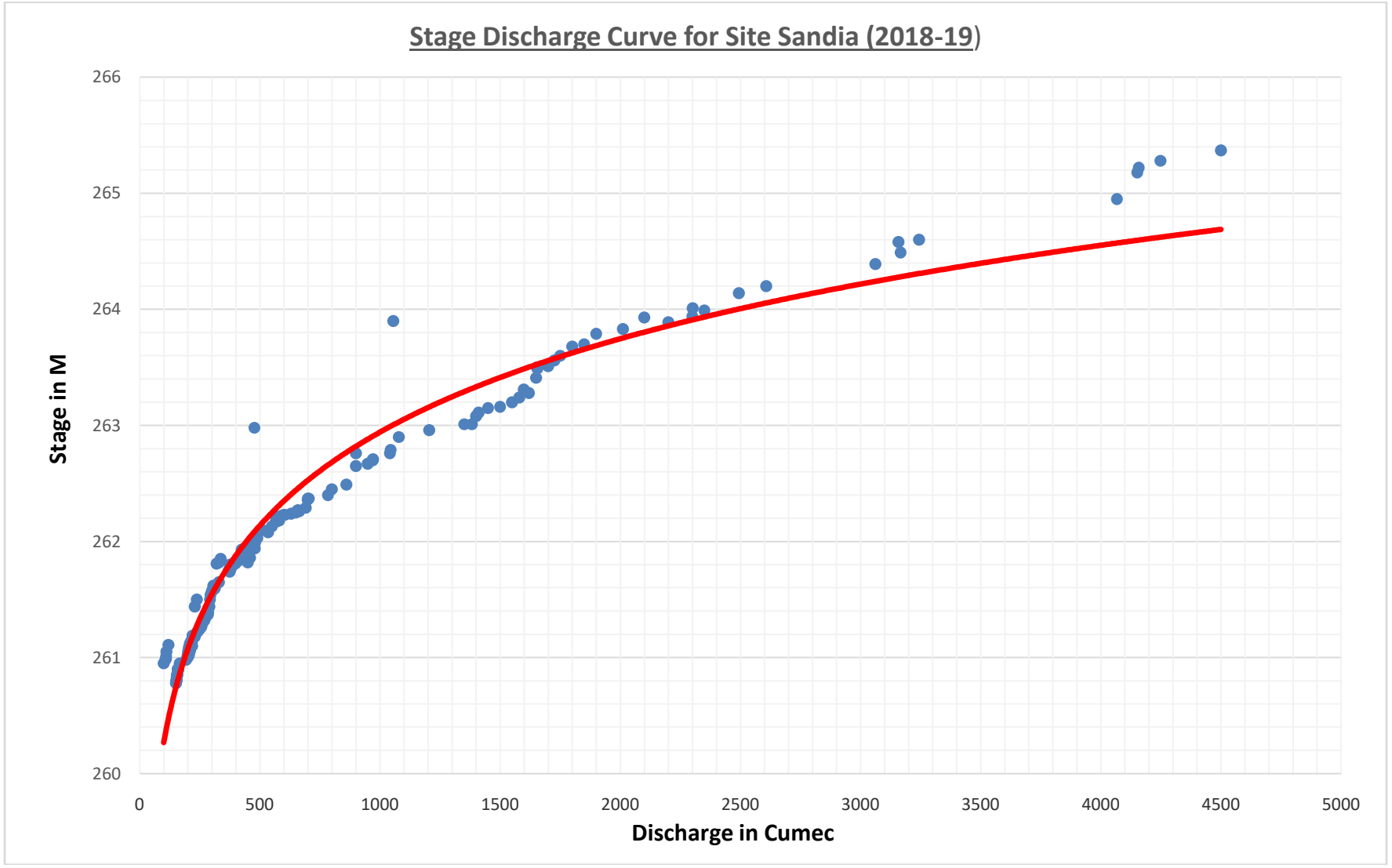


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Sandia (010215013) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad




Stage Discharge Curve for Site Sandia (2018-19)
Stage in M
266
265
264
263
262
261
260
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Discharge in Cumec

4.9 Shakkar at Gadarwara

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Gadarwara	**Code**	:	019-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Shakkar
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	2270.0 Sq. Km.	**Bank**	:	Left
Latitude	:	22°55'26''	**Longitude**	:	78°47'30''
Current Zero of Gauge (m)	:	321			

CATEGORY		Opening Date	Closing Date
Gauge	:	01/02/1977	
Discharge	:	01/02/1977	
Sediment	:	15/06/1978	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
321.0	05/01/2017	-
321.0	14/10/2016	05/01/2017
321.0	01/02/1977	14/10/2016

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	0	0	21/02/1972	0	0	21/02/1972
1976-1977	28	322.705	03/02/1977	1.7	322.605	12/04/1977
1977-1978	2734.6	328.175	07/08/1977	1.6	322.59	01/06/1977
1978-1979	2890	328.58	16/08/1978	2.4	322.85	31/05/1979
1979-1980	1430.8	327.41	09/08/1979	1	322.62	04/04/1980
1980-1981	2822.9	328.81	29/08/1980	0.9	322.635	30/11/1980
1981-1982	724	325.47	24/06/1981	1.2	322.68	08/06/1981
1982-1983	3031	328.745	20/08/1982	1.2	322.82	11/06/1982
1983-1984	2335	328.82	08/09/1983	1.6	322.875	08/06/1983
1984-1985	2850	329.6	18/08/1984	1.2	322.92	30/05/1985
1985-1986	1930	327.85	08/08/1985	1	322.86	23/06/1985
1986-1987	2680	329.8	14/08/1986	1.6	322.89	19/06/1986
1987-1988	1450	326.985	08/09/1987	1	322.93	30/05/1988
1988-1989	2400	328.81	03/08/1988	0.94	322.85	31/05/1989
1989-1990	1605	327.3	16/08/1989	0.8	322.84	12/06/1989
1990-1991	2300	328.4	05/09/1990	1.08	322.995	11/06/1990
1991-1992	1046	326.32	19/08/1991	1.06	322.925	07/07/1991
1992-1993	1590	327.4	20/08/1992	1.2	322.92	10/07/1992
1993-1994	1880	328.15	16/07/1993	1.73	322.915	06/06/1993
1994-1995	2720	330.18	19/08/1994	1.7	322.96	29/05/1995
1995-1996	1160	326.65	25/07/1995	0.25	322.62	30/05/1996
1996-1997	608	325.15	27/07/1996	0	322.47	22/04/1997
1997-1998	1732	328	25/07/1997	0	0	01/06/1997
1998-1999	836	326	05/07/1998	0.25	323.05	28/06/1998
1999-2000	5850	332.47	18/09/1999	0.15	322.81	21/05/2000
2000-2001	1310	327.1	28/07/2000	0.85	322.81	06/06/2000
2001-2002	1030	326.48	19/07/2001	0.5	322.63	27/05/2002
2002-2003	2750	328.85	06/09/2002	0.3	322.9	30/05/2003
2003-2004	2700	328.45	24/07/2003	0.21	322.87	15/06/2003
2004-2005	940	327.1	22/08/2004	0.11	322.77	29/05/2005
2005-2006	1828.4	326.25	01/08/2005	0.02	322.72	19/06/2005
2006-2007	4650.38	329	14/08/2006	0.01	323.13	19/05/2007
2007-2008	3279.69	329	08/07/2007	0	0	31/05/2008
2008-2009	237.39	324.25	05/08/2008	0.04	322.79	02/02/2009
2009-2010	3278.58	329.88	09/09/2009	0	0	01/06/2009
2010-2011	901.36	325.7	07/08/2010	0	0	01/06/2010

2011-2012	736.19	324.6	15/07/2011	0	0	06/06/2011
2012-2013	1866	326.35	21/08/2012	0	0	21/04/2013
2013-2014	2898.65	328.58	23/08/2013	0	0	01/06/2013
2014-2015	554.43	325.23	23/07/2014	0.16	322.33	31/05/2015
2015-2016	493.83	324.54	14/08/2015	0.01	322.23	03/03/2016
2016-2017	10138	323.72	26/10/2016	0	0	02/05/2017
2017-2018	468.7	324.54	21/07/2017	0	321	02/06/2017
2018-2019	433.28	324.42	08/09/2018	0.06	0	16/01/2019

Stage Discharge Sheet for Shakkar at Gadarwara for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.00	0.00	9.48	322.66	55.55	323.4	197.7	323.92
2	0.00	0.00	7.26	322.7	53.88	323.39	407.8	324.35
3	0.00	0.00	9.77	322.86	49.71	323.36	338.29	324.13
4	0.00	0.00	11.86	322.89	43.45	323.33	206.21	323.94
5	0.00	0.00	8.47	322.8	32.21	323.31	184.35	323.86
6	0.00	0.00	11.64	322.88	43.88	323.33	198.93	323.92
7	0.00	0.00	11.46	322.87	33.8	323.31	377.73	324.33
8	0.00	0.00	11.64	322.88	70.64	323.47	433.28	324.42
9	0.00	0.00	11.93	322.9	111.24	323.61	208.5	323.95
10	0.00	0.00	12.16	322.98	162.17	323.75	184.91	323.86
11	0.00	0.00	11.83	643.89	162.16	323.75	169.85	323.78
12	0.00	0.00	12.43	322.12	130	323.68	169.36	323.78
13	0.00	0.00	12.21	322.1	111.33	323.61	169.8	323.8
14	0.00	0.00	11.94	322.96	116.49	323.63	158.6	323.73
15	0.00	0.00	11.93	322.9	130	323.68	129.98	323.68
16	0.00	0.00	11.85	322.89	155.24	323.72	105	323.59
17	0.00	0.00	12.18	323.06	124.01	323.66	77.11	323.5
18	0.00	0.00	13.28	323.18	139.24	323.7	60.37	323.42
19	0.00	0.00	14.02	323.2	133	323.69	51.17	323.36
20	0.00	0.00	12.52	323.13	155.4	323.72	42.46	323.32
21	0.00	0.00	12.44	323.12	376.6	324.33	32	323.3
22	0.00	0.00	14	323.2	370.5	324.2	43.89	323.33
23	0.00	0.00	13.84	323.19	183.42	323.86	124	324.66
24	0.00	0.00	14.06	323.2	173.06	323.82	102.55	323.58
25	0.00	0.00	76.67	323.5	184.76	323.86	96.52	323.55
26	0.00	0.00	70.39	323.47	170.1	323.77	76.73	323.5
27	0.00	0.00	171.65	323.82	164.71	323.76	70.54	323.47
28	0.00	0.00	190.5	323.91	184.48	323.86	64.78	323.44
29	0.00	0.00	181.53	323.85	163.73	323.76	54.17	324.38
30	0.00	0.00	161.13	323.75	123.92	323.66	54.15	323.38
31	0.00	0.00	59.69	323.42	169.88	323.8		
Ten-Daily Mean								
I Ten-Daily	0	0	10.57	322.84	65.65	323.43	273.77	324.07
II Ten-Daily	0	0	12.42	354.94	135.69	323.68	113.37	323.6
III Ten-Daily	0	0	87.81	323.49	205.92	323.88	71.93	323.66
Monthly								
Min.	0	0	7.26	322.1	32.21	323.31	32	323.3
Max.	0	0	190.5	643.89	376.6	324.33	433.28	324.66
Mean	0	0	36.93	333.76	135.75	323.66	153.02	323.77

Annual Runoff in MCM : 917.54 **Annual Runoff in mm : 404.2**

Peak Observed Discharge = 433.28 cumecs on 8/9/2018 Corres. Water Level 324.42 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Shakkar at Gadarwara for the period 2018-19

Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.17	323.38	2.96	322.34	1	322.15	0.12	0.00
2	47.5	323.35	2.9	322.33	0.85	322.14	0.00	0.00
3	44.25	323.33	2.85	322.32	0.7	322.13	0.00	0.00
4	42.8	323.32	2.85	322.32	0.7	322.13	0.00	0.00
5	34.37	323.3	2.8	322.31	0.55	322.13	0.00	0.00
6	29.74	323.28	2.8	322.31	0.55	322.12	0.00	0.00
7	23.8	323.06	2.75	322.3	0.4	322.11	0.1	0.00
8	23.81	323.26	2.75	322.3	0.3	322.1	0.00	0.00
9	26.27	323.27	2.7	322.29	0.3	322.1	0.00	0.00
10	18.88	323.24	2.65	322.28	0.2	322.09	0.00	0.00
11	13.49	323.19	2.65	322.28	0.2	322.09	0.08	0.00
12	12.58	323.13	2.53	322.27	0.2	322.09	0.00	0.00
13	12.12	323.09	2.53	322.27	0.2	322.09	0.00	0.00
14	11.65	323.04	2.4	322.26	0.2	322.09	0.00	0.00
15	11.3	322.99	2.4	322.26	0.2	322.09	0.06	0.00
16	11.15	322.96	2.26	322.25	0.2	322.09	0.06	0.00
17	11.09	322.91	2.2	322.24	0.18	322.07	0.00	0.00
18	11.64	322.88	2.2	322.24	0.16	322.06	0.00	0.00
19	10.75	322.87	2.1	322.23	0.16	322.06	0.00	0.00
20	10.49	322.86	2.1	322.23	0.16	322.06	0.00	0.00
21	9.8	322.85	2	322.22	0.16	322.06	0.00	0.00
22	7.74	322.75	1.85	322.19	0.16	322.06	0.00	0.00
23	7.42	322.7	1.85	322.19	0.16	322.06	0.00	0.00
24	6.84	322.61	1.85	322.19	0.14	322.05	0.00	0.00
25	6.84	322.64	1.85	322.19	0.14	322.05	0.00	0.00
26	5.68	322.6	1.7	322.18	0.14	322.05	0.00	0.00
27	5.11	322.58	1.7	322.18	0.14	322.05	0.00	0.00
28	4.15	322.52	1.5	322.17	0.14	322.05	0.00	0.00
29	3.51	322.5	1.25	322.16	0.14	322.05	0.00	0.00
30	3.28	322.38	1	322.15	0.14	322.05	0.00	0.00
31	3.04	322.35			0.12	322.04	0.00	0.00
Ten-Daily Mean								
I Ten-Daily	29.76	323.28	2.8	322.31	0.55	322.12	0.02	0
II Ten-Daily	11.62	322.99	2.34	322.25	0.19	322.08	0.02	0
III Ten-Daily	5.77	322.59	1.65	322.18	0.14	322.05	0	0
Monthly								
Min.	3.04	322.35	1	322.15	0.12	322.04	0.06	0
Max.	47.5	323.38	2.96	322.34	1	322.15	0.12	0
Mean	15.72	322.95	2.26	322.25	0.29	322.08	0.01	0

Peak Computed Discharge = 407.8 cumecs on 2/9/2018 Corres. Water Level 324.35 m

Lowest Computed Discharge = 0.12cumecs on 31/12/2018 Corres. Water Level 322.04 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

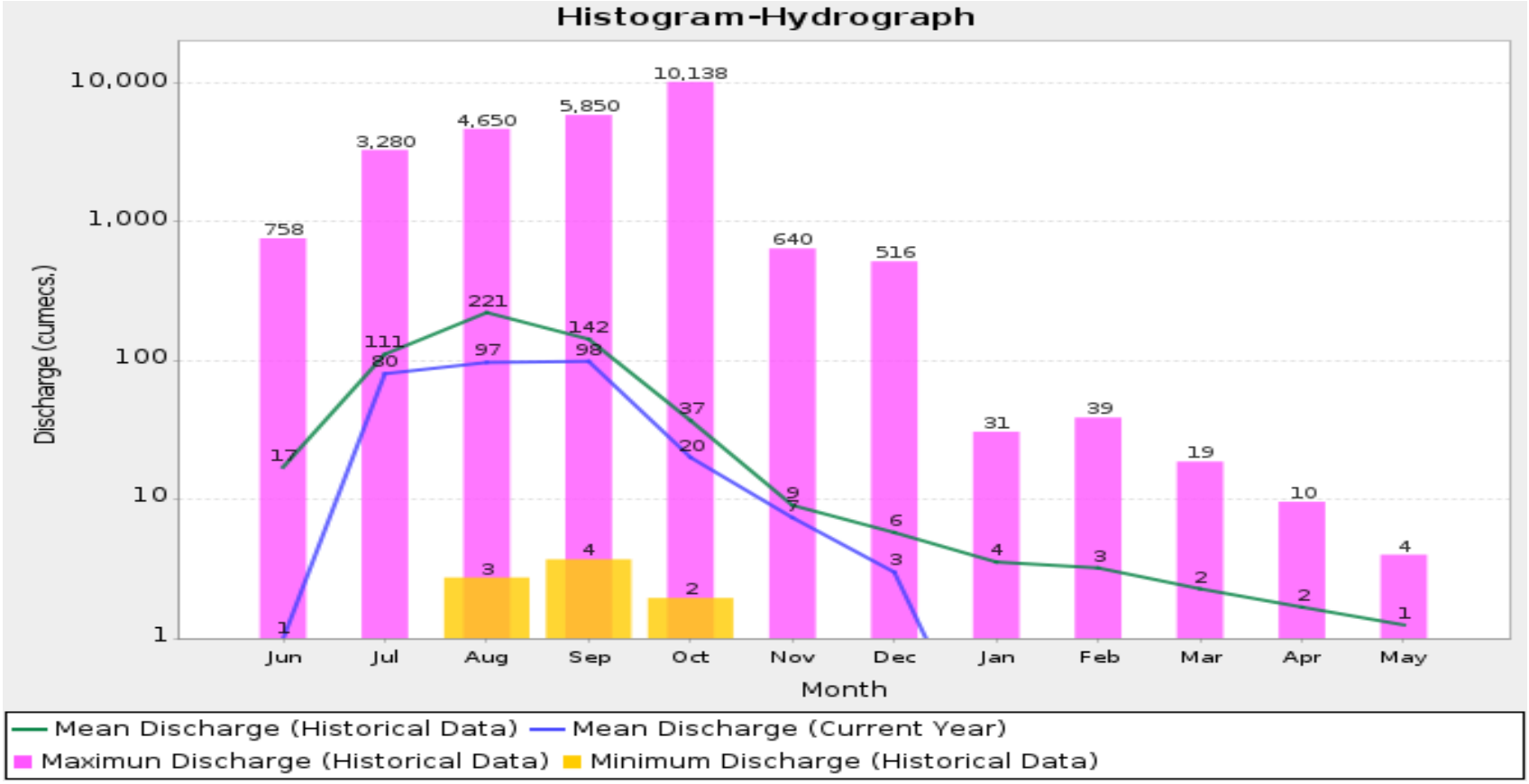
Stage Discharge Sheet for Shakkar at Gadarwara for the period 2018-19

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ten-Daily Mean								
I Ten-Daily	0	0	0	0	0	0	0	0
II Ten-Daily	0	0	0	0	0	0	0	0
III Ten-Daily	0	0	0	0	0	0	0	0
Monthly								
Min.	0	0	0	0	0	0	0	0
Max.	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0

Histogram - Hydrograph for Water Year : 2018-19 (Data considered : 1977-2019)

Station Name : Shakkar at Gadarwara (010215012) Division : Narmada Division, Bhopal

Local River : Shakkar Sub-Division : MNSD I, CWC Hoshangabad



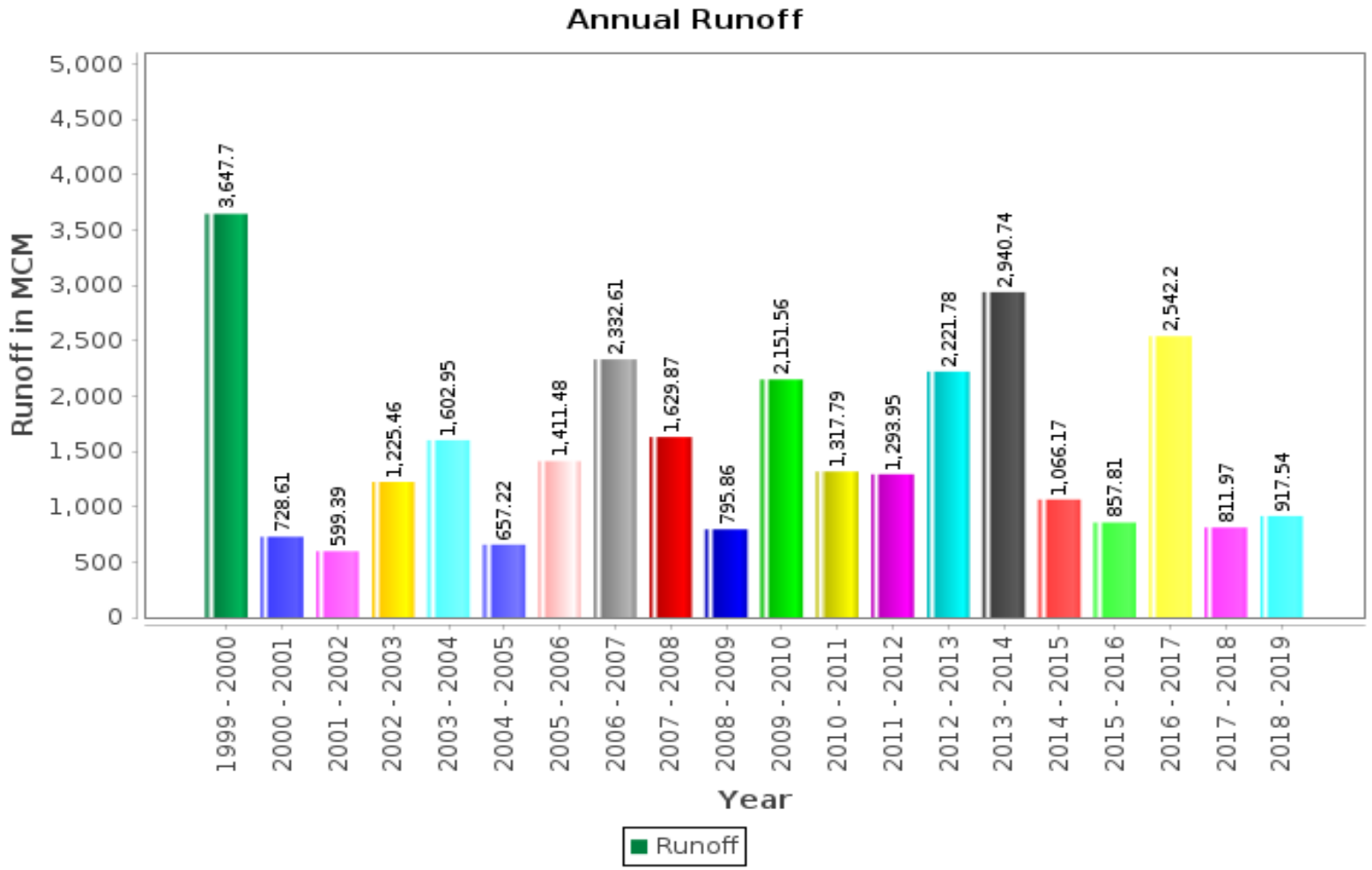
Annual Runoff Values for the period (1977 – 2019)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



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

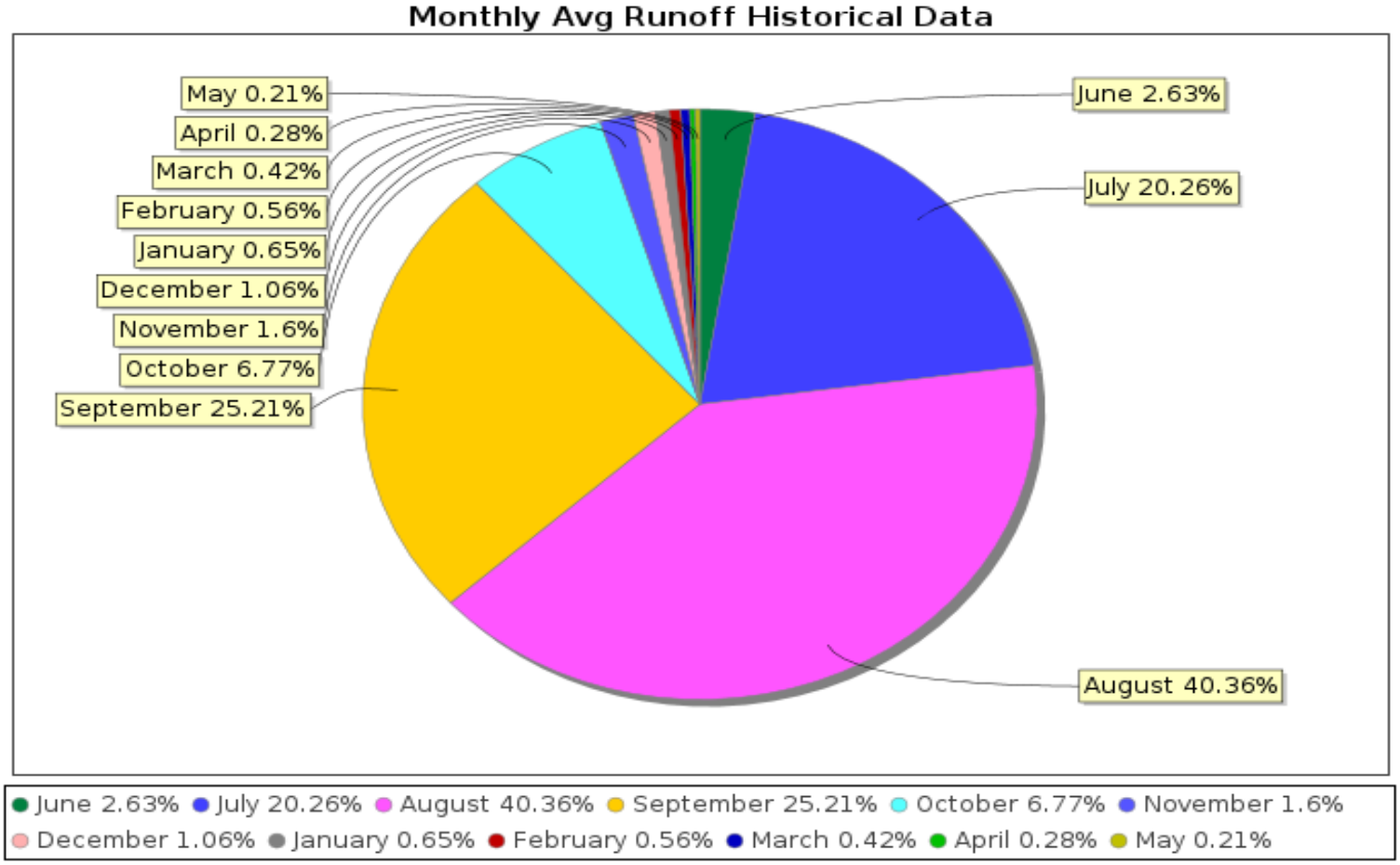
Monthly Average Runoff based on period (1977 – 2019)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



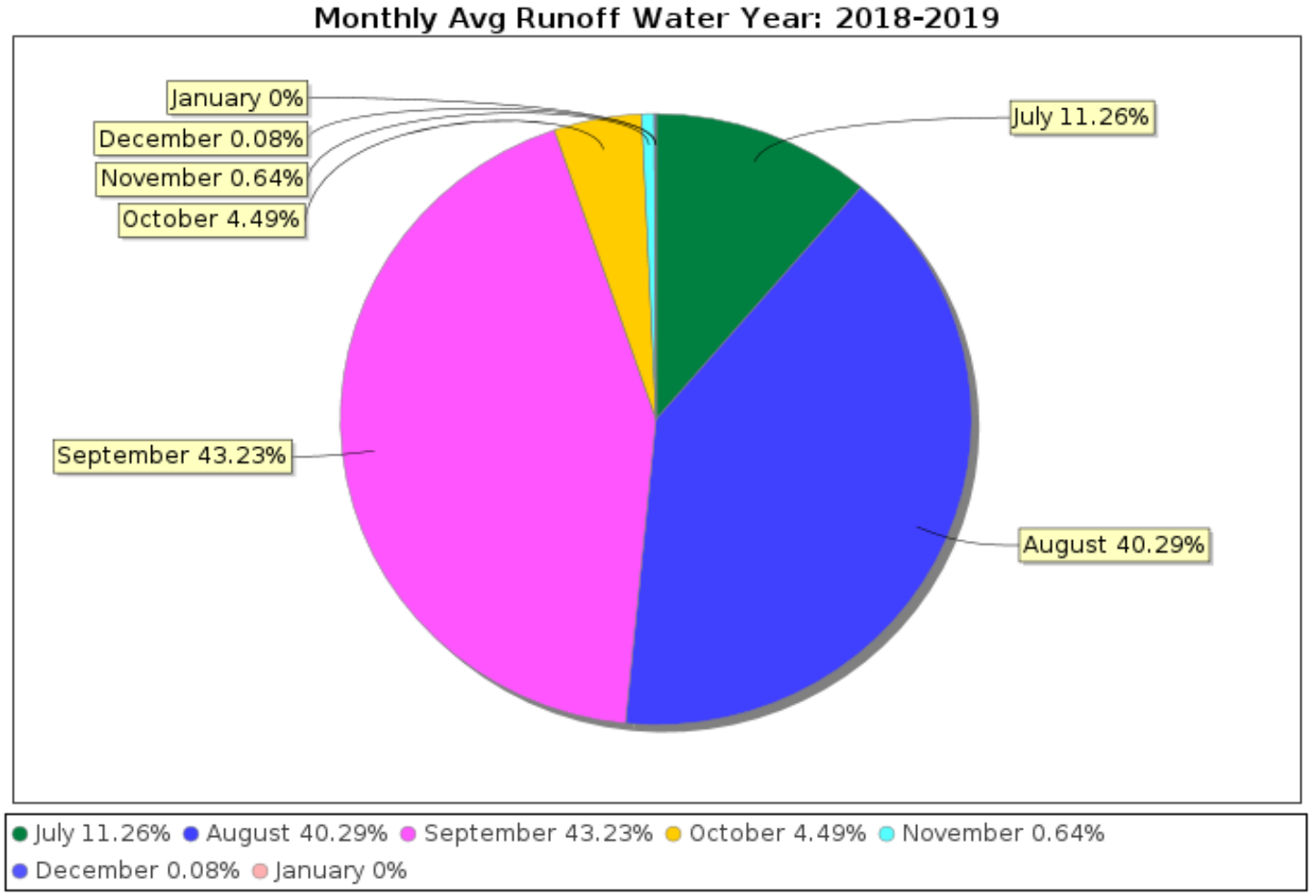
Monthly Runoff for the Year (2018-19)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



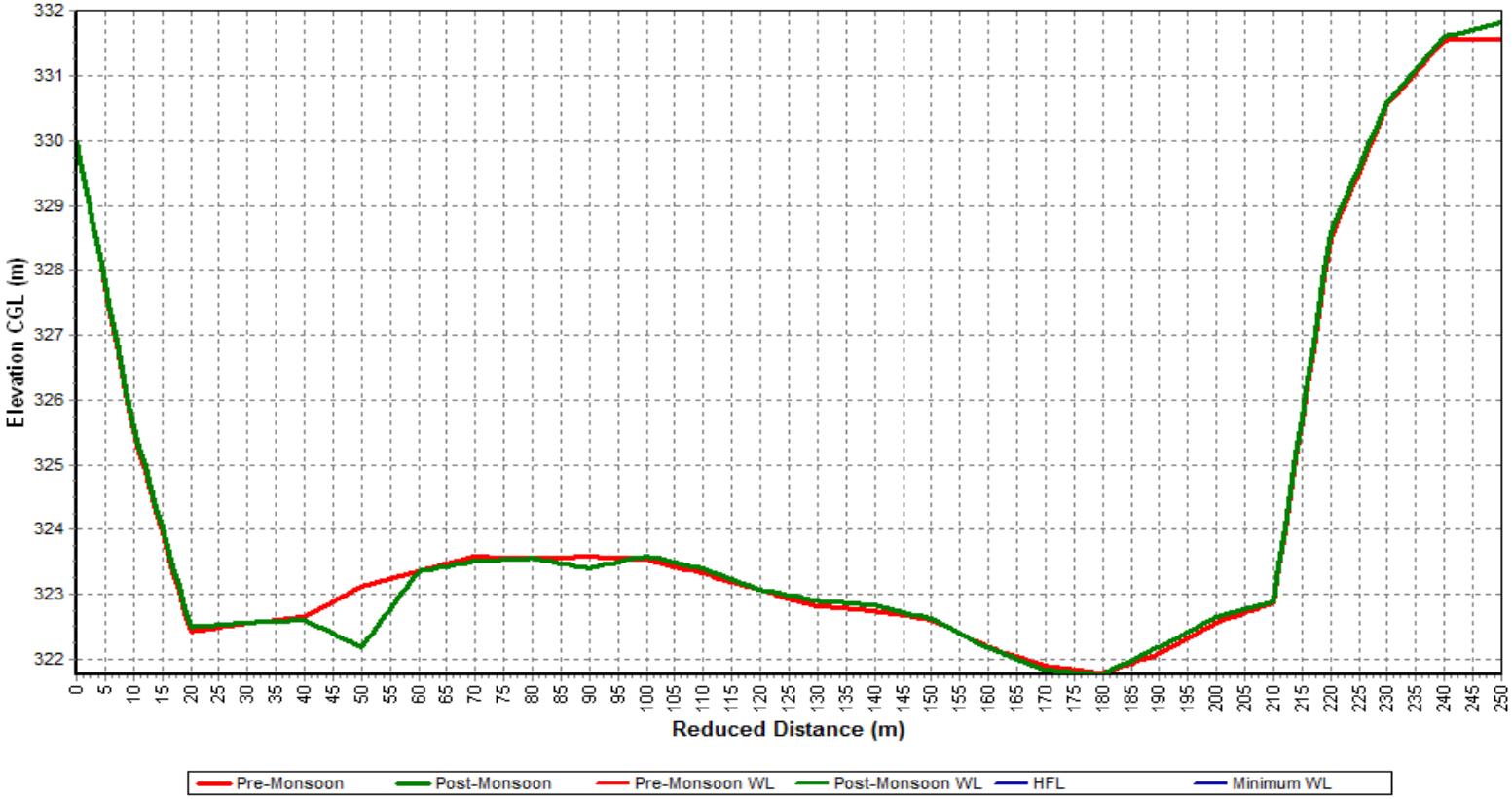
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



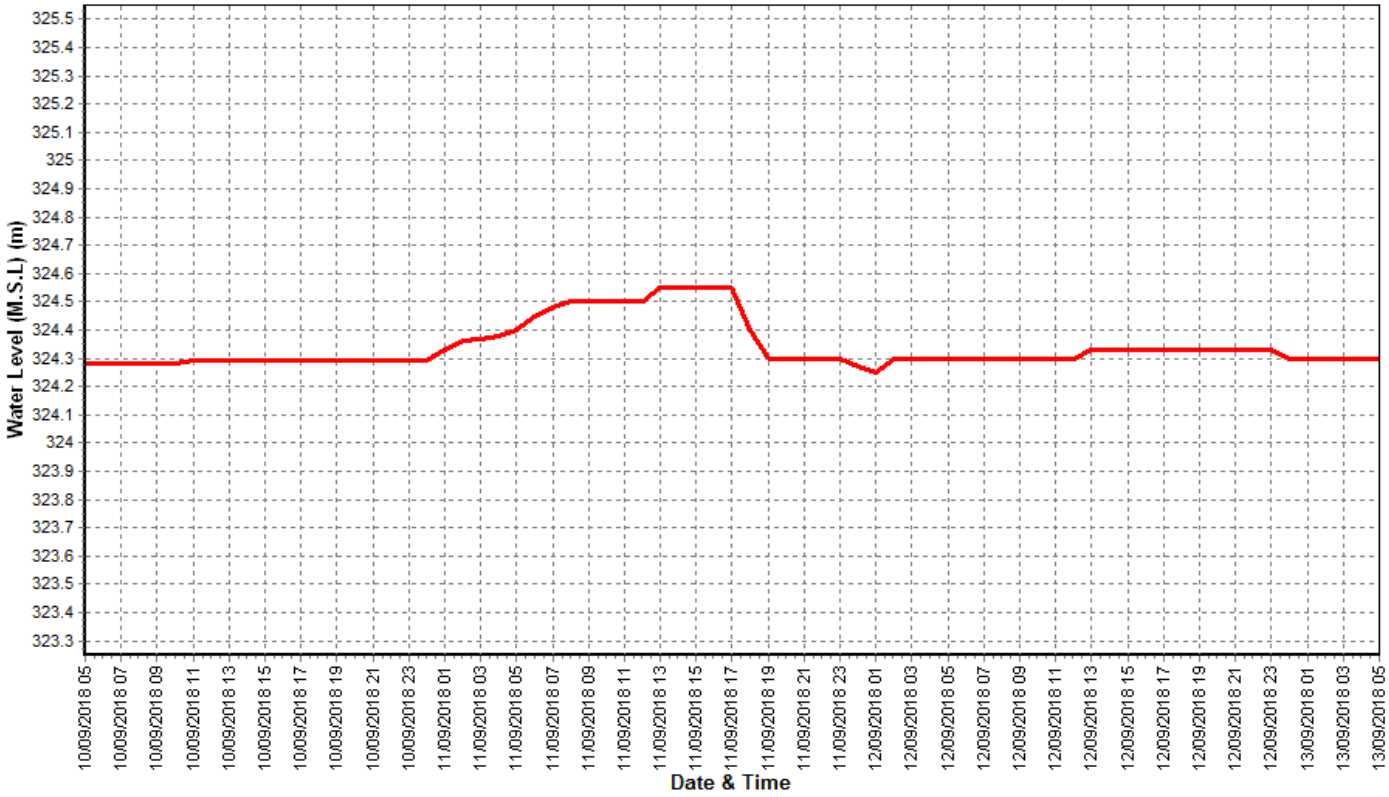
Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



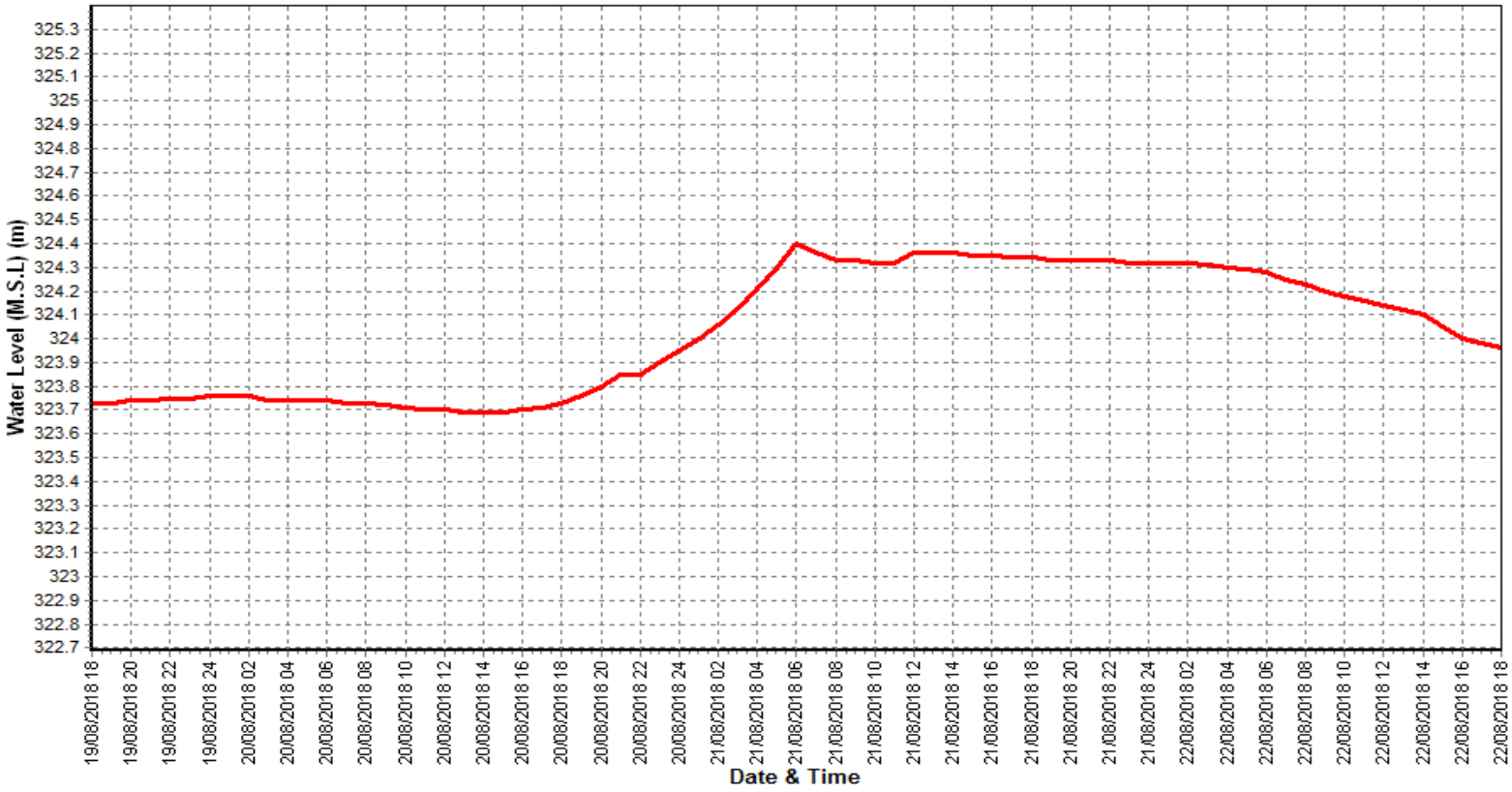
Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad



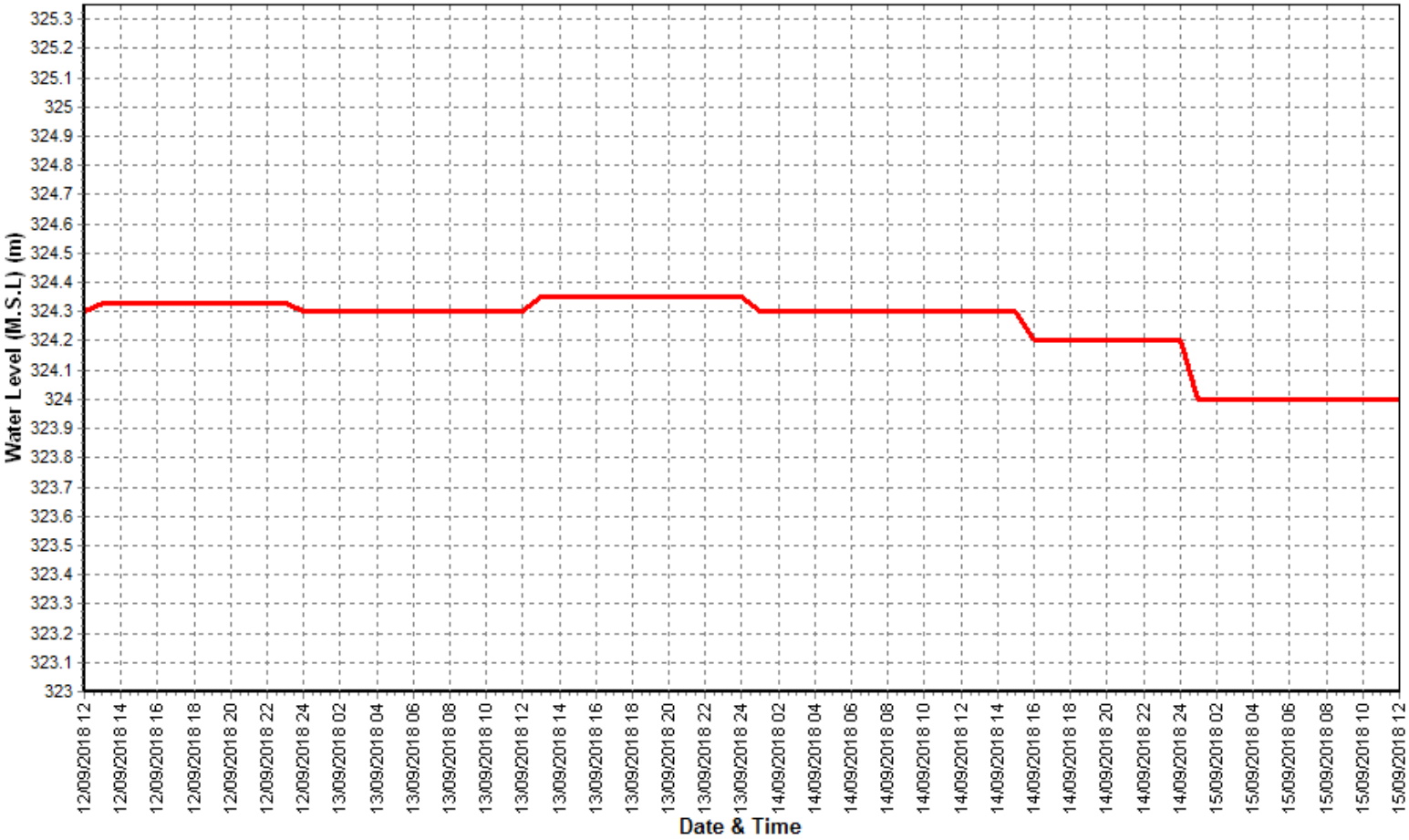
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

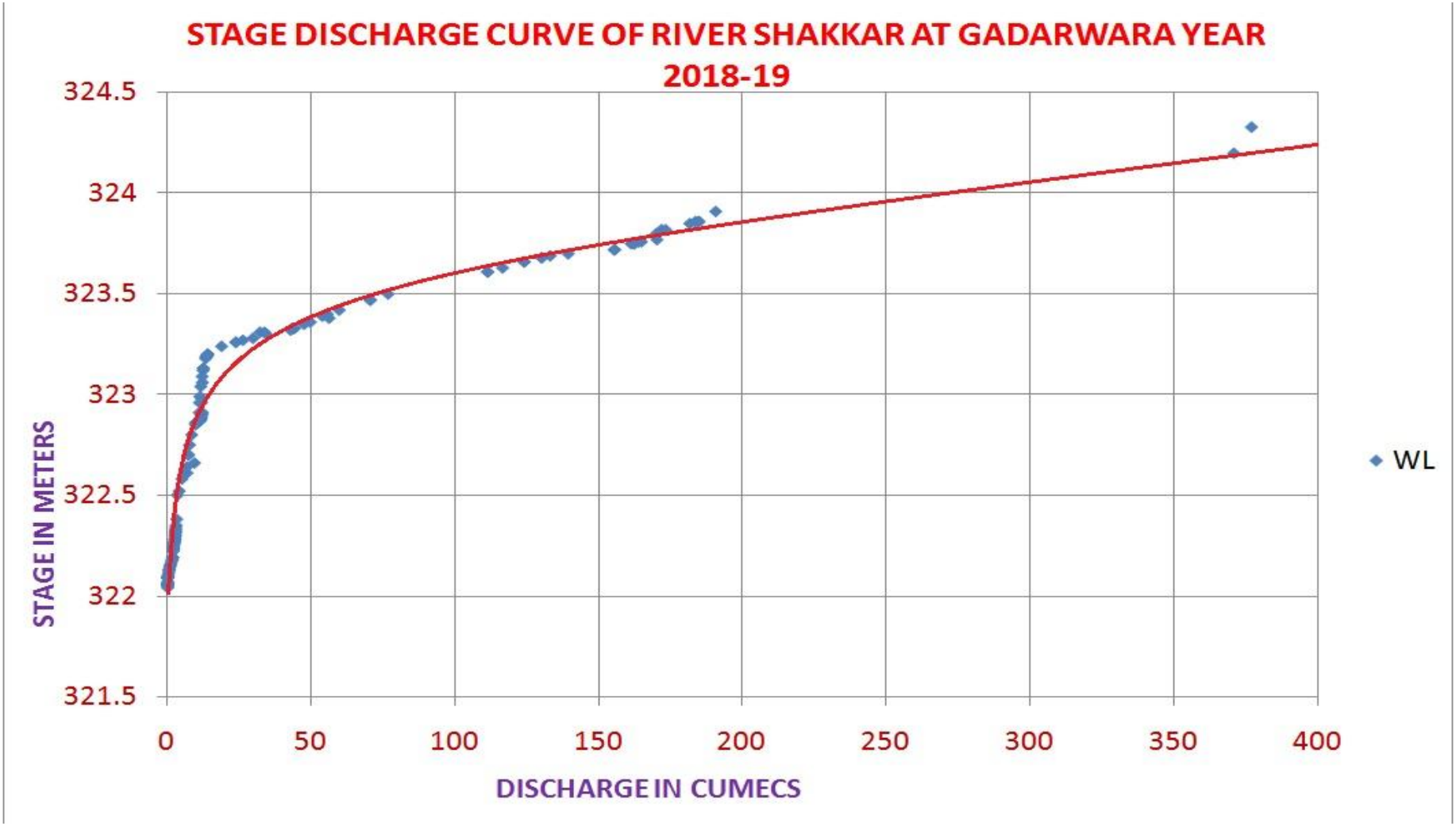
Station Name : Shakkar at Gadarwara (010215012)

Division : Narmada Division, Bhopal

Local River : Shakkar

Sub-Division : MNSD I, CWC Hoshangabad




STAGE DISCHARGE CURVE OF RIVER SHAKKAR AT GADARWARA YEAR 2018-19
STAGE IN METERS
324.5
324
323.5
323
322.5
322
321.5
0
50
100
150
200
250
300
350
400
DISCHARGE IN CUMECS
WL

4.10 Narmada at Barmanghat

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2017 - 2018
Site	:	Barmanghat	**Code**	:	012-NDBHP
State	:	Madhya Pradesh	**District**	:	Hoshangabad
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	26453.0 Sq. Km.	**Bank**	:	Right
Latitude	:	23°1'51''	**Longitude**	:	79°0'55''
Current Zero of Gauge (m)	:	306			

CATEGORY		Opening Date	Closing Date
Gauge	:	09/12/1970	
Discharge	:	20/11/1971	
Sediment	:	27/08/1972	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
306.0	01/12/2013	-
0.0	31/05/2014	31/05/2015
306.0	01/03/2017	-
306.0	01/01/2015	-
306.0	01/06/2013	31/12/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1970-1971	0	309.75	25/05/1971	0	309.75	25/05/1971
1971-1972	199.2	310.005	20/11/1971	10.7	308.28	28/05/1972
1972-1973	16193.5	330.185	31/08/1972	8.7	308.125	19/06/1972
1973-1974	20658.2	330.455	30/08/1973	8	307.62	10/06/1973
1974-1975	17288.2	329.25	19/08/1974	6.1	307.56	31/05/1975
1975-1976	15847.8	328.205	23/08/1975	5.4	307.558	16/06/1975
1976-1977	3074.3	315.44	16/08/1976	5.9	307.47	17/05/1977
1977-1978	13455.2	326.838	08/08/1977	5.7	307.46	03/06/1977
1978-1979	6961.5	311.248	30/07/1978	10	307.64	09/06/1978
1979-1980	8158.1	322.175	10/08/1979	4.6	307.37	30/05/1980
1980-1981	12375	326.725	30/08/1980	4.5	307.37	01/06/1980
1981-1982	2904	315.155	29/07/1981	4	307.445	18/05/1982
1982-1983	4641.6	317.702	18/08/1982	5.5	307.425	02/06/1982
1983-1984	14890.5	325.625	09/09/1983	2.9	307.565	31/05/1984
1984-1985	12220	327.6	19/08/1984	3	307.565	04/06/1984
1985-1986	6860	321.4	09/08/1985	7.8	307.555	07/06/1985
1986-1987	3170	317.36	23/07/1986	1.2	307.52	01/06/1986
1987-1988	10800	323.715	18/09/1987	4.54	307.465	05/06/1987
1988-1989	11200	324.03	05/08/1988	3.4	307.5	27/04/1989
1989-1990	2750	315.67	06/08/1989	5.23	307.47	03/06/1989
1990-1991	7200	320.42	20/09/1990	22.38	307.57	02/06/1990
1991-1992	19500	329.24	24/08/1991	27	307.75	17/01/1992
1992-1993	9400	323.45	12/09/1992	18.68	307.81	05/03/1993
1993-1994	7100	319.63	28/09/1993	20	307.7	08/06/1993
1994-1995	15600	327.22	21/07/1994	51	308.31	04/06/1994
1995-1996	10000	323.59	11/08/1995	46	307.92	12/11/1995
1996-1997	1750	313.17	21/08/1996	19	307.5	04/06/1996
1997-1998	5700	319.08	03/08/1997	56.63	307.9	26/06/1997
1998-1999	3900	316.15	15/09/1998	21.44	307.58	24/05/1999
1999-2000	21500	329.26	19/09/1999	19.8	307.6	06/06/1999
2000-2001	5900	318.97	28/07/2000	30.87	307.7	23/05/2001
2001-2002	6950	320.16	15/07/2001	31	307.71	31/03/2002
2002-2003	9800	323.5	18/08/2002	25.15	307.38	22/03/2003
2003-2004	6800	320.17	05/09/2003	65.14	307.93	12/05/2004
2004-2005	12300	323.8	23/08/2004	30	307.62	11/06/2004
2005-2006	10452.2	323.555	16/09/2005	18.69	307.55	25/06/2005

2006-2007	4752.72	318.38	31/08/2006	24.27	307.56	23/06/2006
2007-2008	818.66	311.48	09/07/2007	30.89	307.6	05/05/2008
2008-2009	4051.12	316.935	02/08/2008	36.02	307.7	15/01/2009
2009-2010	7727.63	321.3	09/09/2009	25.54	307.59	30/06/2009
2010-2011	2535.61	314.93	20/09/2010	37.46	307.55	20/04/2011
2011-2012	8131.4	322	09/09/2011	36.82	307.5	26/05/2012
2012-2013	4040.76	317.75	13/08/2012	29.4	307.61	08/06/2012
2013-2014	1	0	17/03/2014	1	0	17/03/2014
2014-2015	236	309.15	19/03/2015	70.7	307.8	30/04/2015
2015-2016	1881.21	313.94	05/08/2015	24.8	307.38	13/04/2016
2016-2017	6091	319.12	08/08/2016	31.9	307.64	02/06/2016
2017-2018	1017	312.13	22/07/2017	17	307.35	18/02/2018

Stage Discharge Sheet for Narmada at Barmanghat for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	84.3	308.01	125	308.56	750	309.75	3100	315.8
2	93.1	308.22	114.7	308.62	290	309.62	1680	313.6
3	100	308.2	106	308.4	285	309.58	1390	313.06
4	62.3	307.9	112	308.35	295	309.73	1140	312.45
5	41.2	307.78	111	308.38	260	309.54	980	312.09
6	74.2	308	113	308.38	250	309.3	1110	312.37
7	72.1	307.98	125	308.37	233	309.27	1180	312.55
8	64.1	307.99	120	308.36	320	309.8	1360	312.95
9	63.3	307.86	171	308.95	1740	313.74	4350	317.5
10	62	307.91	153	308.85	900	311.88	2320	314.65
11	78.9	308.16	131	308.57	600	310.9	980	312.04
12	82.8	307.97	128	308.49	490	310.54	880	311.78
13	68.9	307.91	380	310.02	420	310.3	760	311.4
14	81.7	308.04	233	309.27	430	310.33	380	310.1
15	95.2	308.23	162	308.9	390	310.16	360	310.05
16	84	308.11	171	309	860	311.7	340	309.93
17	80	308.08	506	310.6	1110	312.37	320	309.83
18	83.7	308.04	390	310.12	1080	312.27	310	309.76
19	86	308.16	820	311.56	940	311.87	300	309.69
20	95.4	308.26	560	310.85	1060	312.25	290	309.63
21	90.2	308.22	280	309.56	1900	313.99	275	309.58
22	84.6	308.06	242	309.18	2250	314.49	280	309.6
23	119	308.36	201	309.91	1980	314.09	305	309.71
24	85	308.12	1900	313.96	1580	313.42	350	309.97
25	74.2	307.94	1670	313.6	1040	312.45	320	309.8
26	80.2	308.06	1250	312.74	620	310	300	309.69
27	88.6	308.14	970	312.01	530	310.7	280	309.6
28	85.3	308.14	900	311.83	580	310.85	255	309.54
29	80.9	308.12	700	311.2	3420	316.25	250	309.51
30	122	308.61	560	310.75	2820	315.4		
31			330	310.01	4280	317.4		
Ten-Daily Mean								
I Ten-Daily	71.66	307.99	125.07	308.52	532.3	310.22	1861	313.7
II Ten-Daily	83.66	308.1	348.1	309.74	738	311.27	492	310.42
III Ten-Daily	91	308.18	818.45	311.34	1909.09	313.55	261.5	278.7
Monthly								
Min.	41.2	307.78	106	308.35	233	309.27	250	309.51
Max.	122	308.61	1900	313.96	4280	317.4	4350	317.5
Mean	82.11	308.09	430.54	309.87	1059.8	311.68	871.5	300.94

Annual Runoff in MCM : 8223.05 **Annual Runoff in mm : 310.86**

Peak Observed Discharge = 289 cumecs on 1/10/2018 Corres. Water Level 309.42 m

Lowest Observed Discharge = 23.3cumecs on 27/3/2019 Corres. Water Level 307.43 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Barmanghat for the period 2018-19

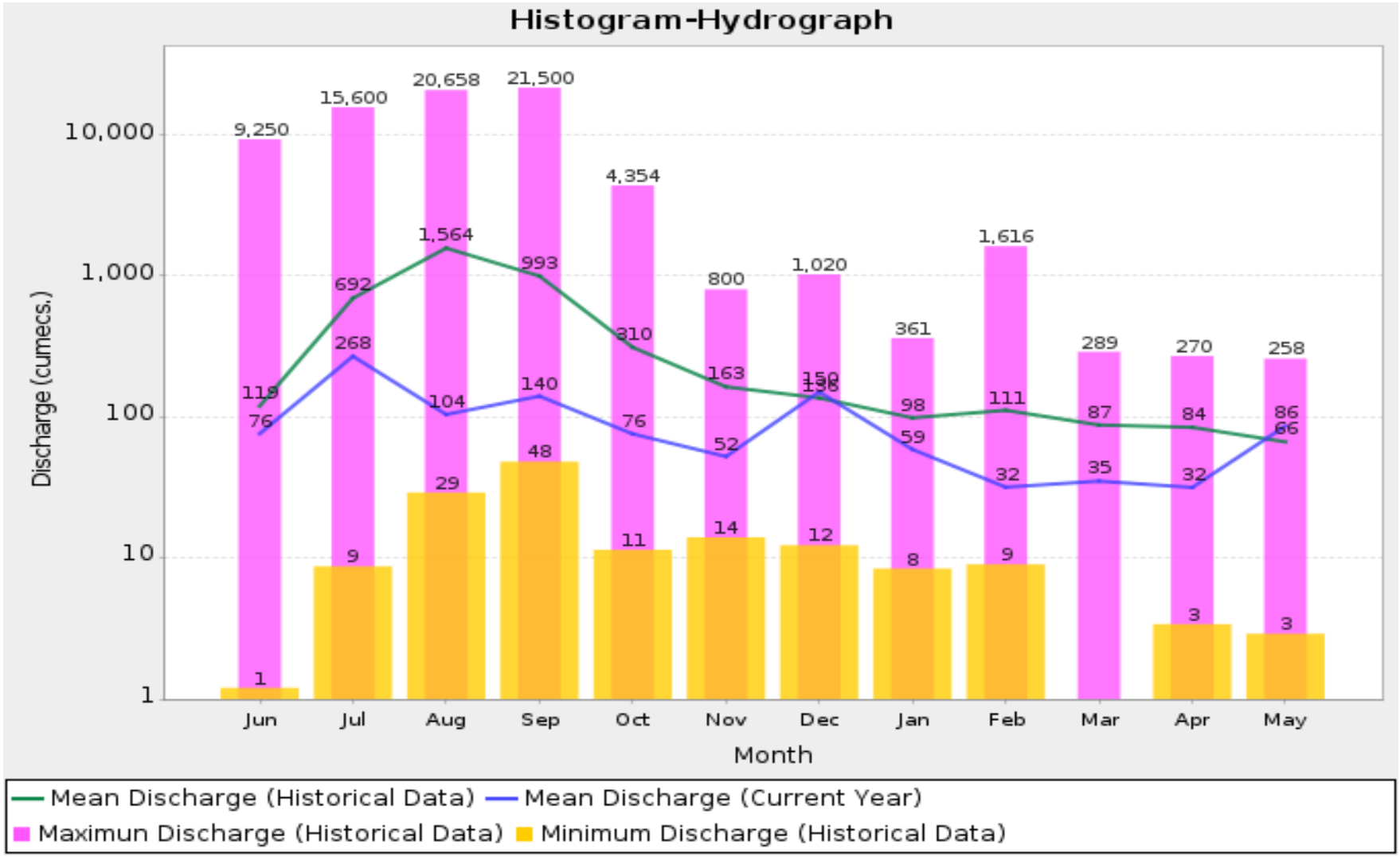
Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	289	309.42	63.3	307.87	58.9	307.74	111	308.3
2	230	309.4	51	307.82	48	307.73	124	308.4
3	237	309.22	93.5	308.21	120	308.36	135	308.51
4	218	309.1	131	308.58	116	308.38	127	308.38
5	171	308.97	134	308.4	110	308.37	109	308.23
6	140	308.53	105	308.32	105	308.26	91	308.1
7	120	308.38	74	308	101	308.16	68.9	308.9
8	201	308.9	59.5	307.9	114	308.28	68.5	308.82
9	188	308.82	91.9	308.1	100	308.21	72.6	308.96
10	195	308.84	69.5	307.86	95.9	308.12	97.6	308.08
11	190	308.83	63	307.8	77.7	307.94	99.8	308.14
12	225	309.06	65.4	307.82	69.5	307.86	94.9	308.1
13	164	308.68	68.5	307.85	71.3	307.95	80	308.06
14	150	308.7	68.7	307.88	67.7	307.9	79.5	308
15	160	308.66	65.1	307.84	57.6	307.81	86.5	308.04
16	105	308.32	64.4	307.81	52	307.79	86	308.02
17	156	308.64	59	307.79	48.5	307.72	86.3	308.11
18	173	308.75	60	307.78	48.1	307.7	86.8	308.98
19	150	308.62	58.9	307.7	102	308.18	86	308
20	131	308.58	46.4	307.65	106	308.2	95	308.1
21	151	308.72	48	307.6	108	308.24	79.8	308.04
22	163	308.61	57.8	307.73	105	308.17	79.8	308.04
23	168	308.73	66	307.9	94	308.16	83	308.03
24	176	308.76	108	308.32	113	308.3	71.7	308.98
25	186	308.87	111	308.3	119	308.28	76.1	308.92
26	165	308.62	91.2	308.1	103	308.22	72	308.96
27	167	308.65	72.1	307.96	140	308.48	60	308.87
28	130	308.55	62	307.85	150	308.54	95.1	308.1
29	109	308.27	64.3	307.8	119	308.32	71.8	308.86
30	93.5	308.2	58.8	307.76	100	308.2	74.2	308.89
31	66.9	307.99			137	308.47	61.5	308.78
Ten-Daily Mean								
I Ten-Daily	198.9	308.96	87.27	308.11	96.88	308.16	100.46	308.47
II Ten-Daily	160.4	308.68	61.94	307.79	70.04	307.91	88.08	308.16
III Ten-Daily	143.22	308.54	73.92	307.93	117.09	308.31	75	308.59
Monthly								
Min.	66.9	307.99	46.4	307.6	48	307.7	60	308
Max.	289	309.42	134	308.58	150	308.54	135	308.98
Mean	167.51	308.73	74.38	307.94	94.67	308.12	87.85	308.4

Peak Computed Discharge = 4350 cumecs on 9/9/2018 Corres. Water Level 317.5 m
Lowest Computed Discharge = 25cumecs on 26/5/2019 Corres. Water Level 613.48 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve *Note:Missing values ignored while arriving at Annual Runoff*

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	44.7	307.66	41	307.61	33.8	307.58	40.3	613.54
2	47.1	307.73	57.4	307.65	35.5	307.55	48.2	673.61
3	63	307.8	52	307.69	121	308.34	47	613.58
4	69.5	307.86	48	307.6	112	308.34	44.7	613.55
5	74.1	307.89	71	307.87	126	308.36	44	613.55
6	65.1	307.84	47	307.69	114	308.32	35	613.54
7	64.3	307.82	40.4	307.56	91	308.1	31.2	613.49
8	63.3	307.87	99.3	307.2	40.4	307.58	35	613.48
9	68.3	307.92	114	307.36	30.7	307.52	25.6	613.46
10	70	307.94	100	307.21	34.8	307.42	27.8	613.47
11	76.9	307.98	63.2	307.88	35	307.46	37.2	613.5
12	87.4	308.06	77.7	307.96	25.7	307.45	37	613.5
13	91.9	308.1	87.4	307.08	40.2	307.49	35.9	613.51
14	80.7	307.01	46.4	307.66	0.0	307.52	38	613.53
15	63.1	307.88	38	307.54	38.1	307.59	33.8	613.52
16	69.6	307.91	43.5	307.6	40.6	307.62	31.9	613.5
17	74	307.95	52	307.72	0.0	307.6	48	613.47
18	48.2	307.78	48.6	307.64	35.5	307.56	49	613.6
19	61	307.84	40.3	307.58	0.0	307.52	55.5	613.64
20	65.9	307.93	35.5	307.56	40.3	307.59	55.5	613.66
21	73.6	307.87	35	307.56	43	307.6	49.9	613.64
22	73.2	307.86	35.9	307.53	35.9	307.57	48.7	613.61
23	82.9	308.08	31.1	307.5	34.3	307.48	35.4	613.58
24	80	308.06	30	307.5	26.4	307.46	28.4	613.56
25	108	308.24	29.1	307.48	26.3	307.44	25.7	613.48
26	99.8	308.14	26.4	307.45	38	307.56	25	613.48
27	63.3	307.66	23.3	307.43	44.5	307.64	27.2	613.51
28	43.8	307.61	25.7	307.46	44	307.62	35.4	613.54
29	0.0		31.2	307.48	35.1	307.53	25.6	613.49
30			27.2	307.51	31.1	307.5	42.9	613.58
31			48	307.6			44.7	613.68
Ten-Daily Mean								
I Ten-Daily	62.94	307.83	67.01	307.54	73.92	307.91	37.88	619.53
II Ten-Daily	71.87	307.84	53.26	307.62	25.54	307.54	42.18	613.54
III Ten-Daily	78.07	307.94	31.17	307.5	35.86	307.54	35.35	613.56
Monthly								
Min.	43.8	307.01	23.3	307.08	25.7	307.42	25	613.46
Max.	108	308.24	114	307.96	126	308.36	55.5	673.61
Mean	70.96	307.87	50.48	307.56	45.11	307.66	38.47	615.54

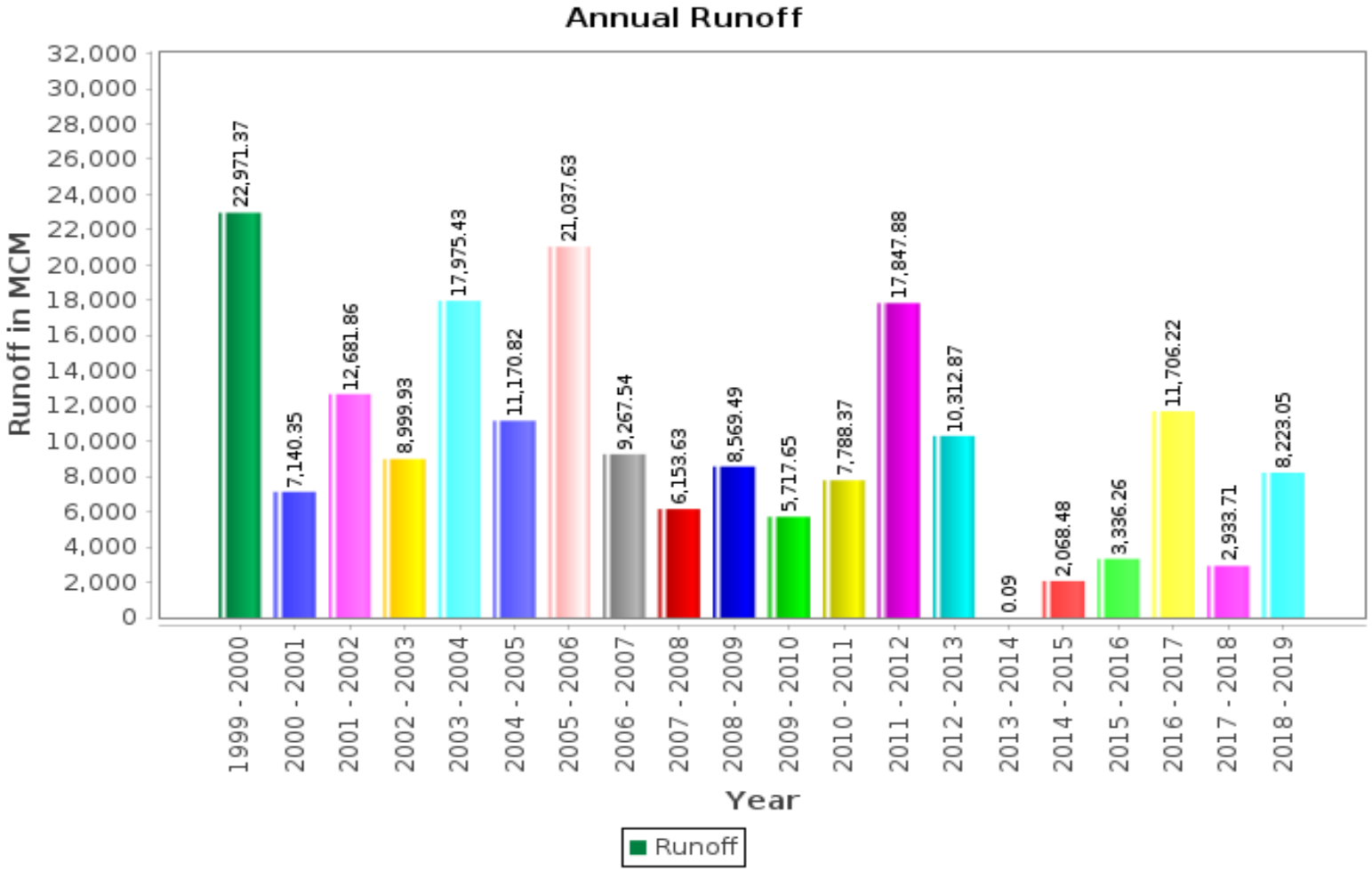
Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1972-2019)



Annual Runoff Values for the period (1972 – 2019)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad

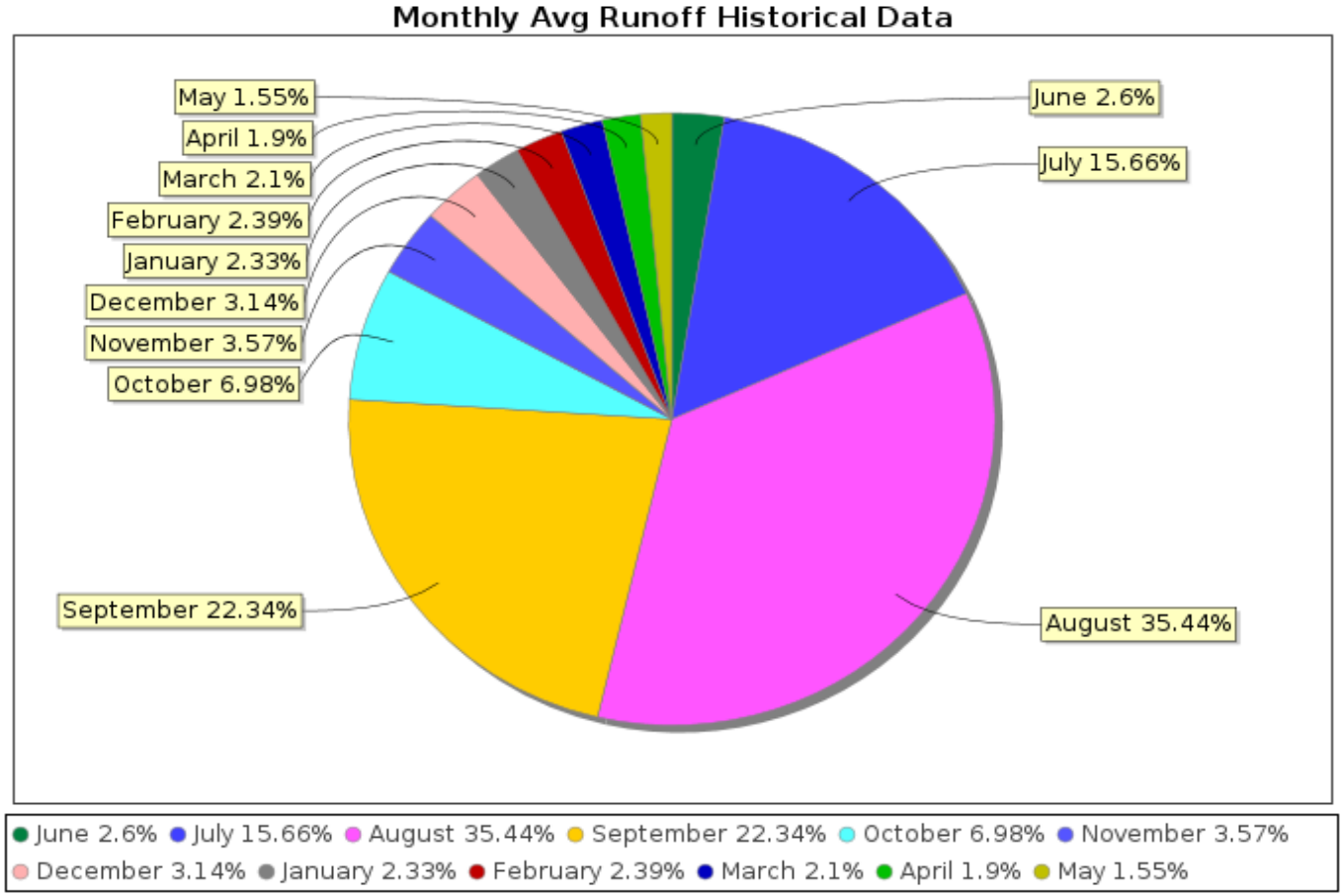


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1972 – 2019)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

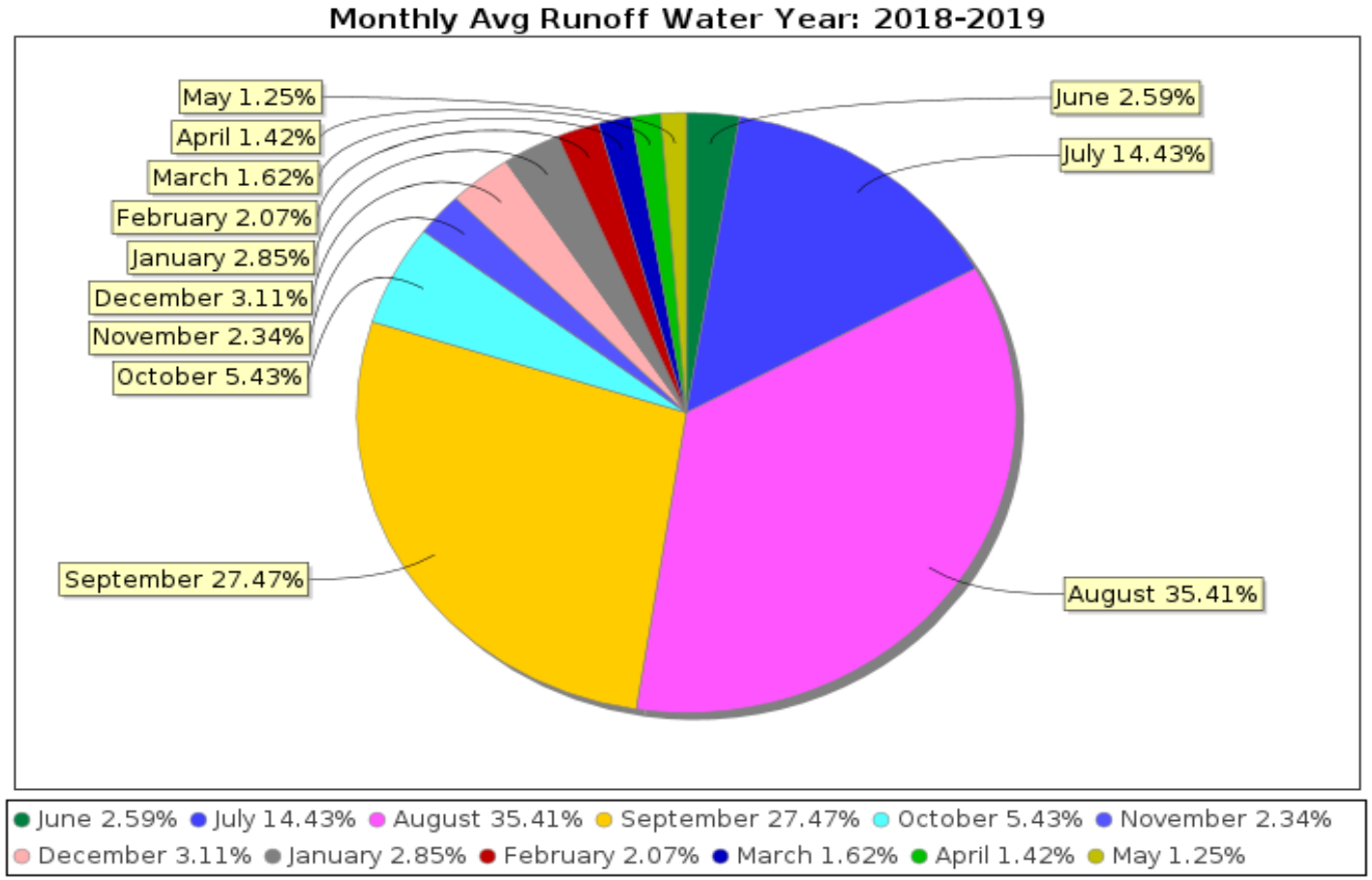
Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

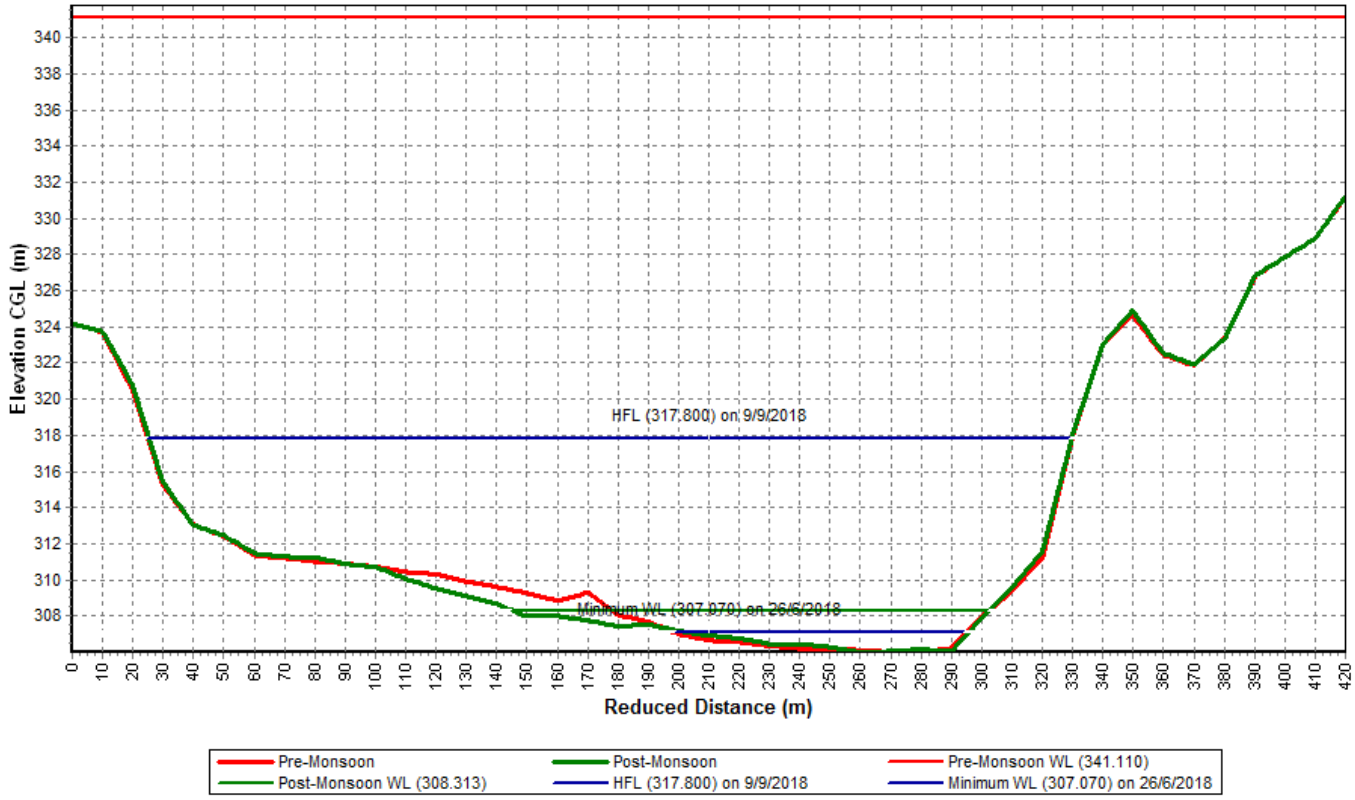
Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Barmanghat (010215011) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : MNSD I, CWC Hoshangabad



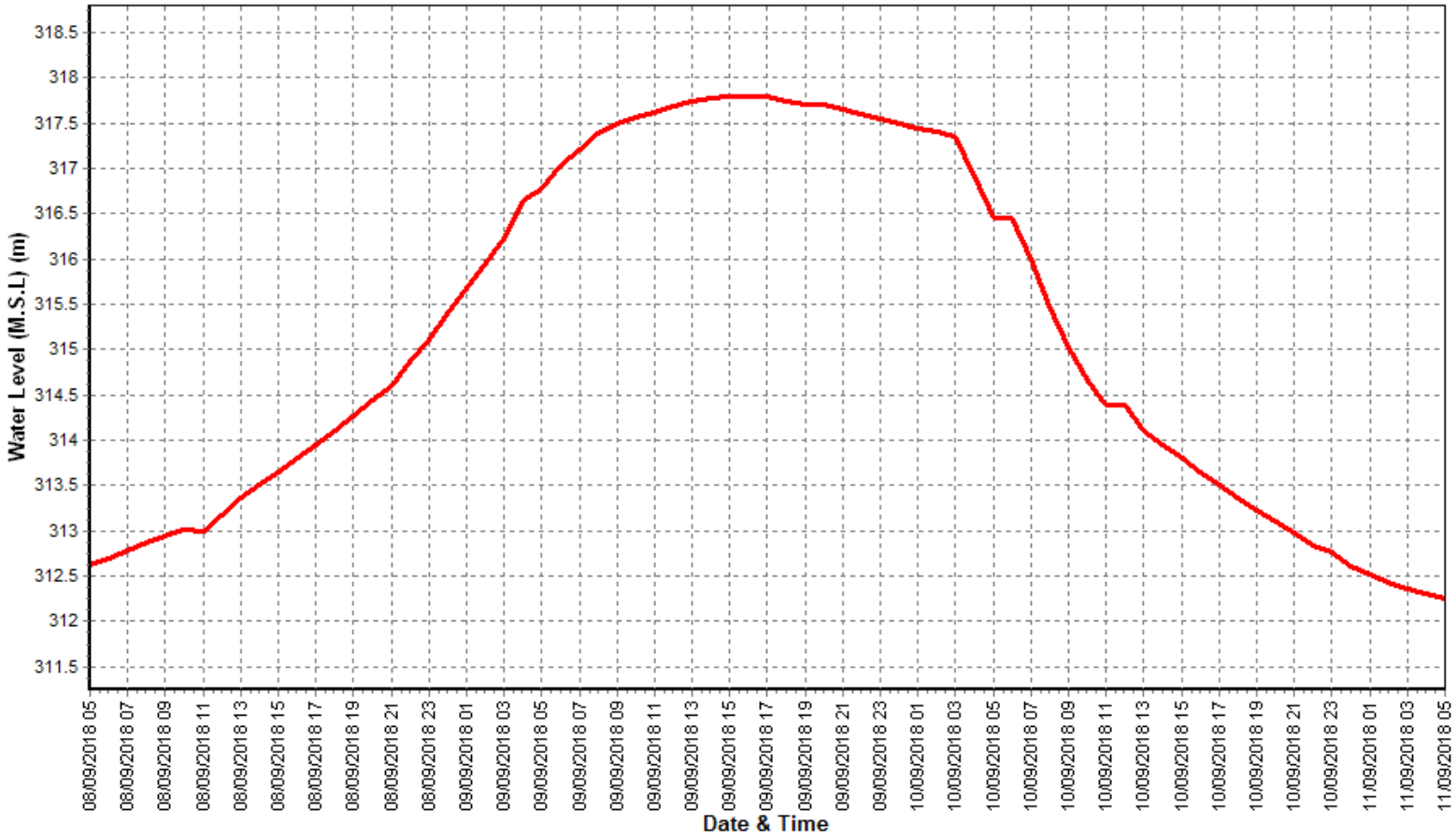
Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Barman (010215011)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



Water

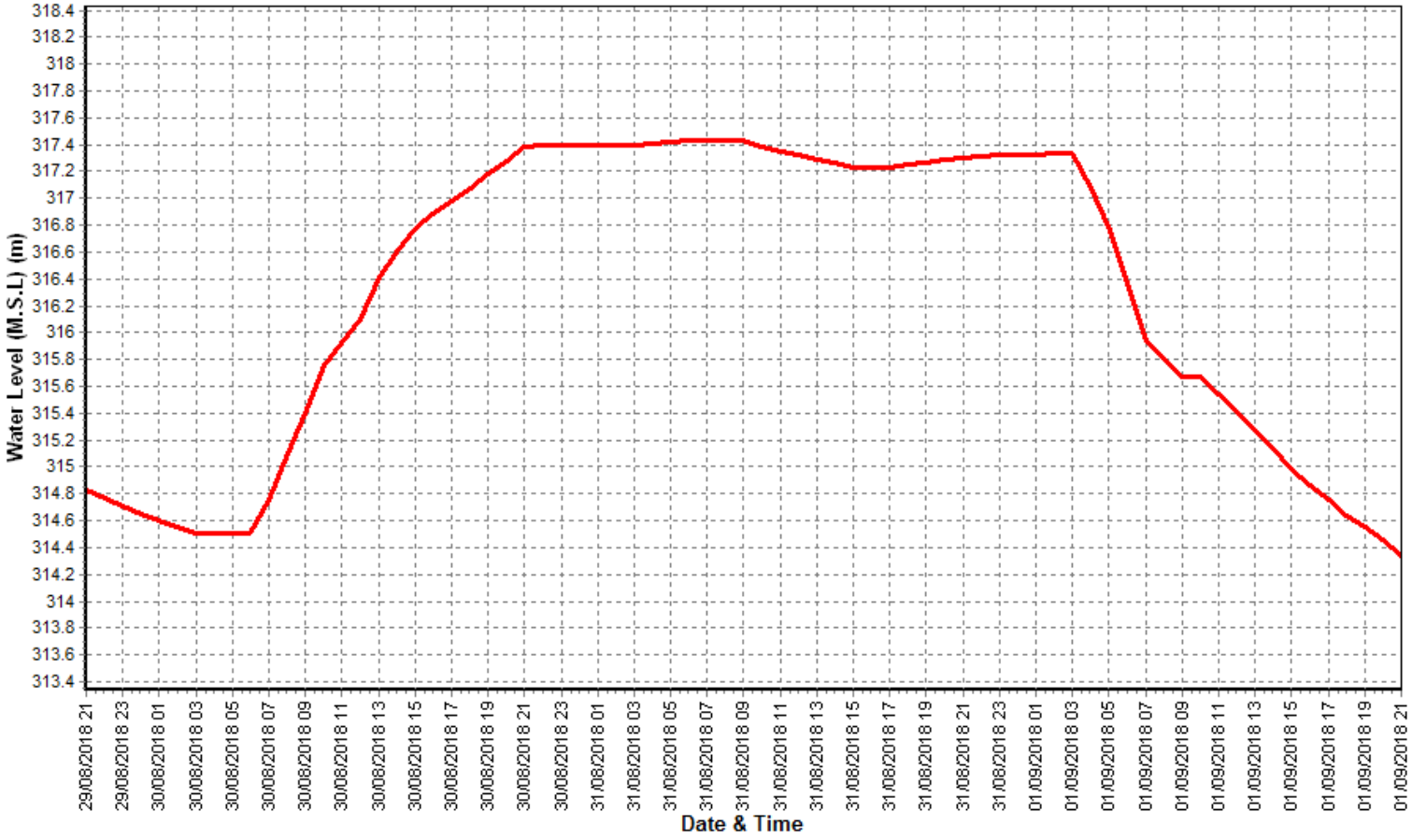
Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Barman (010215011)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad



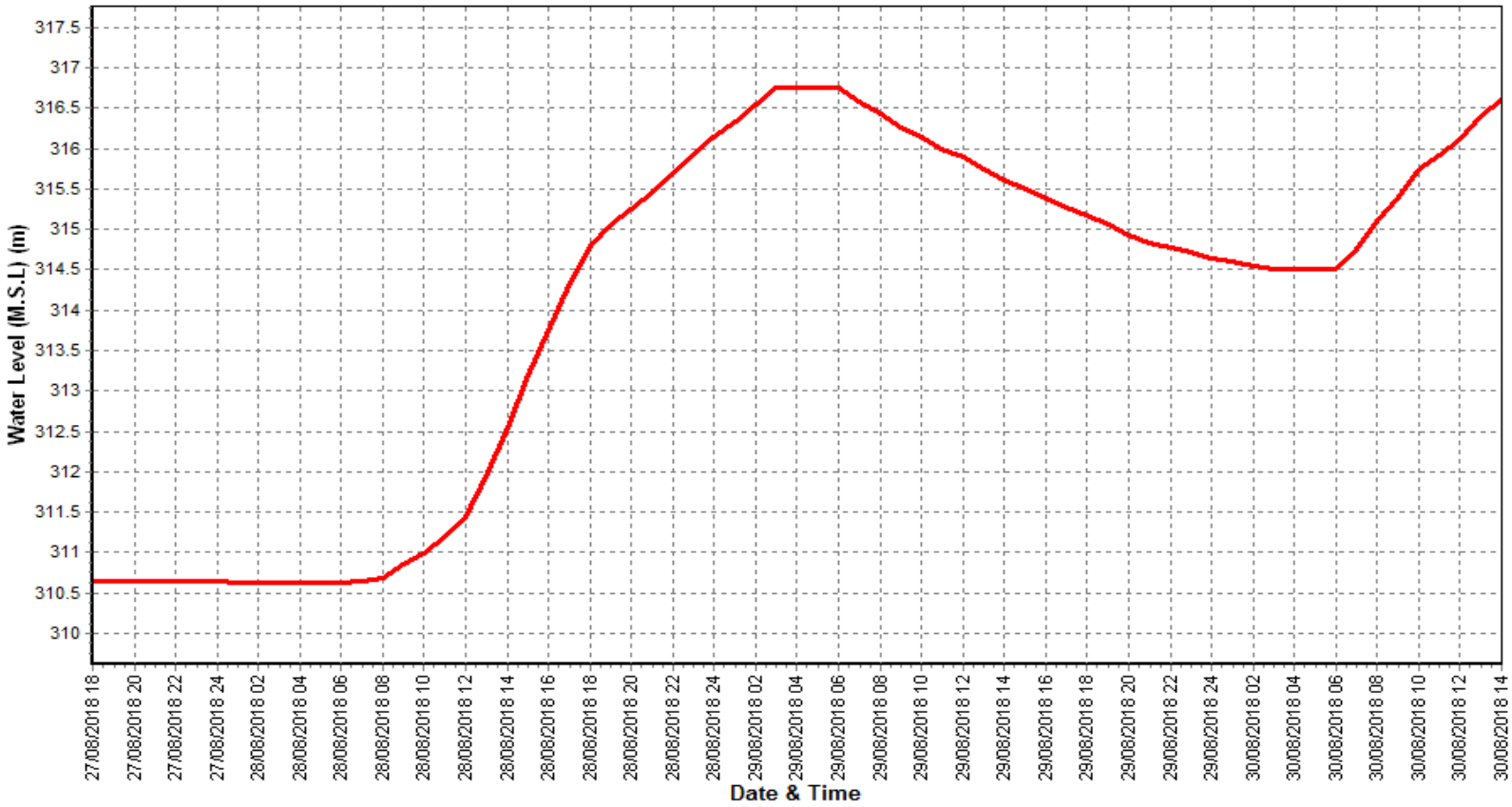
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

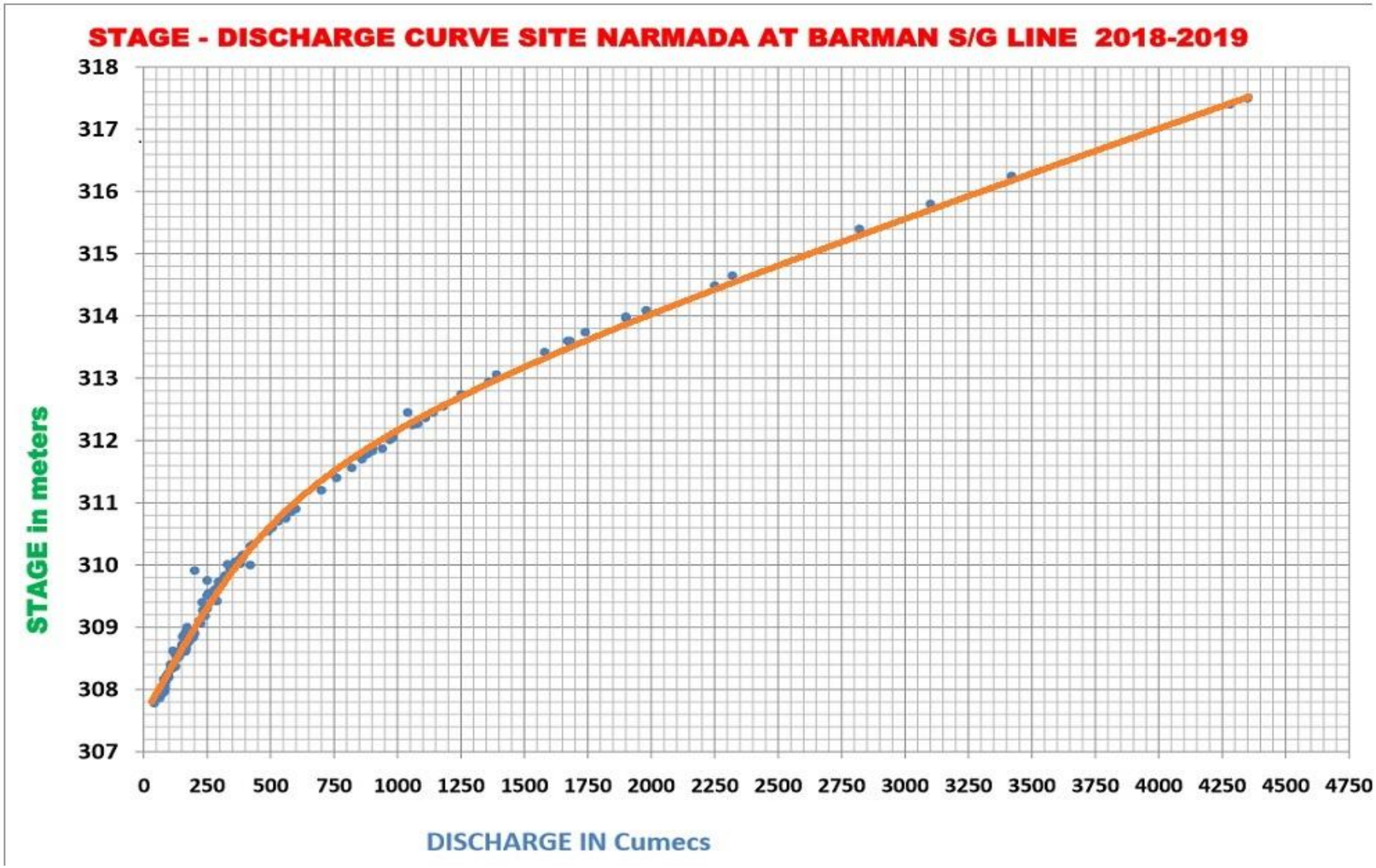
Station Name : Narmada at Barman (010215011)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : MNSD I, CWC Hoshangabad




STAGE - DISCHARGE CURVE SITE NARMADA AT BARMAN S/G LINE 2018-2019
STAGE in meters
318
317
316
315
314
313
312
311
310
309
308
307
0
250
500
750
1000
1250
1500
1750
2000
2250
2500
2750
3000
3250
3500
3750
4000
4250
4500
4750
DISCHARGE IN Cumecs

4.11 Sher at Belkheri

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Belkhedi	**Code**	:	020-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Sher	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Sher
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Middle Narmada Sub-Division-I, Hosangabad
Drainage Area	:	1508.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°55'40''	**Longitude**	:	79°20'22''
Current Zero of Gauge (m)	:	340			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/03/1977	
Discharge	:	16/03/1977	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
340.0	31/05/2014	-
340.0	16/03/1977	31/05/2013
340.0	01/02/1977	16/03/1977

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	0.7	341.3	16/03/1977	0.2	341.44	30/04/1977
1977-1978	1695	348.23	07/08/1977	0.1	341.435	08/06/1977
1978-1979	1280	346.435	15/08/1978	0.7	341.165	05/06/1978
1979-1980	2056.2	347.75	09/08/1979	0.4	341.28	15/05/1980
1980-1981	2712	349.1	29/08/1980	0.4	341.28	15/06/1980
1981-1982	645	345.15	22/09/1981	0.3	341.405	27/03/1982
1982-1983	2002.5	348.4	11/09/1982	0.3	341.565	25/04/1983
1983-1984	1700	348.2	08/09/1983	0.3	341.52	17/06/1983
1984-1985	6500	353.37	18/08/1984	0.4	341.02	05/05/1985
1985-1986	2150	348.65	17/08/1985	0.2	341.02	09/06/1985
1986-1987	1245	346.72	14/08/1986	0.02	341.01	21/06/1986
1987-1988	367	343.975	17/09/1987	0.32	341.22	29/05/1988
1988-1989	1200	347	04/08/1988	0.28	341.3	31/05/1989
1989-1990	1018	346.7	06/08/1989	0.25	341.3	03/06/1989
1990-1991	1300	347	30/08/1990	0.55	341.42	15/05/1991
1991-1992	1570	347.75	23/08/1991	0.41	341.32	20/05/1992
1992-1993	1560	347.5	20/08/1992	0.35	341.36	17/04/1993
1993-1994	2975	350.8	16/07/1993	0.26	341.09	18/05/1994
1994-1995	7600	359.95	21/07/1994	0.6	341.1	28/05/1995
1995-1996	864	345.8	20/07/1995	0.33	340.95	15/05/1996
1996-1997	323	343.8	29/08/1996	0.25	341.08	25/05/1997
1997-1998	2300	348.56	24/07/1997	0.25	341.085	09/06/1997
1998-1999	530	344.92	05/07/1998	0.12	341.08	13/04/1999
1999-2000	4475	353.94	15/09/1999	0.17	341.04	01/07/1999
2000-2001	1650	347.29	28/07/2000	0.31	340.94	10/04/2001
2001-2002	3900	352.92	19/07/2001	0.33	341	14/05/2002
2002-2003	2300	350.4	18/08/2002	0.24	340.91	27/04/2003
2003-2004	3700	352.78	14/09/2003	0	340.87	28/11/2003
2004-2005	1330	348.85	22/08/2004	0.18	340.96	04/06/2004
2005-2006	590.28	344.98	15/09/2005	0.11	341	12/06/2005
2006-2007	4803.16	351.2	22/07/2006	0.09	341.02	25/06/2006
2007-2008	1076.94	345.3	08/07/2007	0.1	341.05	10/06/2007
2008-2009	232.92	343.48	01/08/2008	0.13	341.05	03/06/2008
2009-2010	454.37	344.45	09/09/2009	0.05	340.94	30/05/2010
2010-2011	411.7	344.05	19/09/2010	0.11	340.94	06/06/2010
2011-2012	431.08	344.36	16/07/2011	0.04	340.89	12/06/2011
2012-2013	1224.06	346.15	06/08/2012	0.08	341.02	13/06/2012

2013-2014	702.87	345.1	22/08/2013	0.34	341.05	03/06/2013
2014-2015	415.62	344.4	06/08/2014	0.34	341.38	12/05/2015
2015-2016	451.45	344.41	04/08/2015	0.24	341.04	14/05/2016
2016-2017	425	344.475	12/07/2016	0.02	341.1	02/12/2016
2017-2018	239.5	343.17	24/07/2017	0	341.1	19/02/2018
2018-2019	4350	342.48	09/09/2018	0	0	18/02/2019

Stage Discharge Sheet for Sher at Belkheri for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1		341.13	0.0	341.42	7	341.42	3100	342.32
2		341.13	0.0	341.39	6.9	341.39	1680	342.24
3		341.13	0.0	341.38	5.8	341.38	1390	341.94
4		341.13	0.0	341.36	5.8	341.36	1140	341.86
5		341.13	0.0	341.36	5.37	341.36	980	342.06
6		341.12	0.0	341.35	4.5	341.35	1110	342.47
7		341.12	0.0	341.33	5.18	341.33	1180	342.59
8		341.12	0.0	341.41	4.13	341.41	1360	342.79
9		341.12	0.0	342.56	105.6	342.56	4350	342.48
10		341.12	0.0	342.18	110	342.18	2320	342.2
11		341.12	0.0	341.75	46.79	342.12	39.68	342.02
12		341.13	0.0	341.87	40	342	32.24	341.9
13		341.13	0.0	341.55	17.22	341.77	25.1	341.82
14		341.13	0.0	341.55	15.9	341.67	18.6	341.74
15		341.13	0.0	341.51	11	341.61	16.12	341.68
16		341.13	0.0	341.73	9.68	341.54	14	341.64
17		341.13	0.0	343.1	21.34	341.81	7.01	341.58
18		341.13	0.0	342.33	16.21	341.65	6.69	341.54
19		341.13	0.0	341.32	10.5	341.59	6.05	341.51
20		341.13	0.0	341.37	5.82	341.57	5.82	341.5
21		341.13	0.0	341.38	117.7	342.78	5.8	341.48
22		341.13	0.0	341.35	80	342.32	47.25	342.11
23		341.13	0.0	341.51	31.82	341.95	51.5	342.15
24		341.13	0.0	341.9	29.42	341.84	89.24	342.28
25		341.12	23.46	341.92	18.14	341.77	42.34	342.05
26		341.12	18.64	341.75	16.5	341.69	30.59	341.81
27		341.12	46.91	342.07	16.21	341.65	15.61	341.64
28		341.12	39.01	341.97	120.09	342.7	7.07	341.57
29		341.4	24.14	341.8	95.09	342.38	6.41	341.52
30		341.42	14.71	341.54	52.04	342.14	6.5	341.5
31			7.78	341.45	32.23	341.91		
Ten-Daily Mean								
I Ten-Daily	0	341.12	0	341.57	26.03	341.57	1861	342.29
II Ten-Daily	0	341.13	0	341.81	19.45	341.73	17.13	341.69
III Ten-Daily	0	341.18	15.88	341.69	55.39	342.1	30.23	341.81
Monthly								
Min.	0	341.12	7.78	341.32	4.13	341.33	5.8	341.48
Max.	0	341.42	46.91	343.1	120.09	342.78	4350	342.79
Mean	0	341.15	5.29	341.69	33.62	341.8	636.12	341.93

Annual Runoff in MCM : 1767.87 **Annual Runoff in mm : 1172.32**

Peak Observed Discharge = 3100 cumecs on 1/9/2018 Corres. Water Level 342.32 m

Lowest Observed Discharge = 4.13cumecs on 8/8/2018 Corres. Water Level 341.41 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge

#:Discarded Discharge (values changed as per rating curve)

Stage Discharge Sheet for Sher at Belkheri for the period 2018-19

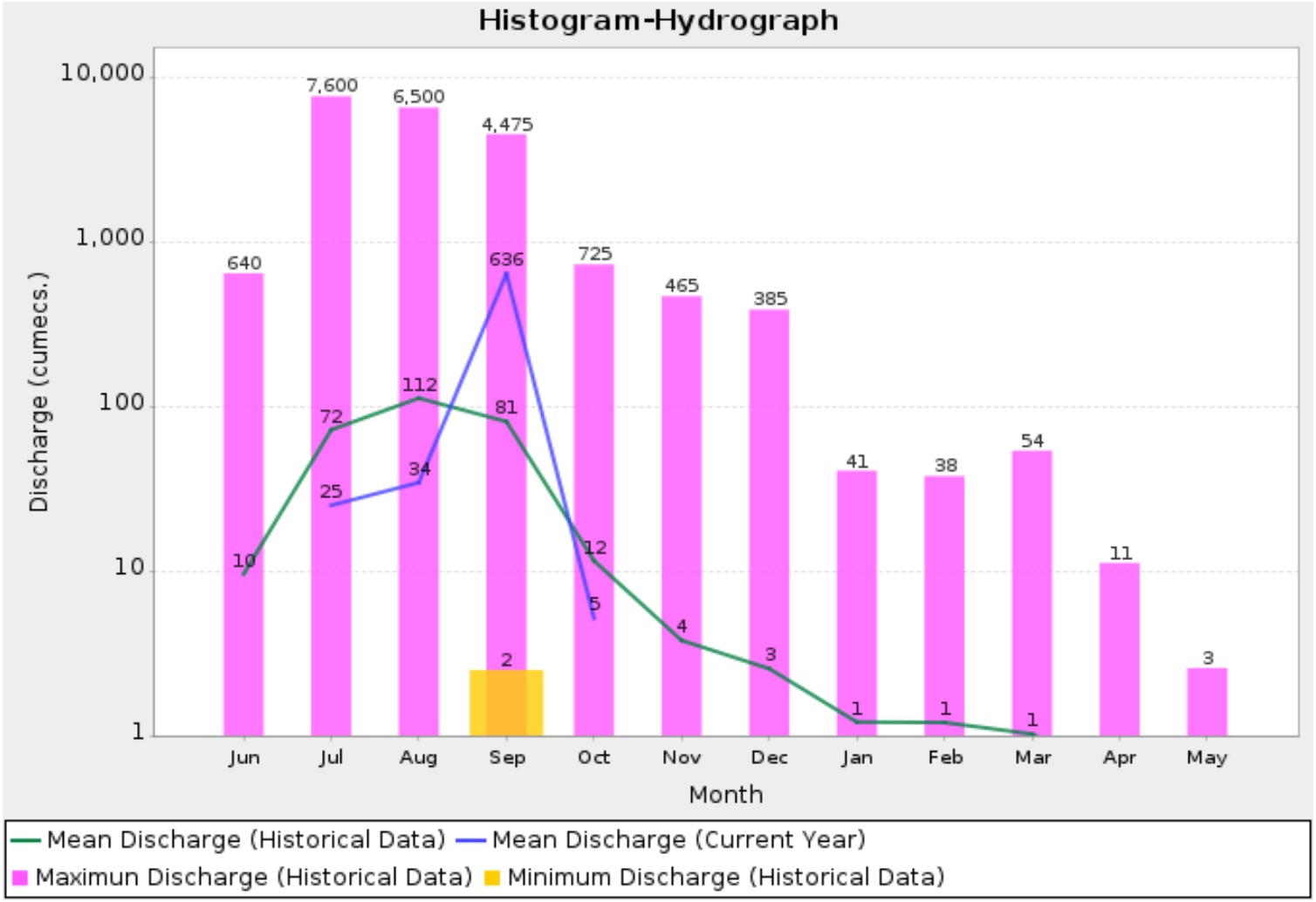
Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.17	341.48	0	0	0	0	0	0
2	6.1	341.47	0	0	0	0	0	0
3	6.48	341.45	0	0	0	0	0	0
4	6.48	341.45	0	0	0	0	0	0
5	6.1	341.44	0	0	0	0	0	0
6	5.43	341.43	0	0	0	0	0	0
7	5.4	341.42	0	0	0	0	0	0
8	5.96	341.41	0	0	0	0	0	0
9	5.67	341.40	0	0	0	0	0	0
10	5.19	341.38	0	0	0	0.00	0	0
11	5.18	341.37	0	0	0	0	0	0
12	5.11	341.36	0	0	0	0	0	0
13	5.15	341.35	0	0	0	0	0	0
14	5.6	341.34	0	0	0	0	0	0
15	5.11	341.33	0	0	0	0	0	0
16	5.02	341.32	0	0	0	0	0	0
17	4.85	341.31	0	0	0	0	0	0
18	4.86	341.3	0	0	0	0	0	0
19	4.3	341.3	0	0	0	0	0	0
20	4.77	341.29	0	0	0	0	0	0
21	4.1	341.28	0	0	0	0	0	0
22	4.35	341.27	0	0	0	0	0	0
23	4.35	341.26	0	0	0	0	0	0
24	4.42	341.26	0	0	0	0	0	0
25	4.38	341.25	0	0	0	0	0	0
26	4.31	341.25	0	0	0	0	0	0
27	4.3	341.25	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31					0	0	0	0
Ten-Daily Mean								
I Ten-Daily	5.9	341.43	0	0	0	0	0	0
II Ten-Daily	5	341.33	0	0	0	0	0	0
III Ten-Daily	2.75	217.17	0	0	0	0	0	0
Monthly								
Min.	4.1	341.25	0	0	0	0	0	0
Max.	6.48	341.48	0	0	0	0	0	0
Mean	4.55	299.98	0	0	0	0	0	0

Peak Computed Discharge = 4350 cumecs on 9/9/2018 Corres. Water Level 342.48 m
Lowest Computed Discharge = 0cumecs on 18/2/2019 Corres. Water Level 0 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
2	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
3	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
4	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
5	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
6	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
7	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
8	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
9	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
10	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
11	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
12	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
13	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
14	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
15	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.1
16	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.09
17	0.0	0.0	0.0	0.0	0.0	341.11	0.0	341.09
18	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
19	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
20	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
21	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
22	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
23	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
24	0.0	0.0	0.0	0.0	0.0	341.12	0.0	341.09
25	0.0	0.0	0.0	0.0	0.0	341.1	0.0	341.09
26	0.0	0.0	0.0	0.0	0.0	341.1	0.0	341.09
27	0.0	0.0	0.0	0.0	0.0	341.1	0.0	341.09
28	0.0	0.0	0.0	0.0	0.0		0.0	341.08
29	0.0	0.0	0.0	0.0	0.0	341.1	0.0	341.08
30						341.1		341.08
31								341.08
Ten-Daily Mean								
I Ten-Daily	0	0	0	0	0	341.11	0	341.1
II Ten-Daily	0	0	0	0	0	341.11	0	341.1
III Ten-Daily	0	0	0	0	0	307	0	341.09
Monthly								
Min.	0	0	0	0	0	341.1	0	341.08
Max.	0	0	0	0	0	341.12	0	341.1
Mean	0	0	0	0	0	329.74	0	341.09

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1977-2019)



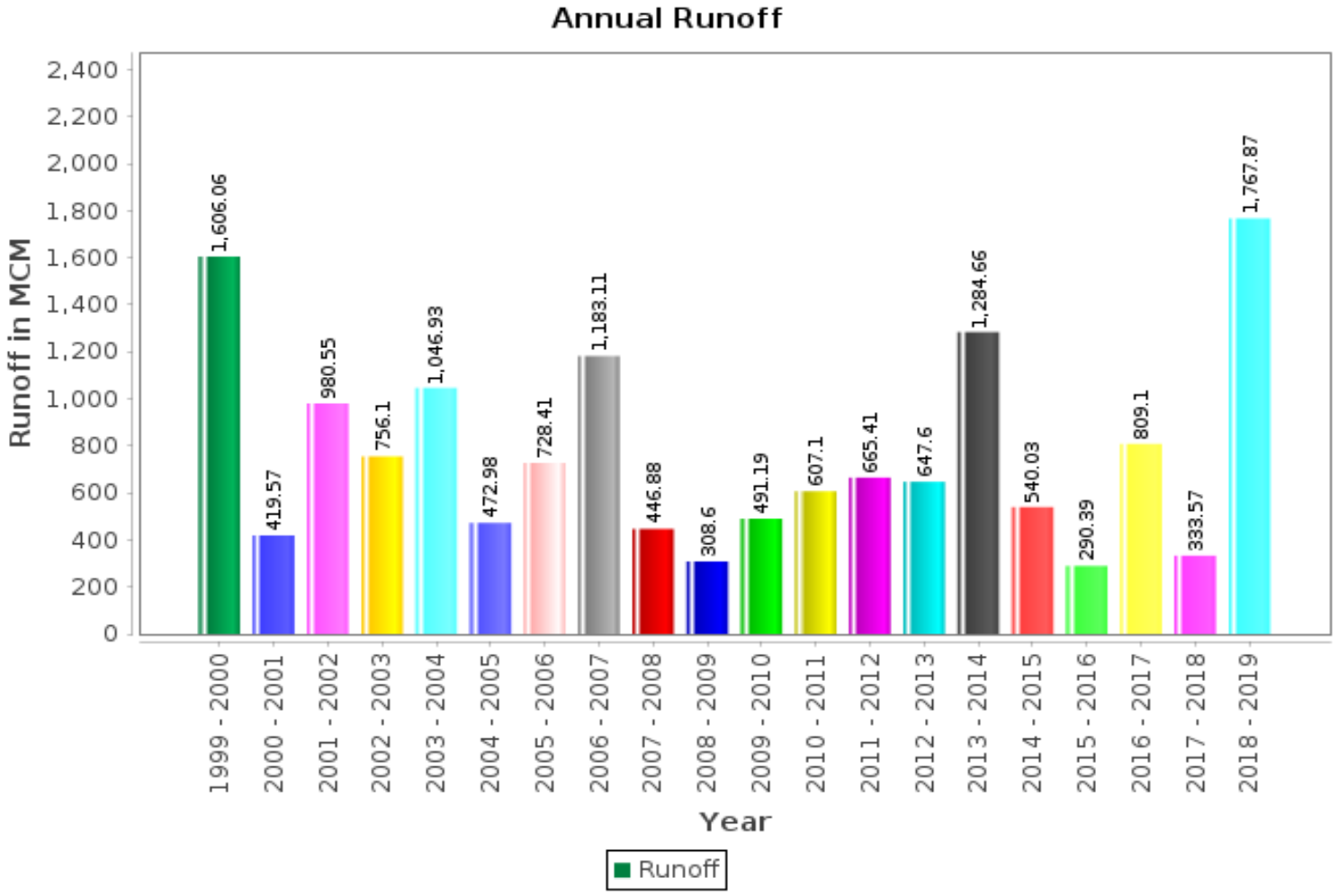
Annual Runoff Values for the period (1977 – 2019)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

Sub-Division : MNSD I, CWC Hoshangabad



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

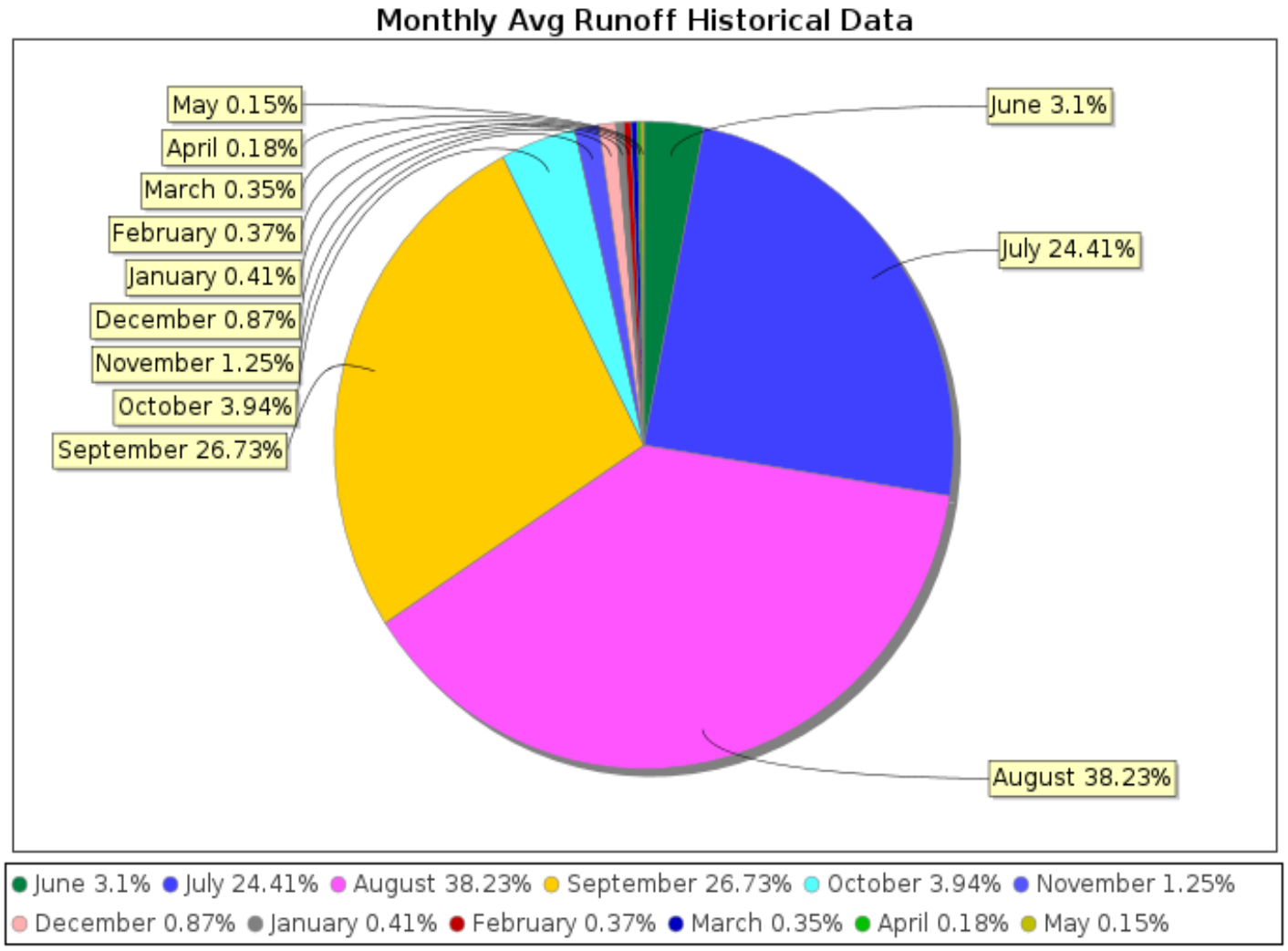
Monthly Average Runoff based on period (1977-2019)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

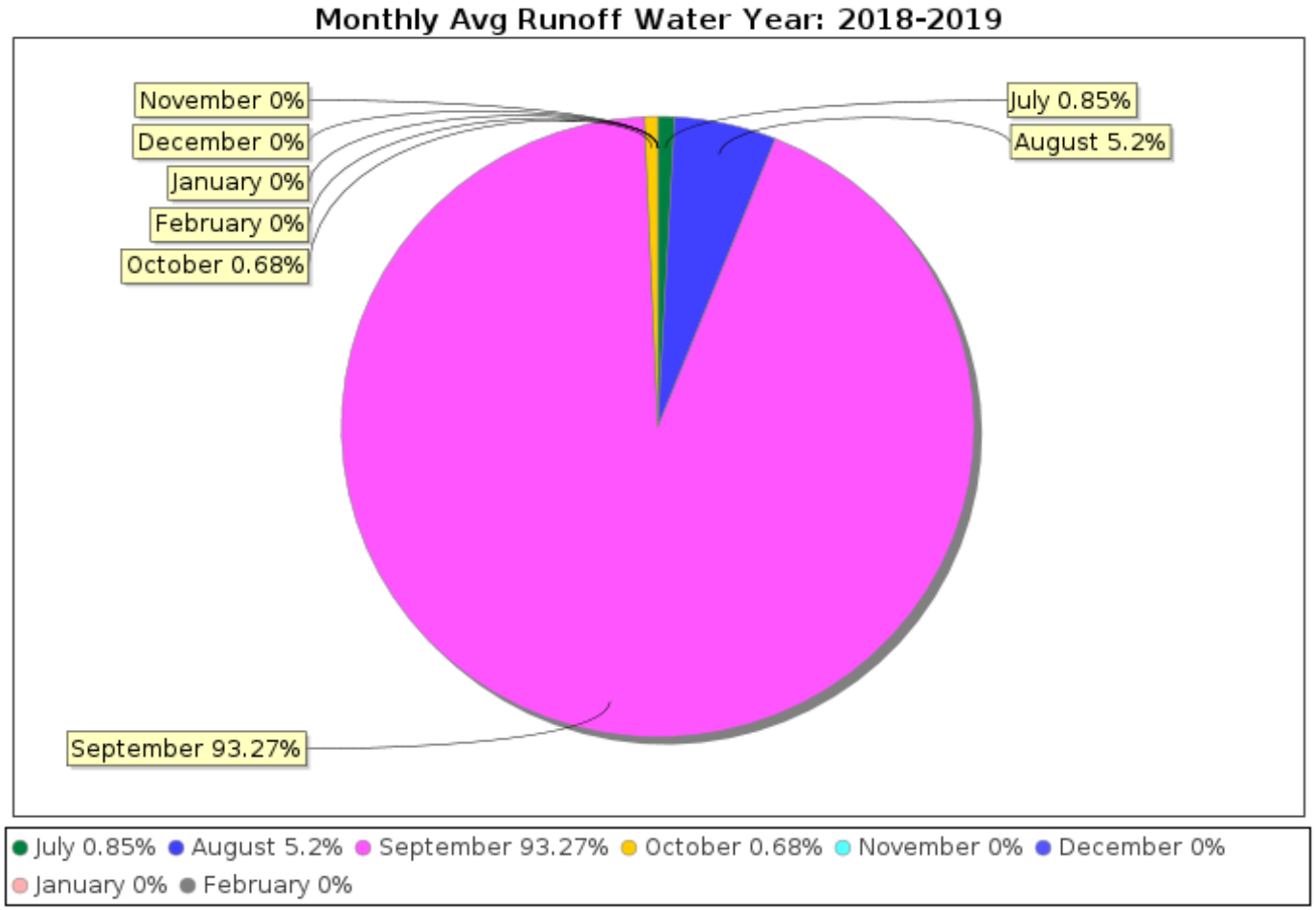
Sub-Division : MNSD I, CWC Hoshangabad



Monthly Runoff for the Year (2018-19)

Station Name : Sher at Belkheri (010215010) Division : Narmada Division, Bhopal

Local River : Sher Sub-Division : MNSD I, CWC Hoshangabad



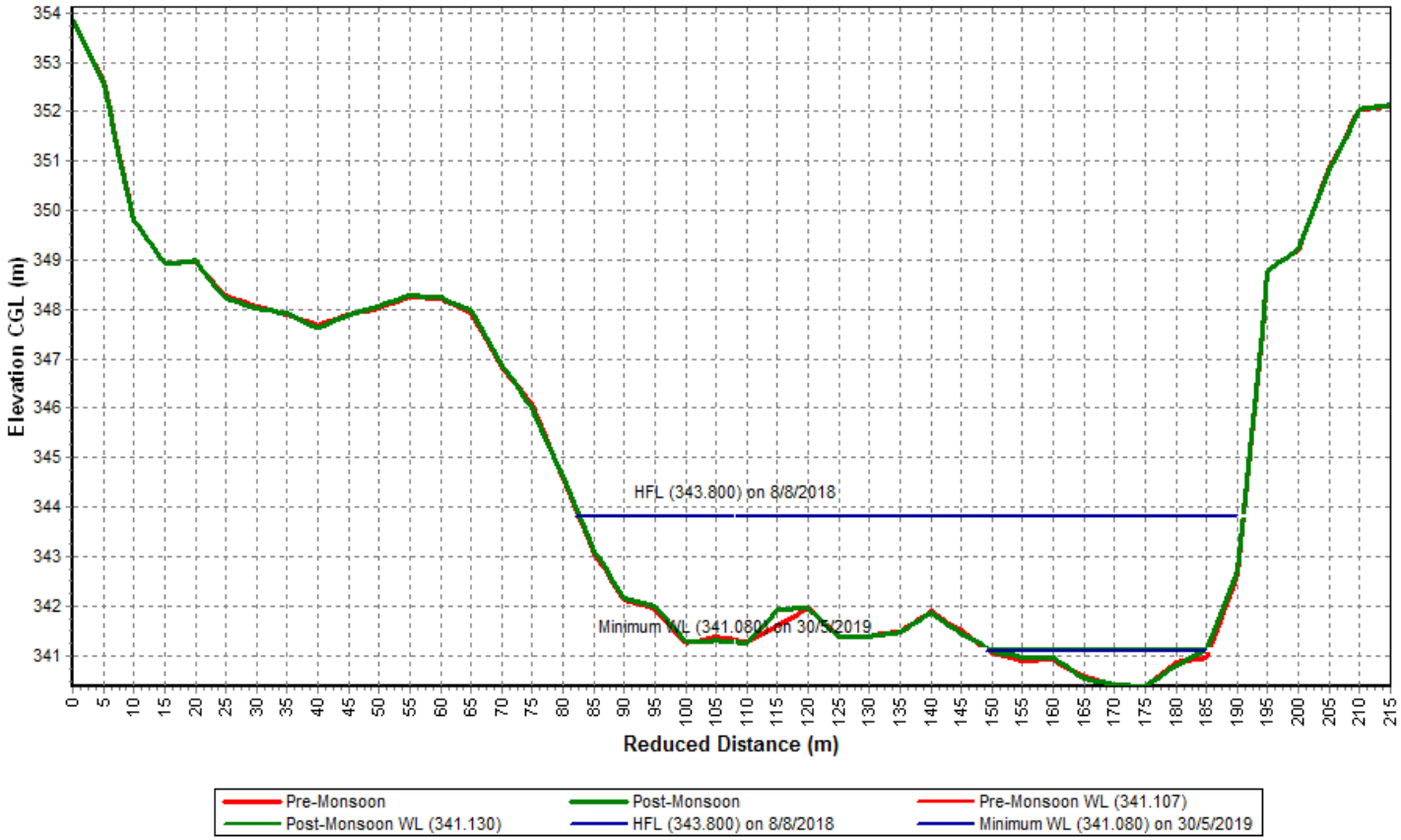
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

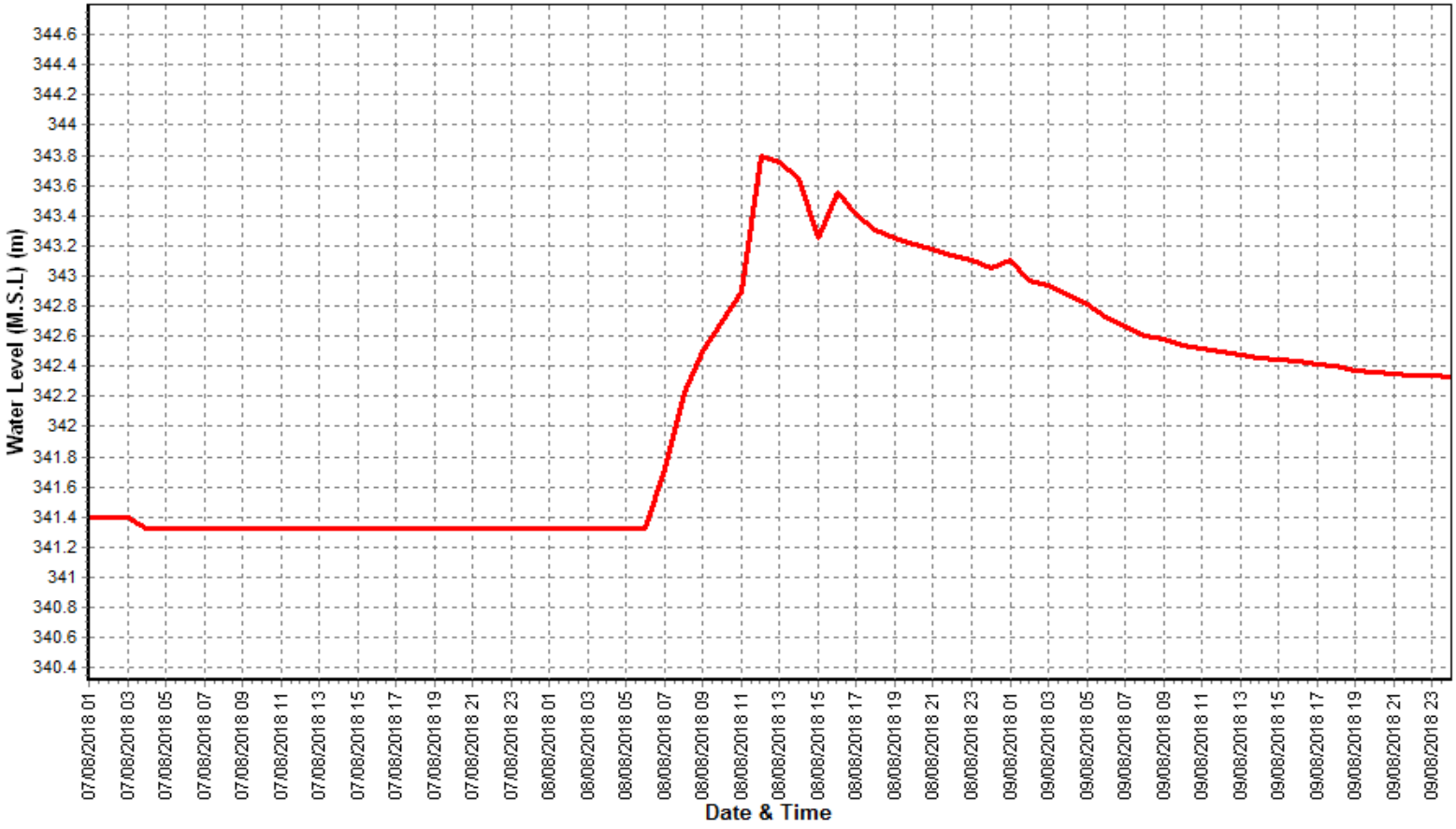
Sub-Division : MNSD I, CWC Hoshangabad



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Sher at Belkheri (010215010) Division : Narmada Division, Bhopal

Local River : Sher Sub-Division : MNSD I, CWC Hoshangabad



Water

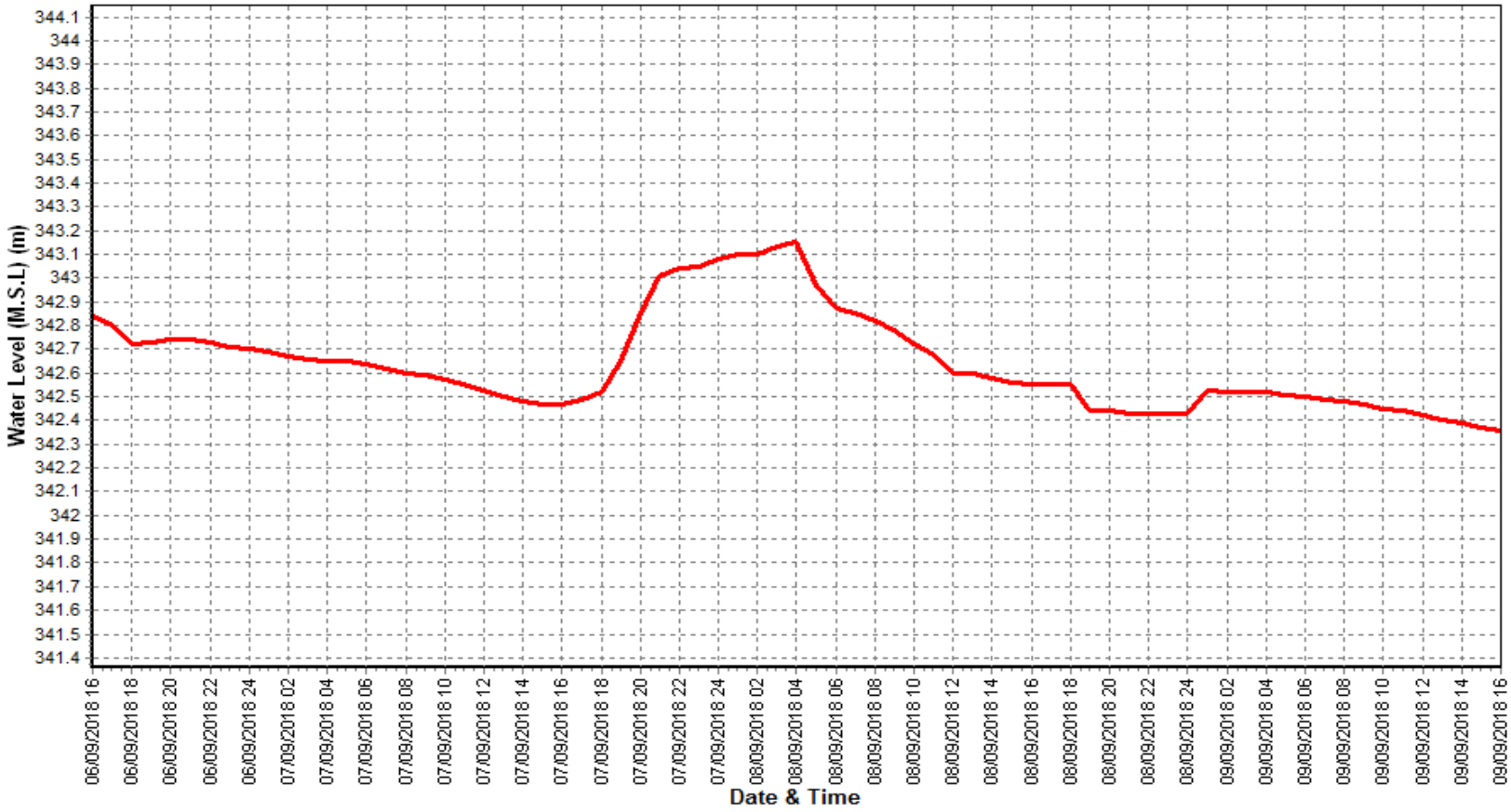
Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

Sub-Division : MNSD I, CWC Hoshangabad



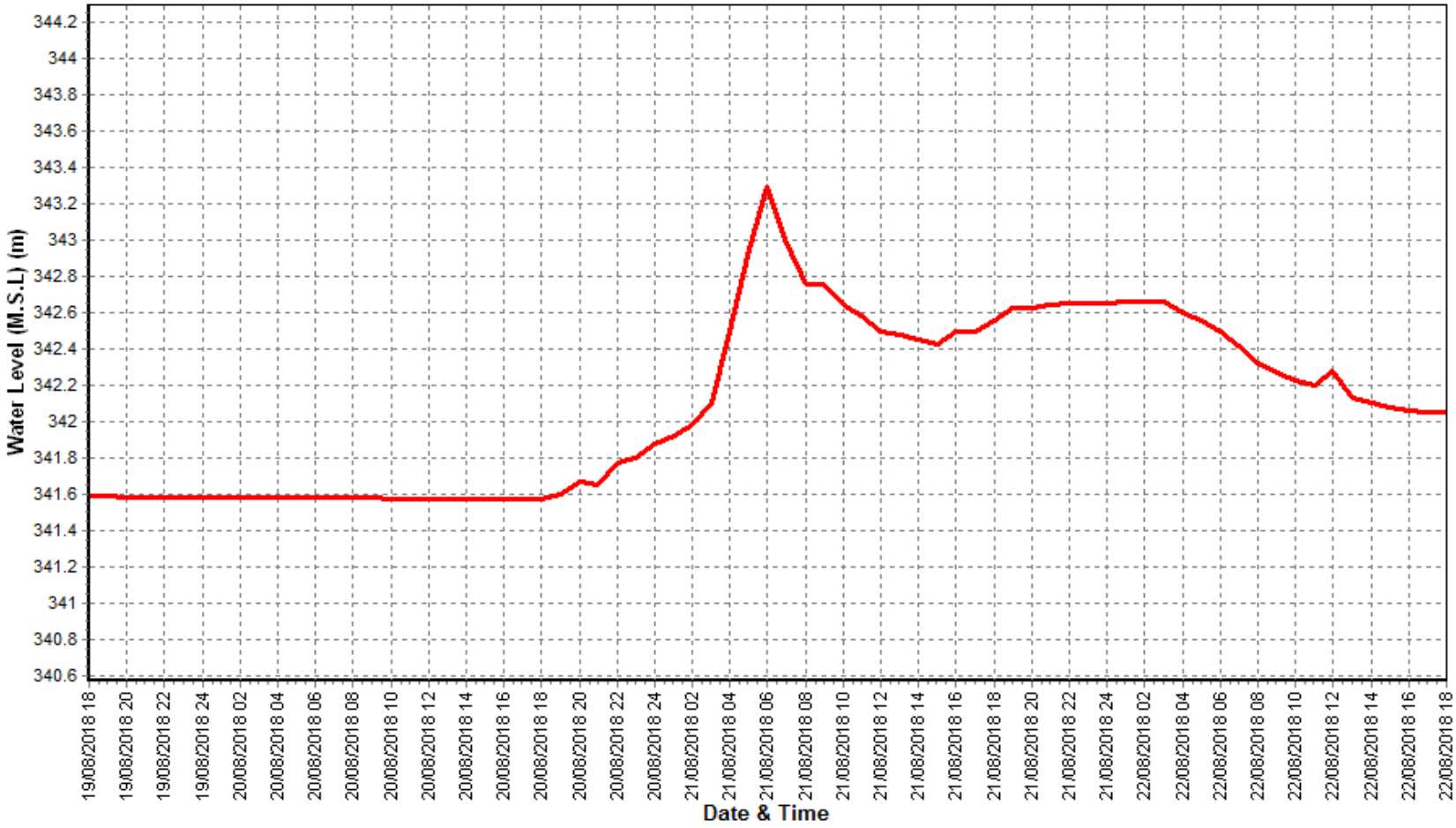
Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

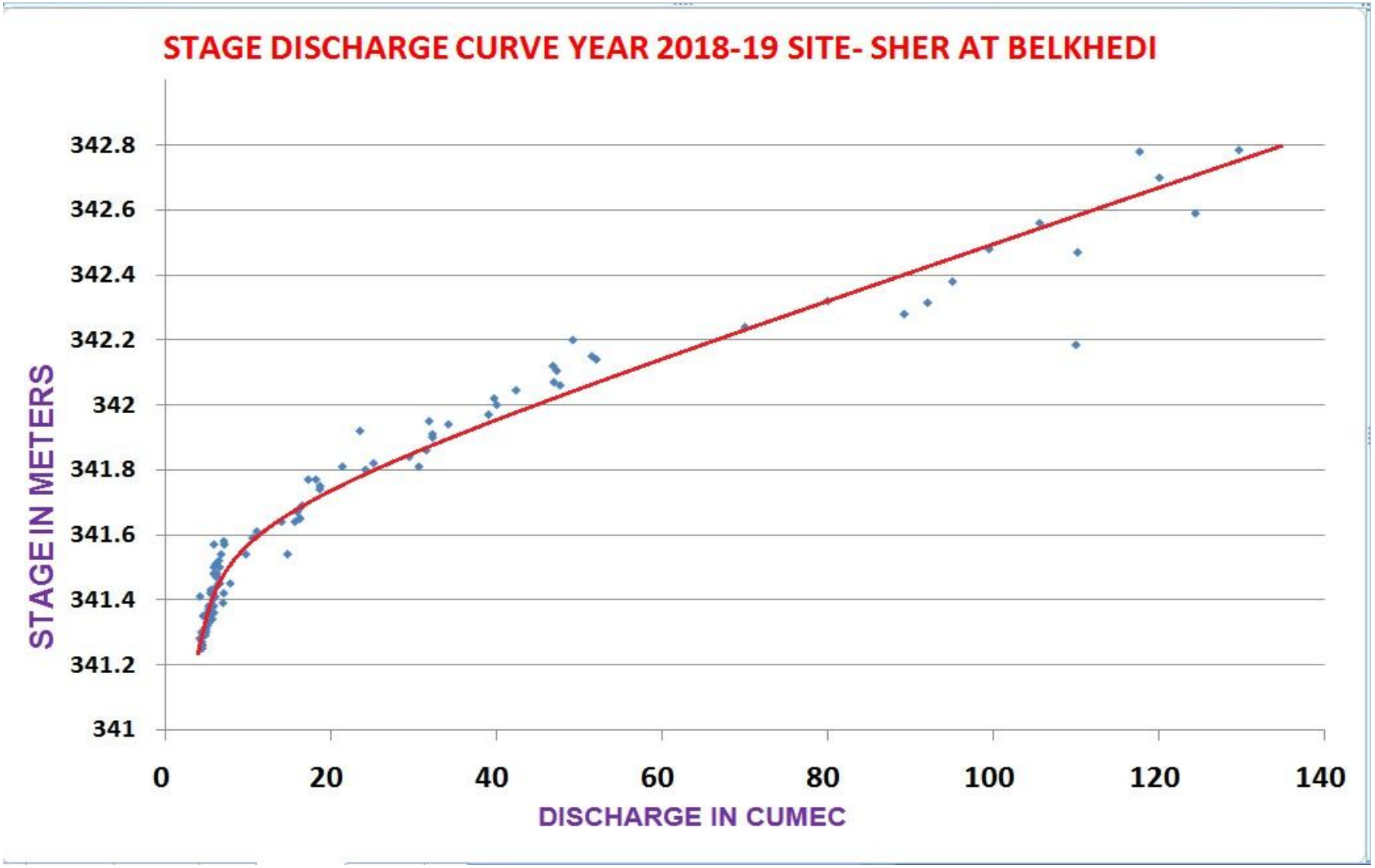
Station Name : Sher at Belkheri (010215010)

Division : Narmada Division, Bhopal

Local River : Sher

Sub-Division : MNSD I, CWC Hoshangabad




STAGE DISCHARGE CURVE YEAR 2018-19 SITE- SHER AT BELKHEDI
342.8
342.6
342.4
342.2
342
341.8
341.6
341.4
341.2
341
STAGE IN METERS
0
20
40
60
80
100
120
140
DISCHARGE IN CUMEC

4.12 Hiran at Patan

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Patan	**Code**	:	006-NDBHP
State	:	Madhya Pradesh	**District**	:	Jabalpur
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	Heran	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Heran
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	3950.0 Sq. Km.	**Bank**	:	Left
Latitude	:	23°18'42''	**Longitude**	:	79°39'45''
Current Zero of Gauge (m)	:	338.5			

CATEGORY		Opening Date	Closing Date
Gauge	:	30/08/1979	
Discharge	:	30/08/1979	
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
341.5	30/08/1979	31/12/2020
338.5	24/05/2019	24/05/2025
341.5	14/10/2016	23/05/2019

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1979-1980	12.2	342.355	01/12/1979	0	0	01/06/1979
1980-1981	1666	355.66	30/08/1980	0.4	341.855	01/06/1980
1981-1982	202	346.19	08/08/1981	0.8	341.84	14/06/1981
1982-1983	1981	354.313	10/08/1982	1.3	342.07	30/05/1983
1983-1984	1640	355.67	10/09/1983	1.2	342.54	06/06/1983
1984-1985	1275	352.85	24/08/1984	1.3	342.34	31/05/1985
1985-1986	1118	351.35	09/08/1985	1.3	342.34	01/06/1985
1986-1987	440	347.44	06/08/1986	1.6	342.29	20/05/1987
1987-1988	1200	352.37	17/09/1987	1.06	342.32	01/07/1987
1988-1989	1200	352.35	05/08/1988	1.29	342.31	31/05/1989
1989-1990	310	346.400	15/08/1989	0.37	342.795	14/05/1990
1990-1991	1270	351.27	20/09/1990	1.64	342.93	01/06/1990
1991-1992	1680	354.95	25/08/1991	1.6	342.36	06/06/1991
1992-1993	1880	356.08	13/09/1992	1.29	342.485	29/06/1992
1993-1994	1086	351.6	10/09/1993	1.5	342.25	11/06/1993
1994-1995	1660	354.7	02/08/1994	2.32	342.17	31/05/1995
1995-1996	1415	353.605	11/08/1995	1.05	342.25	31/05/1996
1996-1997	234	345.62	18/08/1996	0	342.05	20/03/1997
1997-1998	1295	351.85	07/08/1997	0	341.925	01/06/1997
1998-1999	488	347.65	07/08/1998	0.73	342.21	19/05/1999
1999-2000	1620	353.23	09/08/1999	0.9	342.19	15/06/1999
2000-2001	756	349.6	20/07/2000	0.05	341.8	19/05/2001
2001-2002	580	347.75	27/07/2001	0.25	341.8	01/06/2001
2002-2003	1302	352.5	19/08/2002	1.07	342.2	03/06/2002
2003-2004	1360	352.62	16/09/2003	0.56	342.16	11/06/2003
2004-2005	1175	352.25	23/08/2004	1.24	342.06	31/05/2005
2005-2006	1930	356.8	06/07/2005	0.39	341.97	26/06/2005
2006-2007	254.94	347.05	25/08/2006	0.15	341.7	31/05/2007
2007-2008	663.16	348.61	22/08/2007	0	0	24/04/2008
2008-2009	945.33	350.3	08/07/2008	0.59	341.65	29/05/2009
2009-2010	937.53	350.65	11/09/2009	0.06	341.72	21/05/2010
2010-2011	866.13	350.025	26/07/2010	0	341.71	01/07/2010
2011-2012	1444.59	352.51	24/07/2011	0	341.77	01/06/2011

2012-2013	531.3	347.72	11/08/2012	0	0	16/05/2013
2013-2014	2202.29	355.14	20/08/2013	0	0	02/06/2013
2014-2015	779.82	349.2	06/08/2014	0.5	341.51	20/05/2015
2015-2016	380.45	347.18	04/08/2015	0.06	341.51	11/04/2016
2016-2017	872.73	349.74	20/08/2016	1.05	341.54	07/04/2017
2017-2018	144	344.55	23/07/2017	2.4	341.62	02/07/2017
2018-2019	872	350.55	29/08/2018	1.61	341.53	08/07/2018

Stage Discharge Sheet for Hiran at Patan for the period 2018-19

Day	Jun		Jul			Aug			Sep			Oct		
	W.L	Q	W.L	Q		W.L	Q		W.L	Q		W.L	Q	
1			341.770	8.340	*	342.880	45.68	*	347.950	581.2	*	342.420	26.15	*
2			341.760	8.260		342.700	40.73	*	349.000	708.4	*	342.410	25.85	*
3			341.680	6.600		343.060	50.83	*	348.290	616.8	*	342.390	25.10	*
4			341.580	3.981		342.890	45.97	*	346.410	341.8	*	342.370	24.52	*
5			341.560	1.560		342.640	36.45	*	345.860	270.5	*	342.440	26.63	*
6			341.500	0.000		342.430	26.20	*	345.550	247.1	*	342.400	25.41	*
7			341.500	0.000		342.420	26.04	*	345.080	206.4	*	342.390	25.15	*
8			341.530	1.614	*	342.620	35.46	*	345.430	237.8	*	342.380	24.78	*
9			341.700	6.831		344.090	128.2	*	345.510	518.3	*	342.380	24.82	*
10			341.690	6.679		345.150	212.7	*	345.680	257.2	*	342.370	24.46	*
11			342.470	26.93		344.350	144.6	*	344.960	197.3	*	342.440	26.67	*
12			342.590	32.92		344.190	134.6	*	344.710	168.5	*	342.540	30.98	*
13			343.890	111.7		343.870	110.2	*	344.300	140.7	*	342.550	31.75	*
14			342.630	24.05		344.540	156.9	*	343.560	94.00	*	342.600	33.78	*
15			343.000	48.80	*	343.830	107.8	*	343.320	81.17	*	342.640	38.54	*
16			342.140	17.12		343.830	107.7	*	343.230	69.40	*	342.760	42.38	*
17			342.210	18.87		344.150	132.6	*	343.090	51.87	*	342.740	41.74	*
18			344.300	140.8		344.510	155.1	*	342.940	47.37	*	342.740	41.87	*
19			346.300	333.6		343.720	101.5	*	342.790	43.39	*	342.730	41.66	*
20			344.310	141.4		344.660	164.6	*	342.660	39.52	*	342.760	42.28	*
21			343.090	51.71	*	348.860	683.1	*	342.620	35.30	*	342.620	35.90	*
22			342.860	44.30	*	348.340	626.4	*	342.560	31.85	*	342.710	40.85	*
23			346.960	456.0	*	347.290	491.1	*	342.510	29.10	*	342.730	41.49	*
24			348.760	670.6	*	345.650	255.3	*	342.860	44.86	*	342.630	37.87	*
25			348.600	649.3	*	345.160	213.3	*	342.730	41.62	*	342.520	30.10	*
26			345.400	231.9	*	344.900	194.3	*	342.560	31.90	*	342.440	26.68	*
27			345.160	213.9	*	344.730	169.5	*	342.500	28.97	*	342.410	25.76	*
28			344.950	197.0	*	344.570	158.3	*	342.480	27.91	*	342.350	23.90	*
29			344.260	139.6	*	350.550	877.0	*	342.470	27.26	*	342.270	21.86	*
30			343.630	96.71	*	349.250	712.3	*	342.450	26.90	*	342.120	18.82	*
31			343.410	85.66	*	348.120	601.2	*				342.070	17.49	*
Ten-Daily Mean														
I Ten-Daily			341.627	5.483		343.088	64.83		346.476	398.6		342.395	25.29	
II Ten-Daily			343.384	89.62		344.165	131.6		343.556	93.32		342.650	37.17	
III Ten-Daily			345.189	257.9		347.038	452.9		342.574	32.57		342.443	29.16	
Monthly														
Min.			341.500	1.560		342.420	26.04		342.450	26.90		342.070	17.49	
Max.			348.760	670.6		350.550	877.0		349.000	708.4		342.760	42.38	
Mean			343.458	130.2		344.837	224.1		344.202	174.8		342.494	30.49	

Annual Runoff in MCM = 1461 Annual Runoff in mm = 370

Peak Observed Discharge = 333.6 cumecs on 19/07/2018 Corres. Water Level :346.3 m

Lowest Observed Discharge = 1.560 cumecs on 05/07/2018 Corres. Water Level :341.56 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Hiran at Patan for the period 2018-19

Day	Nov		Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
Ten-Daily Mean														
I Ten-Daily														
II Ten-Daily														
III Ten-Daily														
Monthly														
Min.														
Max.														
Mean														

Peak Computed Discharge = 877.0 cumecs on 29/08/2018 Corres. Water Level :350.55 m

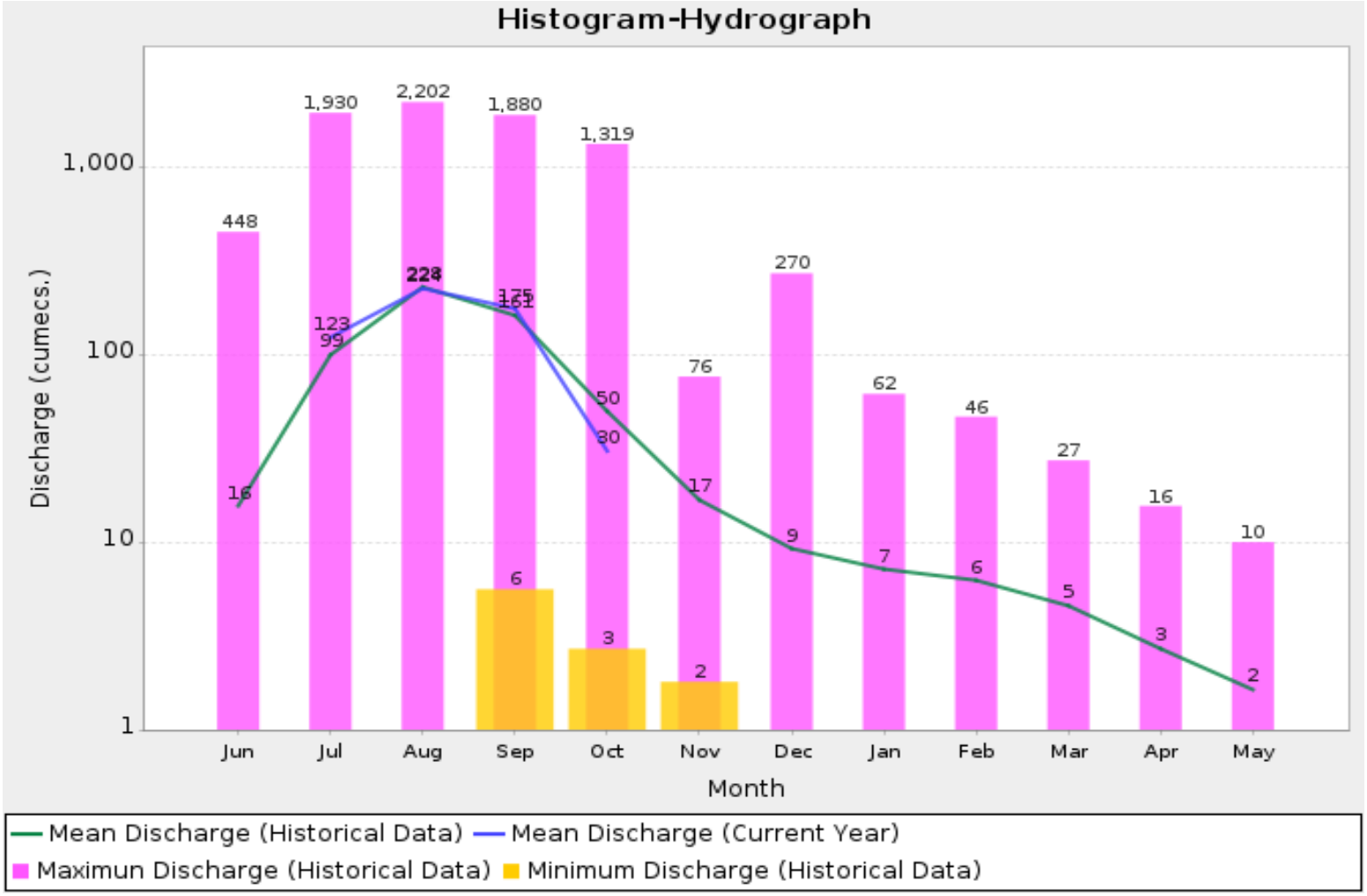
Lowest Computed Discharge = 1.614 cumecs on 08/07/2018 Corres. Water Level :341.53 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1979-2019)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

Local River : Hiran Sub-Division : UNSD, CWC Jabalpur



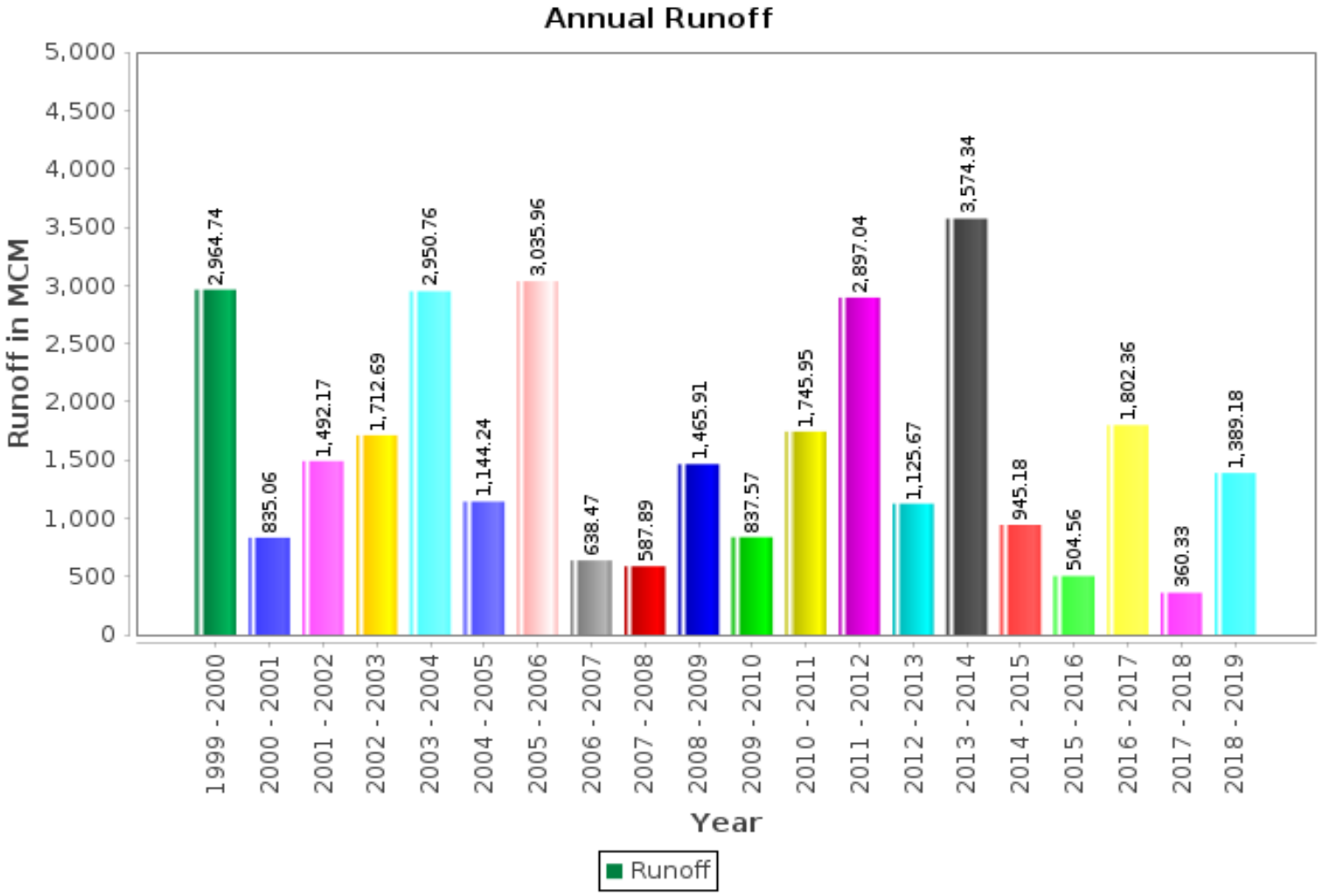
Annual Runoff Values for the period (1979 – 2019)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

Sub-Division : UNSD, CWC Jabalpur



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

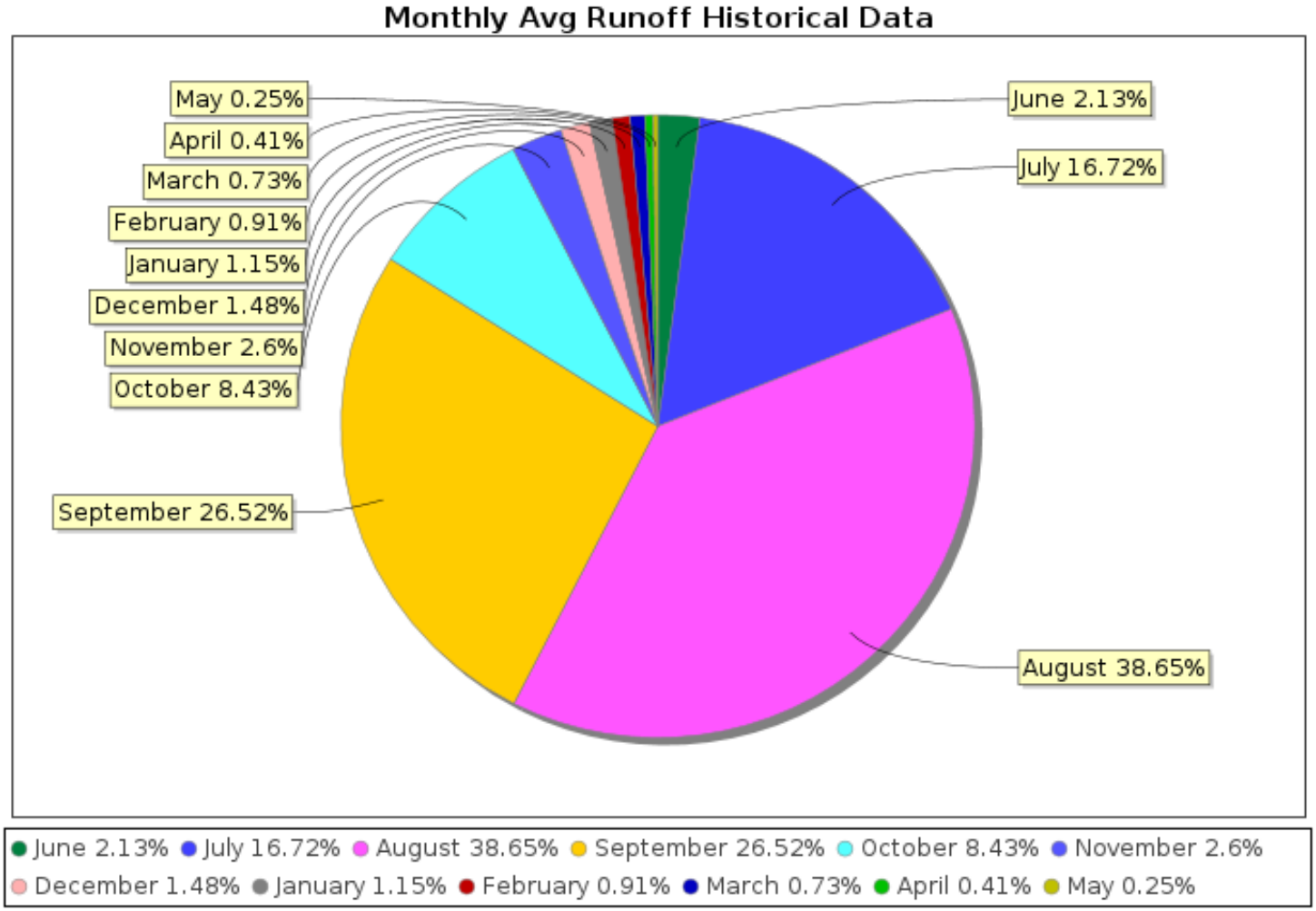
Monthly Average Runoff based on period (1979 – 2019)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

Sub-Division : UNSD, CWC Jabalpur



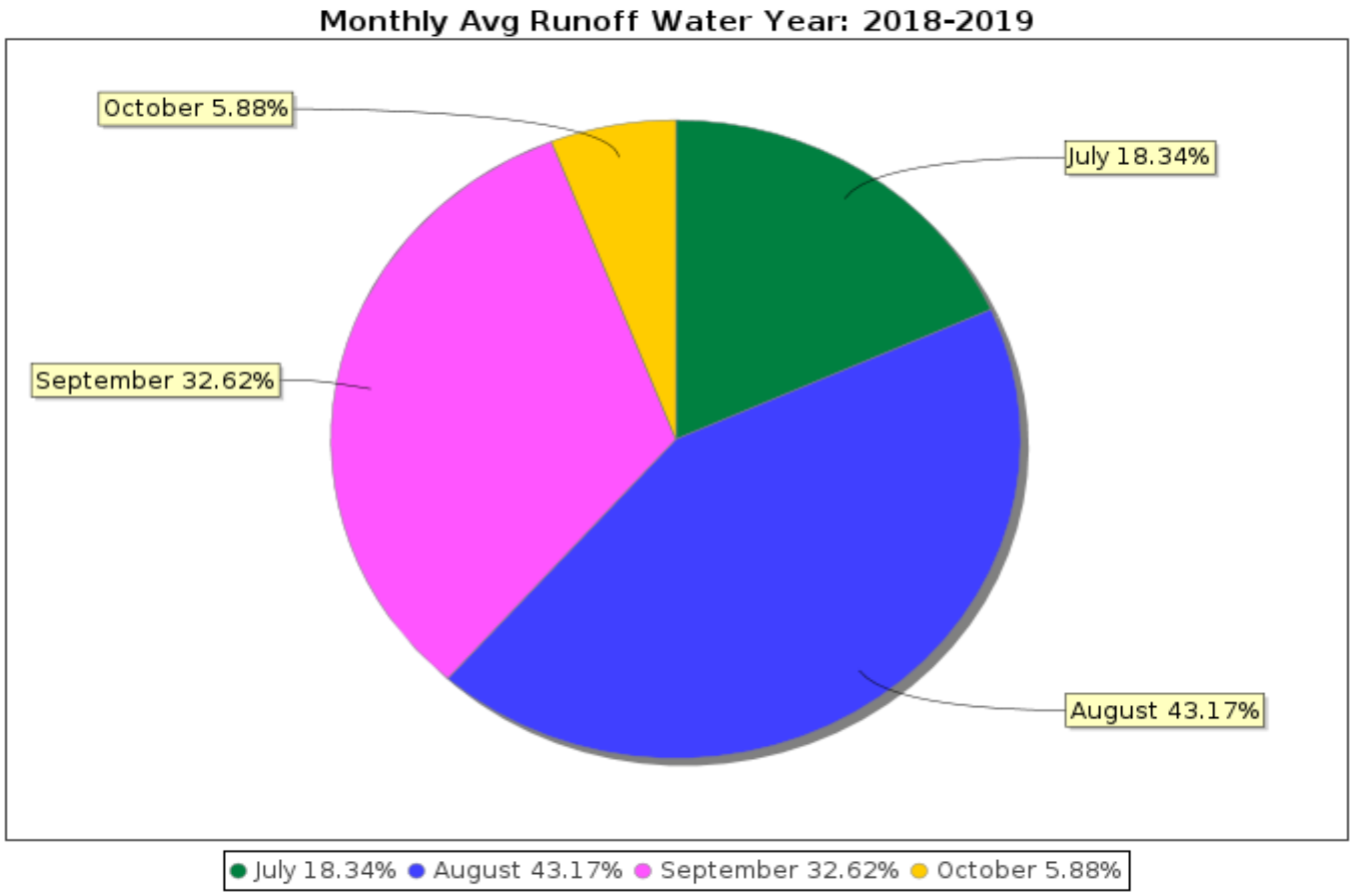
Monthly Runoff for the Year (2018-19)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

Sub-Division : UNSD, CWC Jabalpur



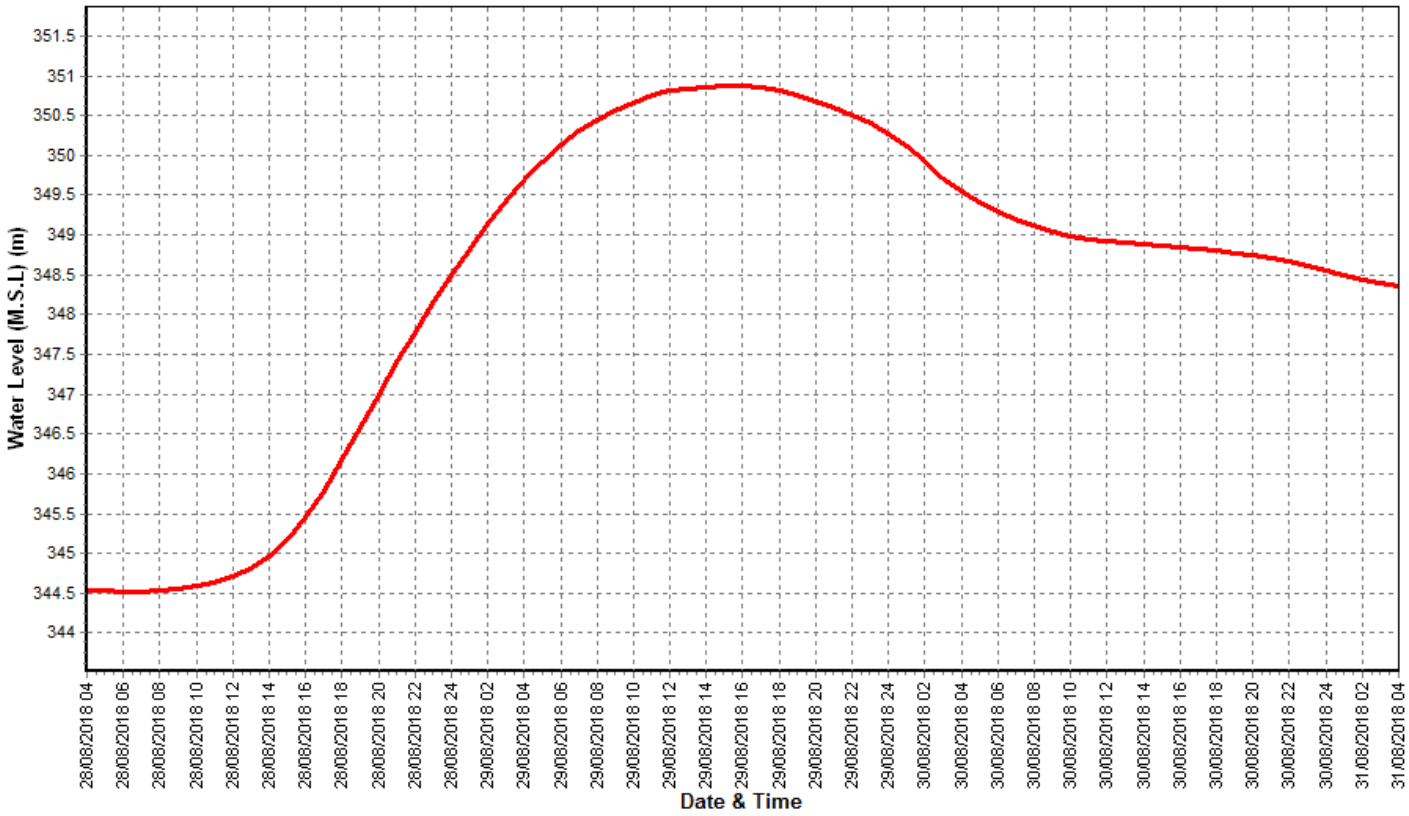
Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Hiran at Patan (010215009)

Division : Narmada Division, Bhopal

Local River : Hiran

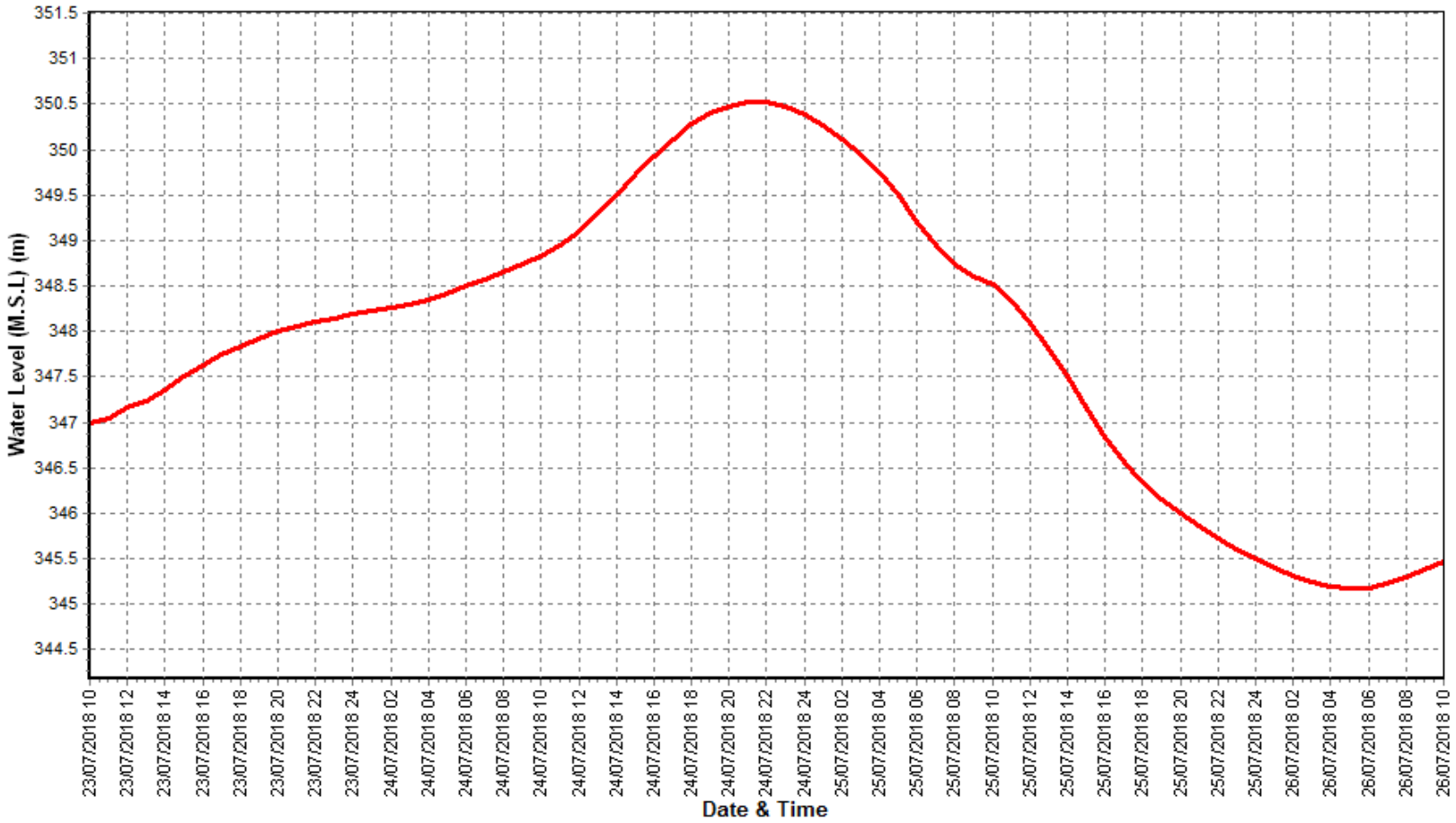
Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

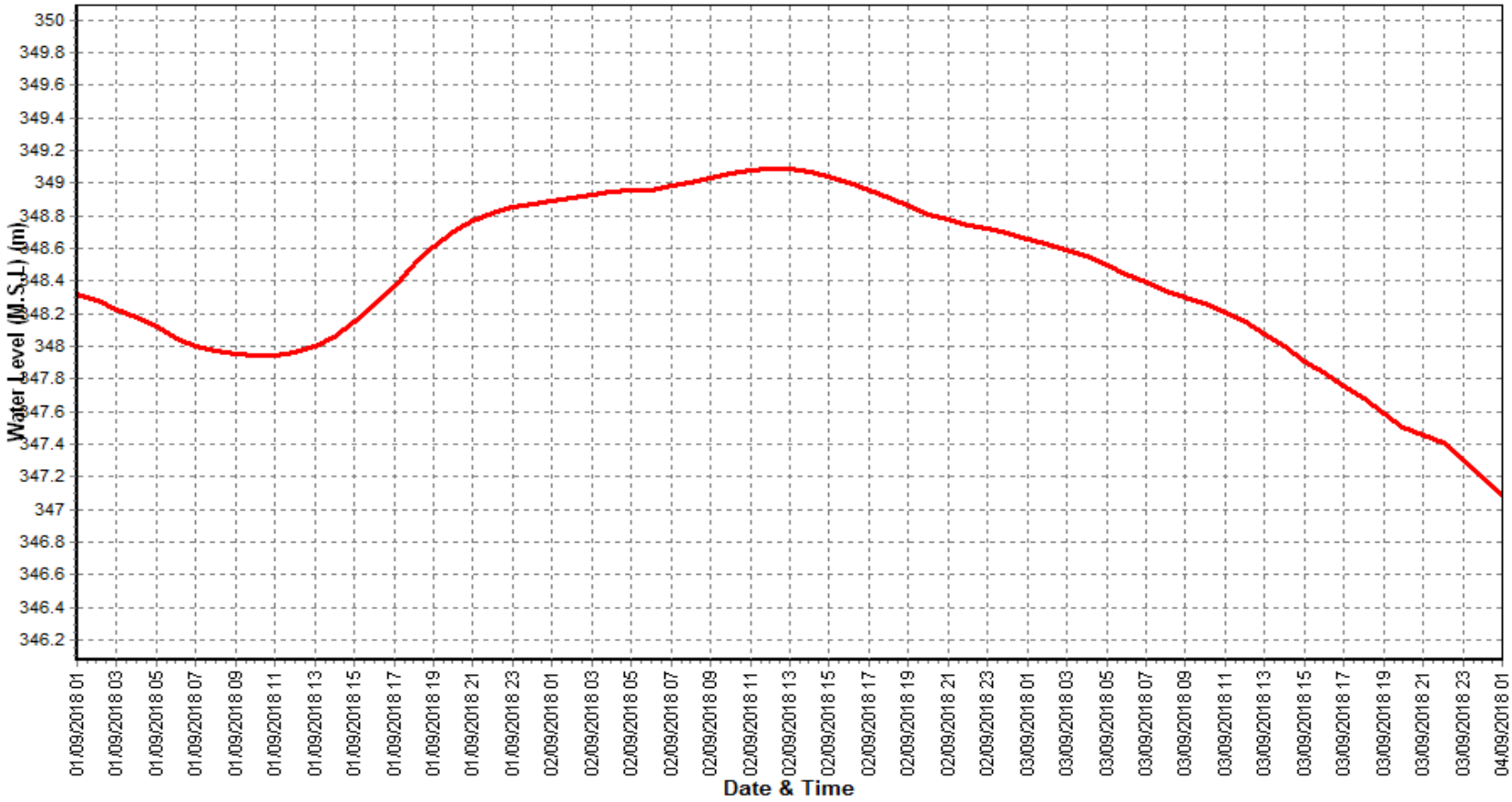
Local River : Hiran Sub-Division : UNSD, CWC Jabalpur

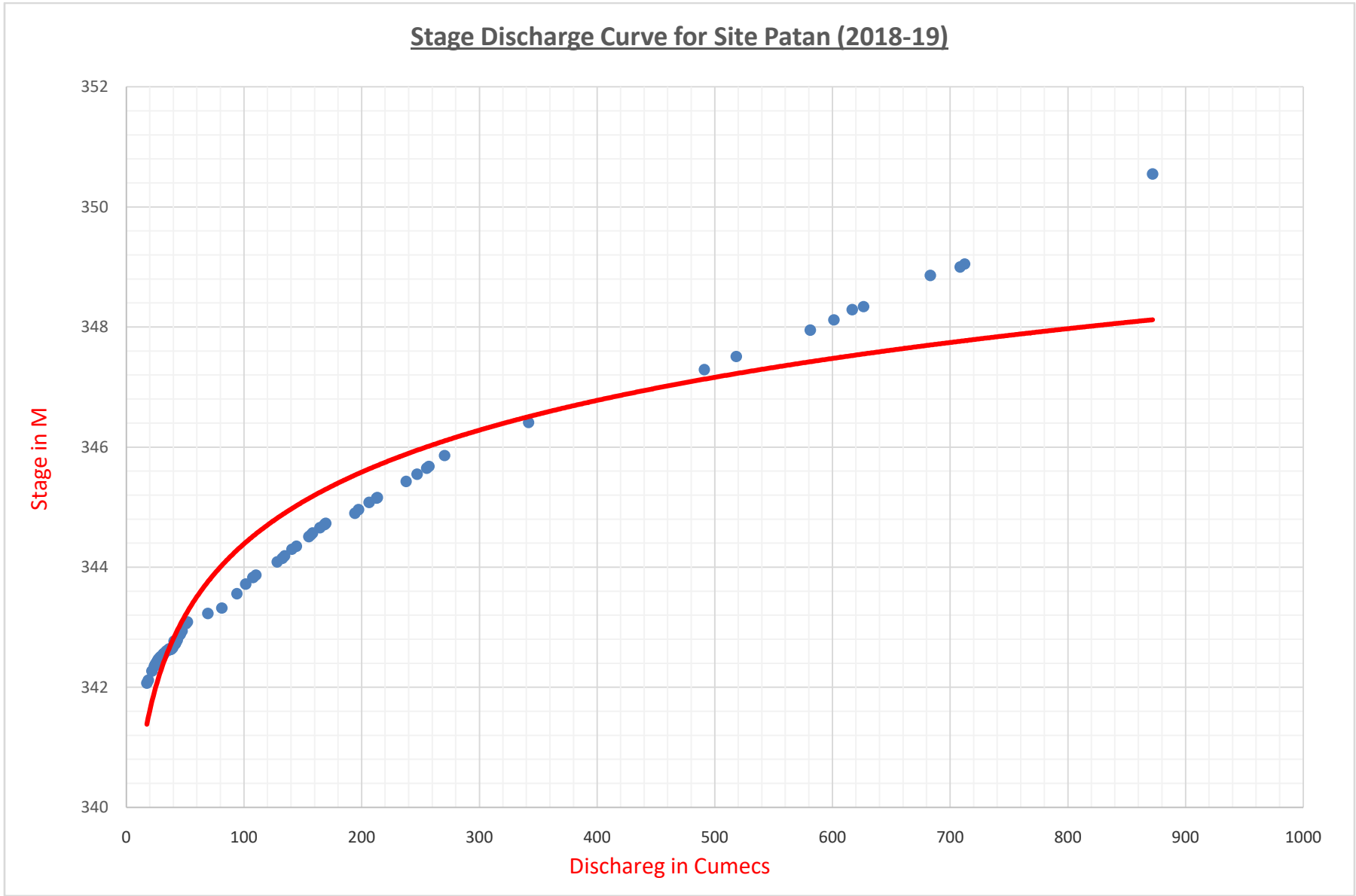


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Hiran at Patan (010215009) Division : Narmada Division, Bhopal

Local River : Hiran Sub-Division : UNSD, CWC Jabalpur




Stage Discharge Curve for Site Patan (2018-19)
Stage in M
352
350
348
346
344
342
340
0
100
200
300
400
500
600
700
800
900
1000
Dischareg in Cumecs

4.13 Banjar at Bamni

History sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Bamni	**Code**	:	002-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	1864.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°29'3''	**Longitude**	:	80°22'40''
Current Zero of Gauge (m)	:				

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
440.0	24/05/2014	03/06/2014
440.0	14/10/2016	15/10/2019
440.0	26/06/1999	24/05/2014
440.0	03/06/2014	14/10/2016

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
2001-2002	0	0	25/01/2002	0	0	25/01/2002
2002-2003	0	0	24/08/2002	0	0	24/08/2002
2004-2005	75.12	441.72	02/02/2005	0	0	01/04/2005
2005-2006	1455.9	446.93	15/09/2005	0	0	01/06/2005
2006-2007	681.41	444.5	14/08/2006	0	0	01/06/2006
2007-2008	391.5	443.85	20/08/2007	0	0	01/06/2007
2008-2009	406.03	443.8	01/08/2008	0	440.76	15/06/2008
2009-2010	488.86	443.65	22/07/2009	0	0	01/06/2009
2010-2011	360.97	443.025	26/07/2010	0	0	01/06/2010
2011-2012	403.94	443.4	08/09/2011	0	0	01/06/2011
2012-2013	285.25	443.2	23/08/2012	0	0	02/05/2013
2013-2014	517.65	444.12	22/08/2013	0	0	02/05/2014
2014-2015	524.67	444.18	23/07/2014	0	0	13/06/2014
2015-2016	301.19	443.22	05/08/2015	0	0	03/05/2016
2016-2017	550.5	444.43	07/08/2016	0.36	440.21	18/02/2017
2017-2018	123.9	441.39	21/07/2017	0	440.2	01/07/2017
2018-2019	594.3	442.51	24/07/2018	2.48	440.18	31/10/2018

Stage Discharge Sheet for Banjar at Bamni for the period 2018-19

Day	Jun		Jul		Aug		Sep		Oct	
	W.L	Q	W.L	Q	W.L	Q	W.L	Q	W.L	Q
1	0.0	0.0	440.120		440.260	22.41 *	440.640	112.3 *	440.260	14.71 *
2	0.0	0.0	440.160		440.230	18.13 *	440.560	97.00 *	440.250	14.00 *
3	0.0	0.0	440.160	8.221	440.210	15.89 *	440.450	43.58 *	440.250	13.34 *
4	0.0	0.0	440.140	8.000	440.190	14.69 *	440.400	39.99 *	440.250	12.72 *
5	0.0	0.0	440.190	9.529	440.180	10.00 *	440.420	41.43 *	440.240	11.99 *
6	0.0	0.0	440.180	9.165	440.170	9.565 *	440.525	94.57 *	440.240	11.53 *
7	0.0	0.0	440.250	11.22	440.230	18.01 *	440.550	97.38 *	440.240	11.00 *
8	0.0	0.0	440.210	9.810 *	440.310	31.81 *	440.570	99.40 *	440.230	9.845 *
9	0.0	0.0	440.210	9.846	440.530	94.73 *	440.450	43.00 *	440.230	9.658 *
10	0.0	0.0	440.570	100.4	440.550	96.87 *	440.410	41.15 *	440.230	9.199 *
11	0.0	0.0	440.420	42.51	440.720	184.2 *	440.370	38.09 *	440.230	9.007 *
12	0.0	0.0	440.730	187.3	440.480	43.00 *	440.340	31.88 *	440.220	7.175 *
13	0.0	0.0	440.910	263.8	440.680	126.6 *	440.320	31.00 *	440.220	6.984 *
14	0.0	0.0	441.030	301.5	440.490	41.37 *	440.300	30.21 *	440.220	6.890 *
15	0.0	0.0	440.720	184.8 *	440.460	38.10 *	440.290	29.12 *	440.220	6.797 *
16	0.0	0.0	440.580	104.4	440.460	38.29 *	440.280	25.80 *	440.210	6.467 *
17	0.0	0.0	440.890	253.7	440.625	111.8 *	440.270	22.56 *	440.210	6.272 *
18	0.0	0.0	441.150	336.3	440.500	42.40 *	440.260	20.52 *	440.210	6.056 *
19	0.0	0.0	440.830	241.4	440.430	36.20 *	440.250	18.31 *	440.210	5.500 *
20	0.0	0.0	440.620	110.7	440.545	96.48 *	440.250	17.84 *	440.200	4.040 *
21	0.0	0.0	440.510	43.10	440.700	180.0 *	440.240	17.00 *	440.200	3.940 *
22	0.0	0.0	440.520	44.20 *	440.630	111.0 *	440.260	20.45 *	440.200	3.845 *
23	0.0	0.0	440.650	114.1	440.480	41.14 *	440.310	30.60 *	440.200	3.838 *
24	0.0	0.0	442.510	594.3	440.420	37.17 *	440.360	37.84 *	440.200	3.686 *
25	0.0	0.0	441.255	363.6	440.370	33.58 *	440.370	38.51 *	440.190	3.546 *
26	0.0	0.0	440.590	107.2	440.330	32.00 *	440.330	31.27 *	440.190	3.329 *
27	0.0	0.0	440.640	112.0	440.350	33.44 *	440.310	30.51 *	440.180	3.179 *
28	0.0	0.0	440.520	60.93	440.830	242.1 *	440.290	26.15 *	440.180	2.865 *
29	0.0	0.0	440.430	42.90 *	440.910	264.0 *	440.280	23.51 *	440.180	2.550 *
30	0.0	0.0	440.360	32.94	441.350	335.8 *	440.270	19.11 *	440.180	2.531 *
31	0.0	0.0	440.300	30.96	440.740	190.7 *			440.180	2.482 *
Ten-Daily Mean	0..0	0..0								
I Ten-Daily	0.0	0.0	440.219	20.77	440.286	33.21	440.497	70.98	440.242	11.80
II Ten-Daily	0.0	0.0	440.788	202.6	440.539	75.84	440.293	26.53	440.215	6.519
III Ten-Daily	0.0	0.0	440.753	140.6	440.646	136.4	440.302	27.50	440.189	3.254
Monthly	0.0									
Min.	0.0		440.120	8.000	440.170	9.565	440.240	17.00	440.180	2.482
Max.	0.0		442.510	594.3	441.350	335.8	440.640	112.3	440.260	14.71
Mean	0.0		440.592	128.9	440.495	83.6	440.364	41.67	440.215	7.064

Annual Runoff in MCM = 674 Annual Runoff in mm = 362

Peak Observed Discharge = 594.3 cumecs on 24/07/2018 Corres. Water Level :442.51 m

Lowest Observed Discharge = 8.000 cumecs on 04/07/2018 Corres. Water Level :440.14 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Banjar at Bamni for the period 2018-19

Day	Nov			Dec			Jan			Feb			Mar			Apr			May		
	W.L	Q		W.L	Q		WL	Q		WL	Q		WL	Q		WL	Q		WL	Q	
1	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	0.0	0.0	0.0	0.0	0.0	0.0
2	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	0.0	0.0	0.0	0.0	0.0	0.0
3	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	0.0	0.0	0.0	0.0	0.0	0.0
4	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	0.0	0.0	0.0	0.0	0.0	0.0
5	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	0.0	0.0	0.0	0.0	0.0	0.0
6	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	0.0	0.0	0.0	0.0	0.0	0.0
7	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	0.0	0.0	0.0	0.0	0.0	0.0
8	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	0.0	0.0	0.0	0.0	0.0	0.0
9	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	0.0	0.0	0.0	0.0	0.0	0.0
10	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	0.0	0.0	0.0	0.0	0.0	0.0
11	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	0.0	0.0	0.0	0.0	0.0	0.0
12	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	0.0	0.0	0.0	0.0	0.0	0.0
13	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	0.0	0.0	0.0	0.0	0.0	0.0
14	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	0.0	0.0	0.0	0.0	0.0	0.0
15	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	0.0	0.0	0.0	0.0	0.0	0.0
16	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	0.0	0.0	0.0	0.0	0.0	0.0
17	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	0.0	0.0	0.0	0.0	0.0	0.0
18	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	0.0	0.0	0.0	0.0	0.0	0.0
19	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	0.0	0.0	0.0	0.0	0.0	0.0
20	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	0.0	0.0	0.0	0.0	0.0	0.0
21	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	0.0	0.0	0.0	0.0	0.0	0.0
22	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	0.0	0.0	0.0	0.0	0.0	0.0
23	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	0.0	0.0	0.0	0.0	0.0	0.0
24	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	0.0	0.0	0.0	0.0	0.0	0.0
25	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	0.0	0.0	0.0	0.0	0.0	0.0
26	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	0.0	0.0	0.0	0.0	0.0	0.0
27	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	0.0	0.0	0.0	0.0	0.0	0.0
28	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	0.0	0.0	0.0	0.0	0.0	0.0
29	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	0.0	0.0	0.0	0.0	0.0	0.0
30	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	0.0	0.0	0.0	0.0	0.0	0.0
31	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	0.0	0.0	0.0	0.0	0.0	0.0
Ten-Daily Mean	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	0.. 0	0.. 0	0.. 0	0.. 0	0.. 0	0.. 0
I Ten-Daily	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	0.0	0.0	0.0	0.0	0.0	0.0
II Ten-Daily	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	0.0	0.0	0.0	0.0	0.0	0.0
III Ten-Daily	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	0.0	0.0	0.0	0.0	0.0	0.0
Monthly	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	0.0	0.0	0.0	0.0	0.0	0.0
Min.	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	0.0	0.0	0.0	0.0	0.0	0.0
Max.	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	0.0	0.0	0.0	0.0	0.0	0.0
Mean	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	0.0	0.0	0.0	0.0	0.0	0.0

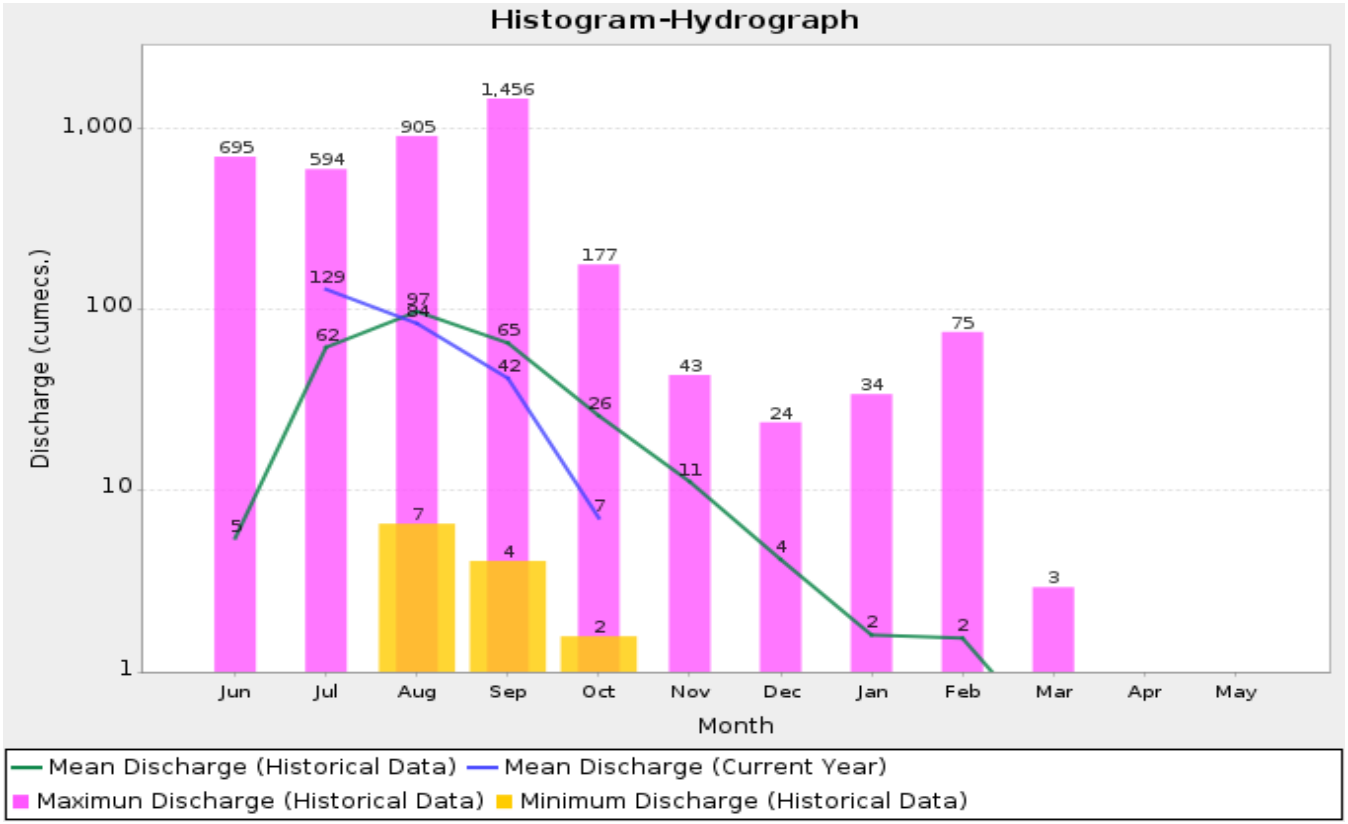
Peak Computed Discharge = 335.8 cumecs on 30/08/2018 Corres. Water Level :441.35 m
Lowest Computed Discharge = 2.482 cumecs on 31/10/2018 Corres. Water Level :440.18 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge
#:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19(Data considered : 2000-2019)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



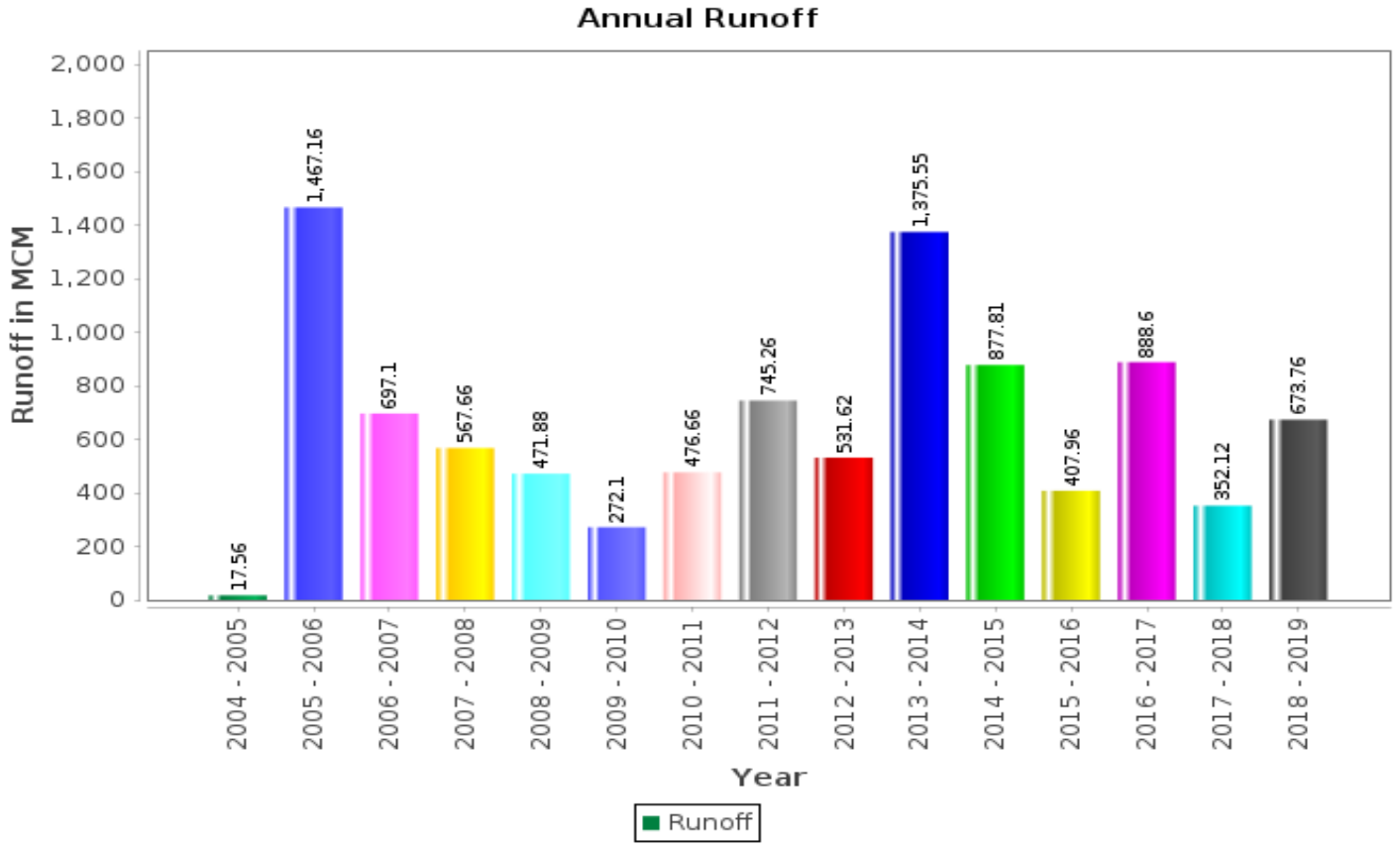
Annual Runoff Values for the period (2000-2019)

Station Name : Banjar at Bamni (NCA SITE)

Division : Narmada Division, Bhopal

Local River : Banjar

Sub-Division : UNSD, CWC Jabalpur

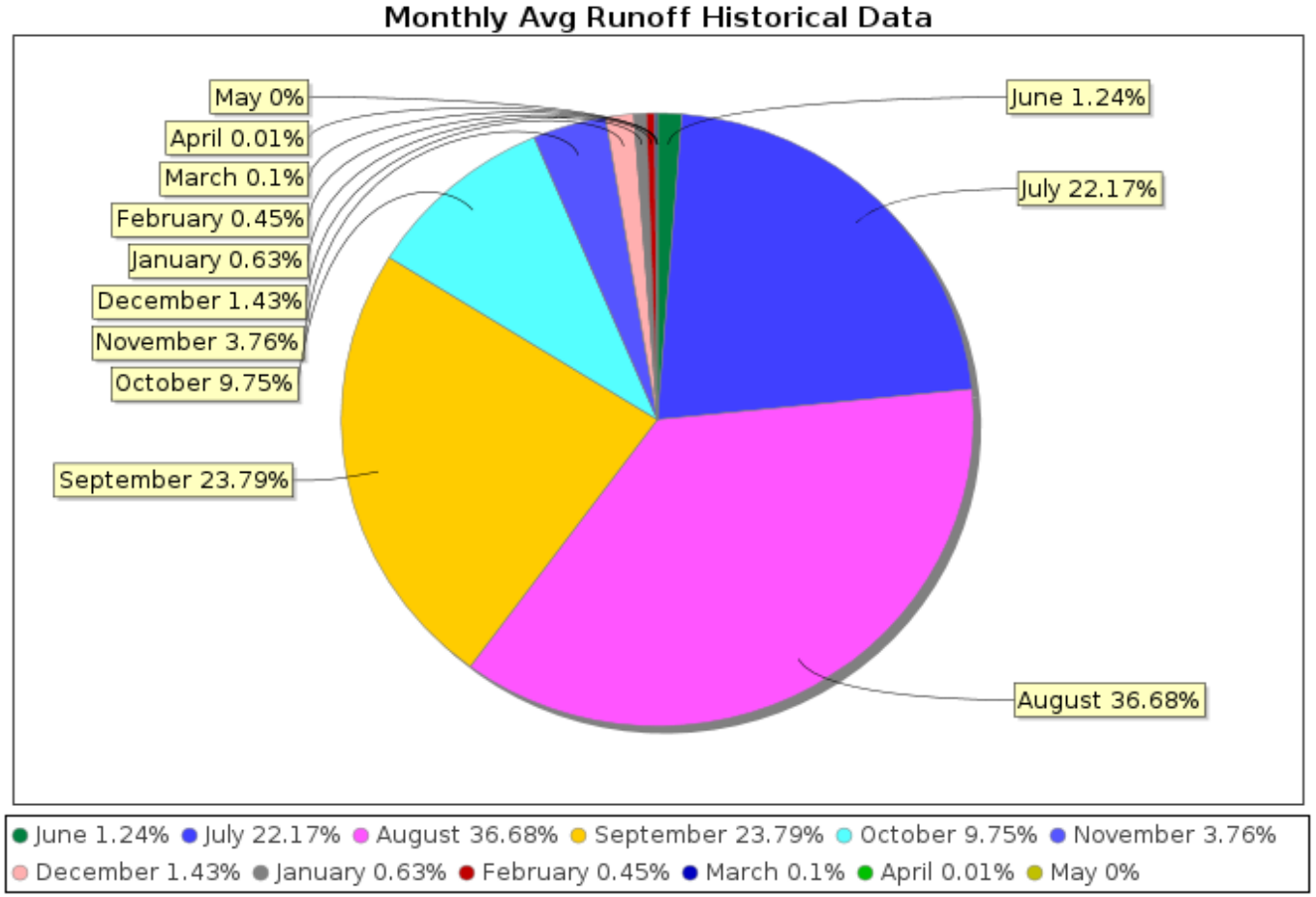


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (2000– 2019)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

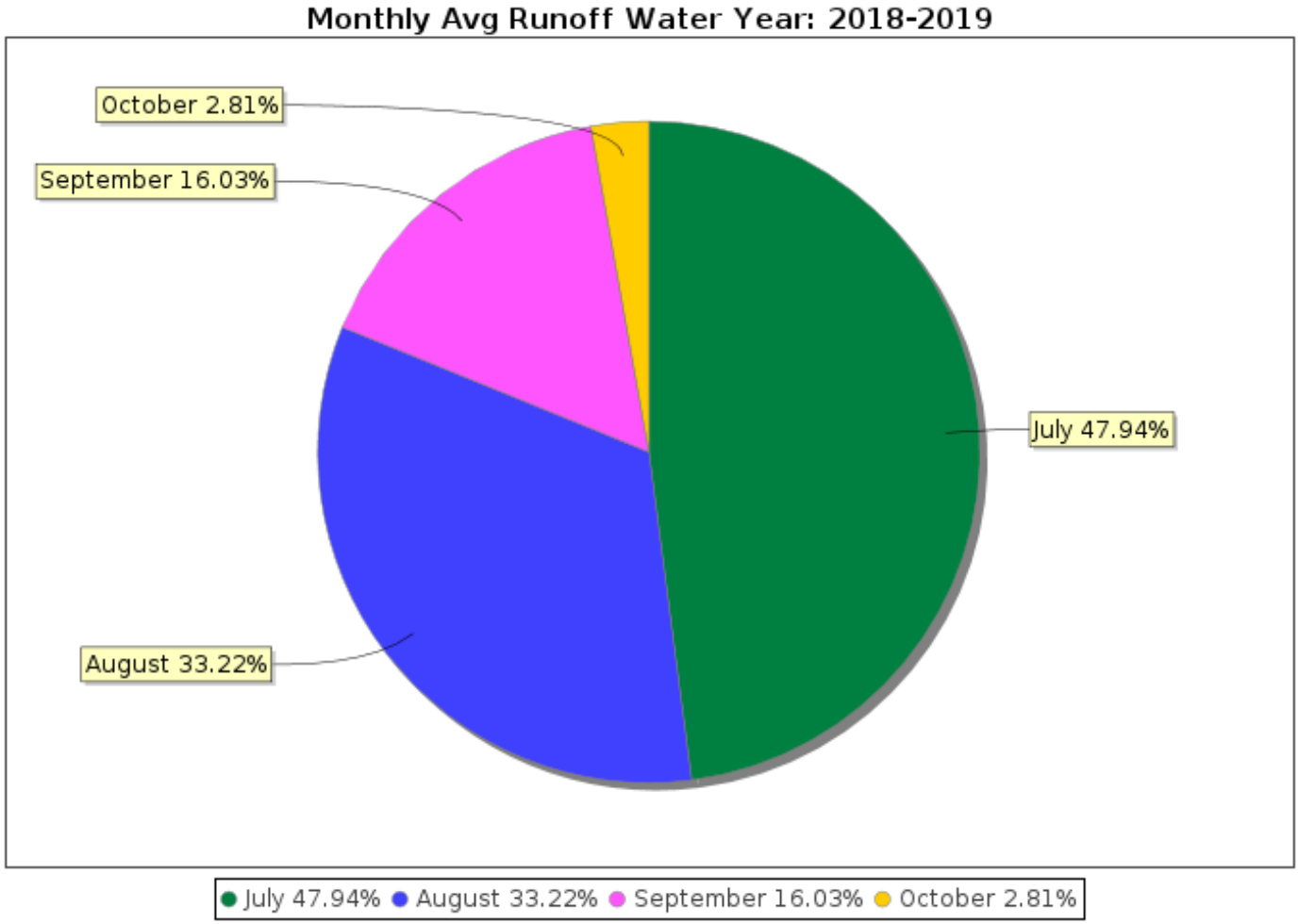
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2018-19)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

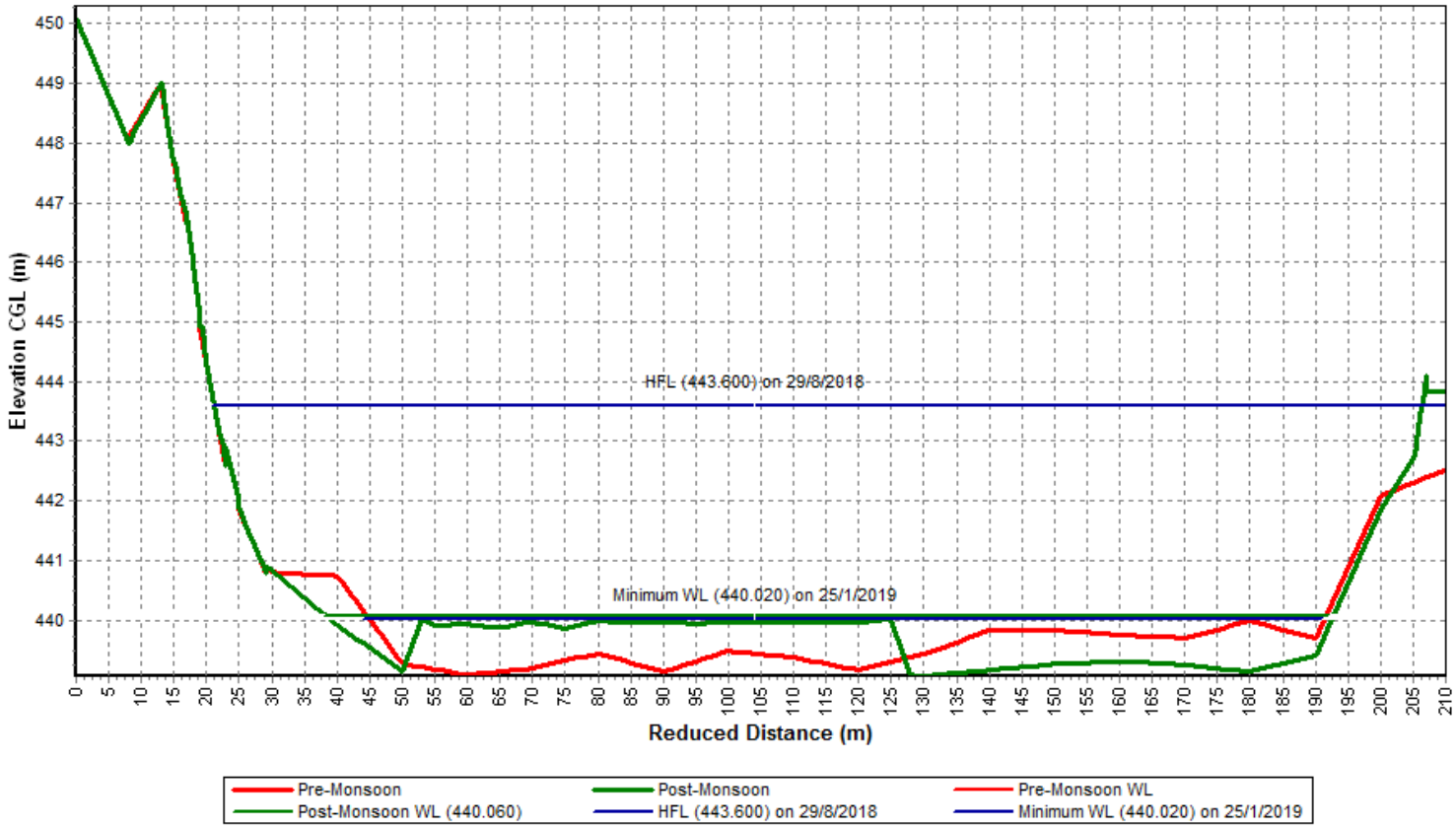
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

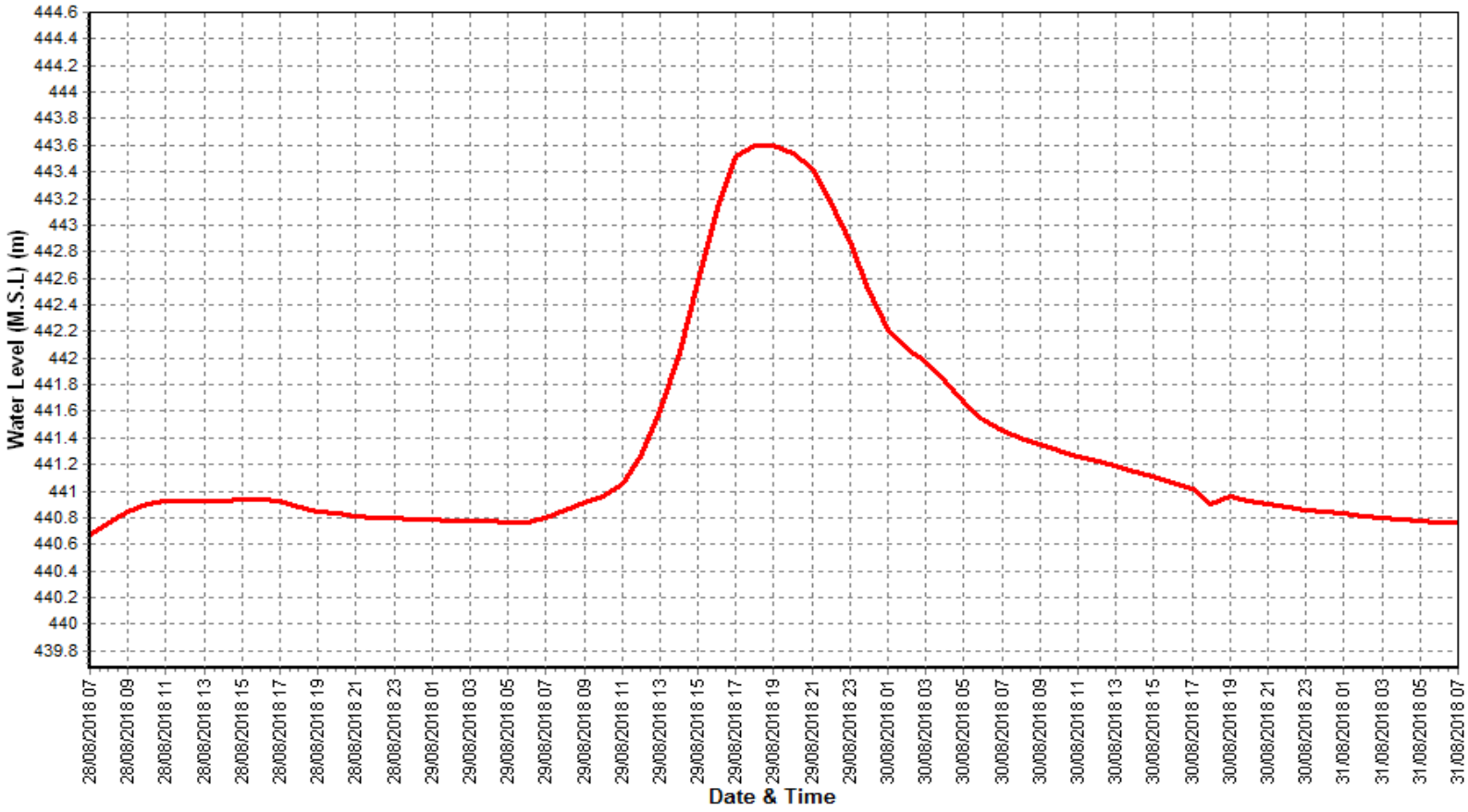
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

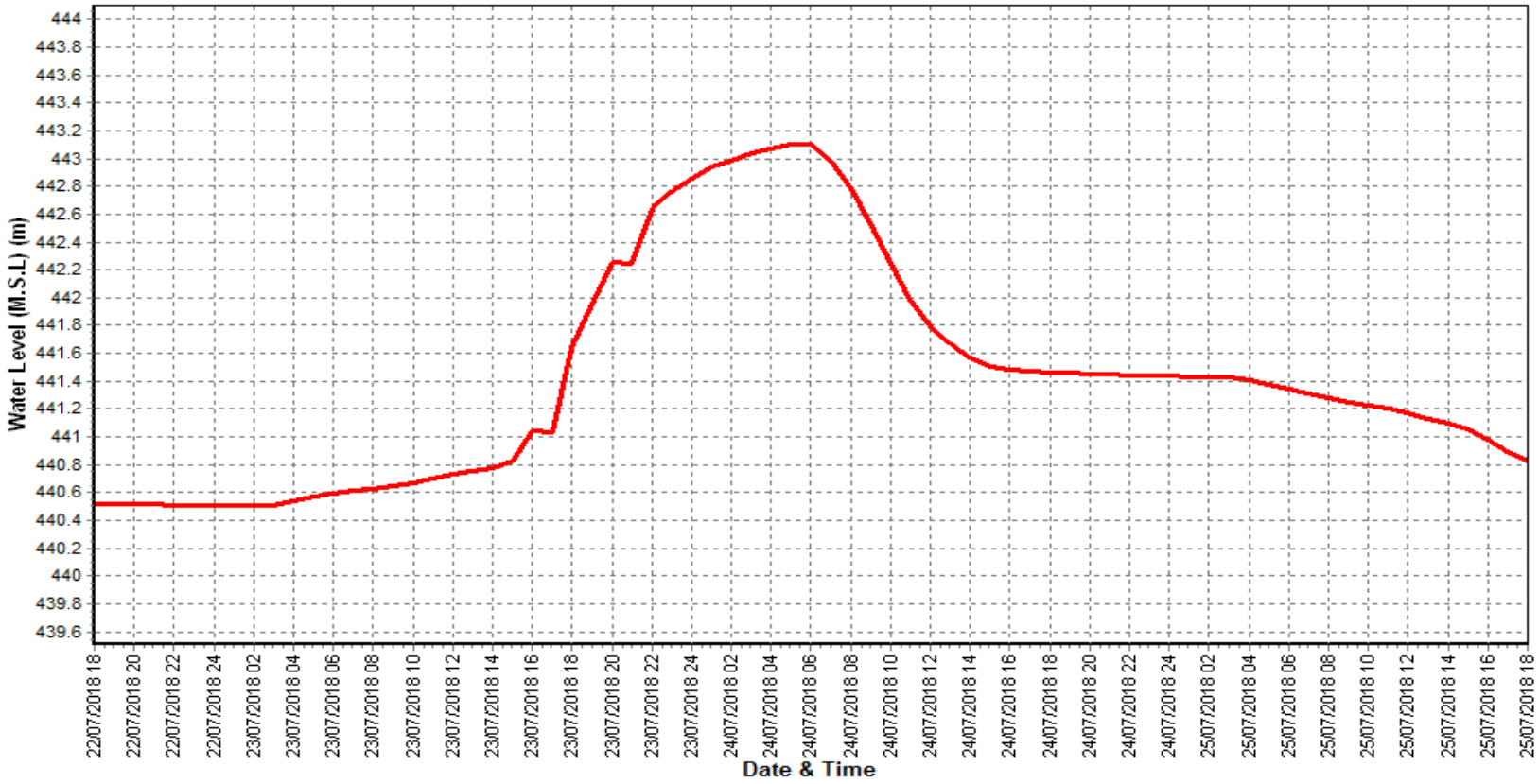
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

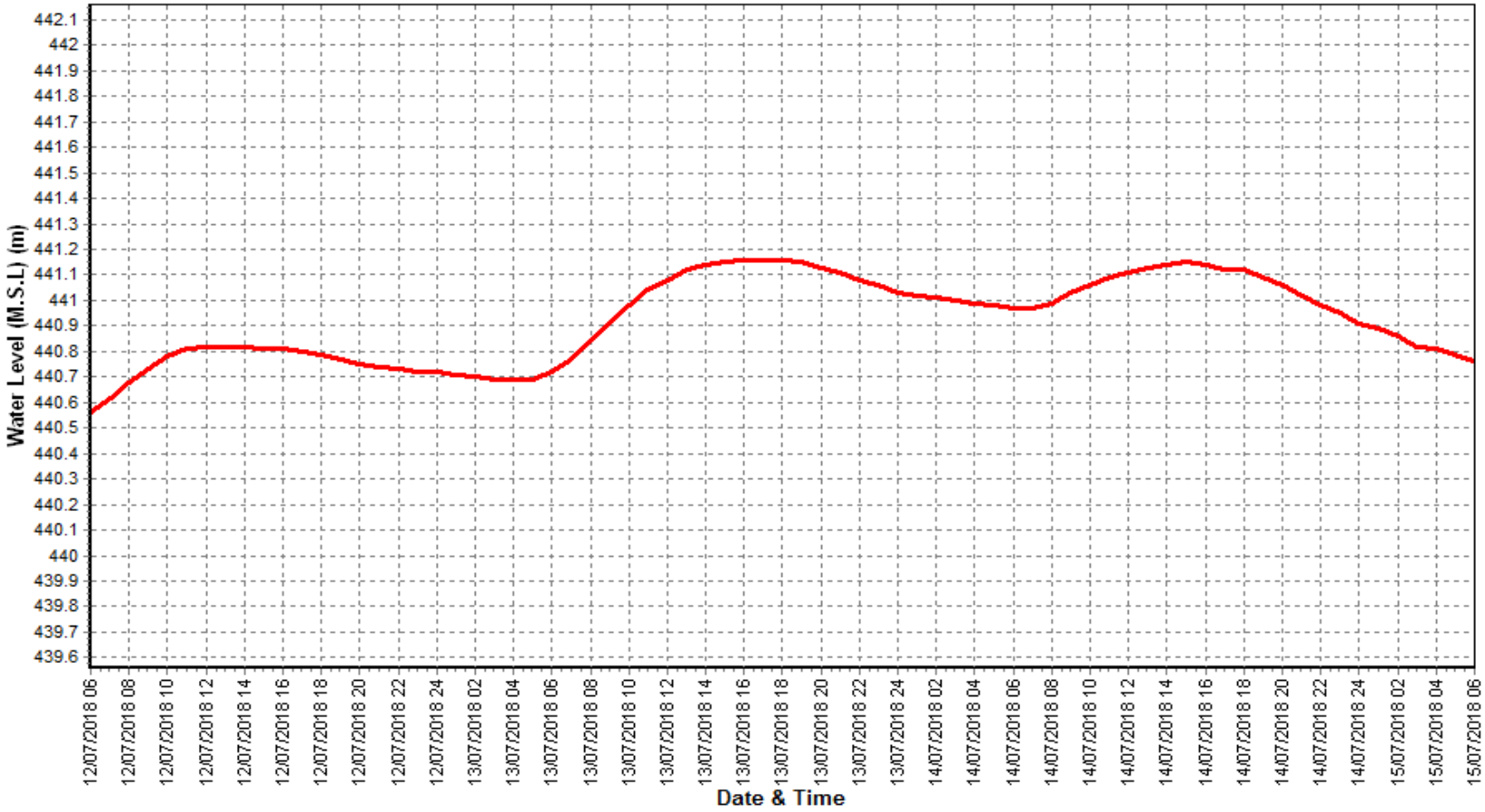
Local River : Banjar Sub-Division : UNSD, CWC Jabalpur

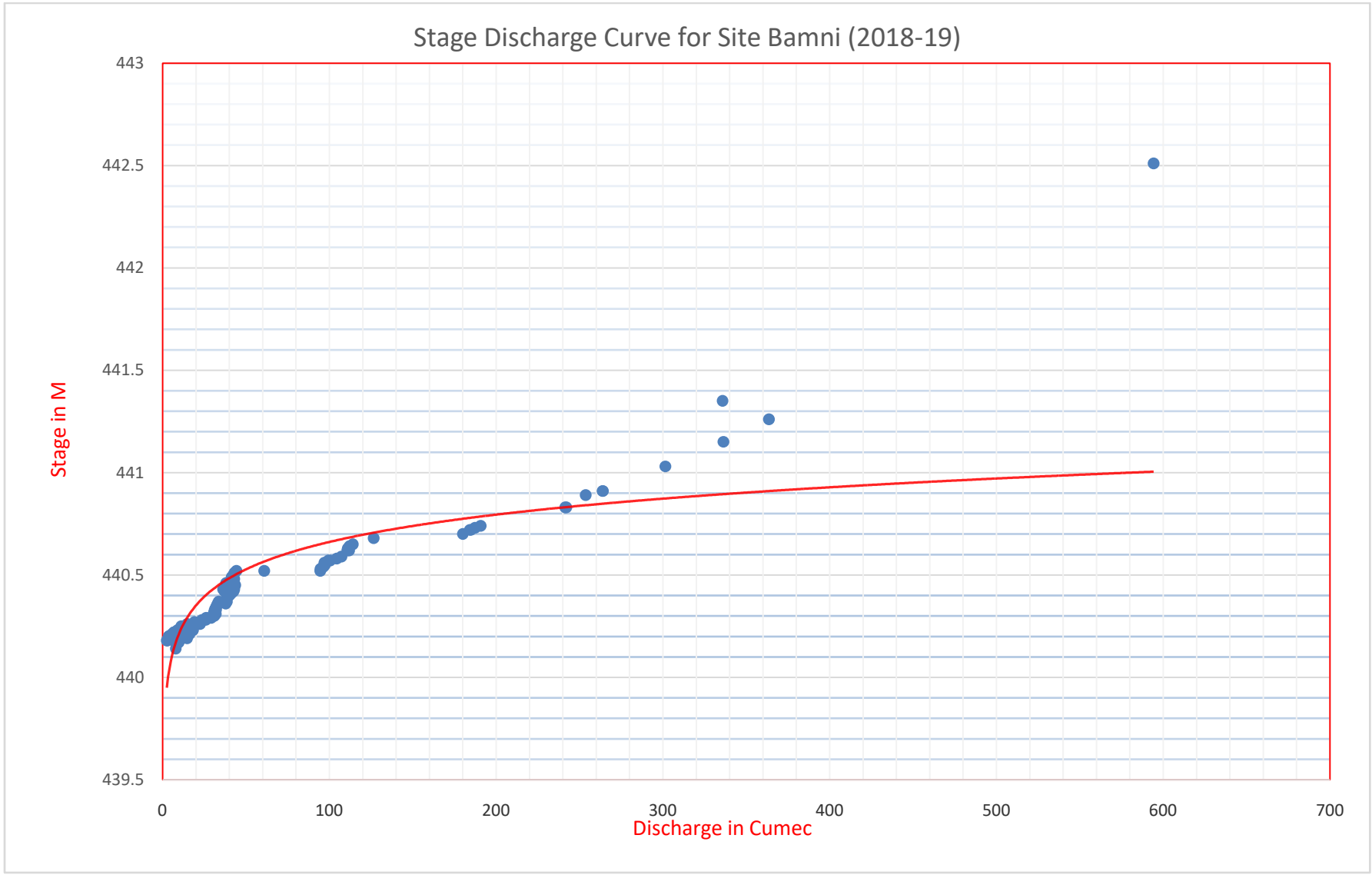


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Banjar at Bamni (NCA SITE) Division : Narmada Division, Bhopal

Local River : Banjar Sub-Division : UNSD, CWC Jabalpur




Stage Discharge Curve for Site Bamni (2018-19)
Stage in M
443
442.5
442
441.5
441
440.5
440
439.5
0
100
200
300
400
500
600
700
Discharge in Cumec

4.14 Burhner at Mohgaon

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Mohgaon	**Code**	:	003-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Burhner
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	3921.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°45'56''	**Longitude**	:	80°37'21''
Current Zero of Gauge (m)	:	447			

CATEGORY		Opening Date	Closing Date
Gauge	:	13/01/1977	
Discharge	:	13/01/1977	
Sediment	:	22/08/1992	
Water Quality	:		

Reduced Level	Opening Date	Closing Date
447.0	31/05/2014	31/05/2015
447.0	02/01/2018	31/12/2020
447.0	01/06/2015	01/01/2018
447.0	13/01/1977	31/05/2014
447.0	01/01/2013	30/05/2014

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	1.5	447.1	13/01/1977	0.1	446.905	30/03/1977
1977-1978	20.3	449.565	05/02/1978	0	448.76	19/05/1978
1978-1979	730.5	455.08	05/08/1978	0	448.525	25/05/1979
1979-1980	914	458.03	09/08/1979	0	448.51	01/06/1979
1980-1981	1370	457.39	16/07/1980	0	448.645	01/06/1980
1981-1982	691.8	453.33	02/07/1981	0	449.135	01/05/1982
1982-1983	2120	455.315	16/08/1982	0	449.125	01/06/1982
1983-1984	1020	455.05	08/09/1983	0	449.13	01/06/1983
1984-1985	9000	462.9	18/08/1984	0.1	449.065	01/06/1984
1985-1986	5700	461.85	08/08/1985	0.1	449.295	01/06/1985
1986-1987	3690	460.3	08/07/1986	0.1	449.195	01/06/1986
1987-1988	3022	458.58	15/09/1987	0.04	449.155	26/05/1988
1988-1989	2850	458.65	04/08/1988	0	449.12	08/06/1988
1989-1990	1085	454.1	12/09/1989	0.03	449.255	29/04/1990
1990-1991	4100	459.2	25/06/1990	0.05	449.23	30/05/1991
1991-1992	7184	463.62	23/08/1991	0.08	449.17	15/05/1992
1992-1993	3688	459.7	11/09/1992	0.01	449.38	12/05/1993
1993-1994	1900	456.21	26/09/1993	0.04	449.385	10/06/1993
1994-1995	3950	459.78	20/07/1994	0.17	449.265	05/06/1994
1995-1996	2960	458.4	09/08/1995	0.13	449.265	14/06/1995
1996-1997	902	453.96	05/08/1996	0.1	449.2	30/05/1997
1997-1998	2185	456.65	29/07/1997	0.07	449.205	16/06/1997
1998-1999	1750	456	06/07/1998	0.09	449.15	31/05/1999
1999-2000	2600	457.67	23/06/1999	0.08	449.165	09/06/1999
2000-2001	2750	457.08	27/07/2000	0.09	449.21	29/05/2001
2001-2002	2860	458.02	13/07/2001	0.07	449.21	25/05/2002
2002-2003	1725	455.95	18/08/2002	0.01	449.095	25/05/2003
2003-2004	6469	462.82	29/08/2003	0.01	449.04	11/06/2003
2004-2005	11600	467.3	08/08/2004	0.1	449.21	08/06/2004
2005-2006	5400.36	461.6	06/08/2005	0.09	449.4	03/06/2005
2006-2007	6723	462.34	31/07/2006	0.11	449.25	16/05/2007
2007-2008	1084.79	454.5	08/07/2007	0.04	449.16	21/05/2008

2008-2009	939.79	454.08	01/08/2008	0.13	449.095	09/05/2009
2009-2010	364.07	451.92	21/07/2009	0	449.185	25/05/2010
2010-2011	2890.09	456.85	02/09/2010	0	449.175	01/06/2010
2011-2012	1863.79	456.39	07/09/2011	0.03	449.17	08/06/2011
2012-2013	1180	454.05	09/07/2012	0	449.13	04/06/2012
2013-2014	1508.76	454.93	22/08/2013	0.2	449.195	02/06/2013
2014-2015	2149.16	457.35	06/08/2014	0.24	449.23	01/06/2014
2015-2016	1805.08	455.175	04/08/2015	0.09	449.1	24/05/2016
2016-2017	1551.26	455.05	07/08/2016	0	449.04	22/05/2017
2017-2018	1424.6	456.25	16/07/2017	0.02	449.09	31/05/2018
2018-2019	1626	455.11	23/07/2018	0	449.13	17/05/2019

Stage Discharge Sheet for Burhner at Mohgaon for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.02	449.09	34	449.91	78.06	450.41	207	451.26
2	0.02	449.09	55.6	450.2	76.08	450.34	200	451.19
3	0.02	449.09	123.6	450.74	89.24	450.55	188.2	451.09
4	0.01	449.08	31.93	449.96	53.97	450.24	177.5	451
5	0.02	449.08	32.5	449.96	44	450.13	123.7	450.76
6	0.04	449.1	43.04	450.12	37.94	450.06	131.6	450.8
7	0.04	449.1	26.52	449.89	35.44	450.03	412.2	452.16
8	0.02	449.09	107	450.64	80.29	450.43	636.5	452.9
9	58.5	450.23	58.64	450.25	624.1	452.9	270	451.62
10	36	450.03	122.9	450.72	204.6	451.21	199.1	451.19
11	77.96	450.34	104.9	450.61	206.9	451.25	161.2	450.98
12	22.53	449.77	111.6	450.64	260	451.45	127	450.79
13	17.5	449.69	186.4	451.08	297.9	451.88	120	450.7
14	23.48	449.79	166.6	450.97	197.9	451.12	86.03	450.52
15	56.59	450.22	250.04	451.35	180	451.07	74.97	450.43
16	19	449.74	961.8	453.5	265.1	451.49	70	450.37
17	10	449.55	493.2	452.44	225.6	451.37	60.11	450.29
18	5.08	449.44	211.2	451.32	171.8	450.97	52.92	450.22
19	6.48	449.5	160.5	450.96	290	451.18	48.62	450.17
20	5.03	449.43	430.9	452.14	560	452.64	44.72	450.13
21	4.94	449.42	278.7	451.66	257	451.4	40	450.09
22	4.8	449.41	250	451.35	205	451.26	58.77	450.27
23	12.15	449.6	1626	455.11	175.3	450.98	65	450.32
24	8	449.52	706.4	453.13	130.7	450.79	71.94	450.41
25	45.73	450.15	276.2	451.64	123.4	450.73	48.83	450.2
26	20.53	449.75	256.3	451.42	123	450.73	45.67	450.15
27	12.3	449.6	523.8	452.58	182	451.04	41.05	450.07
28	21.83	449.76	253.2	451.42	183.8	451.04	33.52	450.01
29	77.08	450.33	190	451.1	544.6	452.58	29.28	449.95
30	37.56	450.03	124.6	450.76	384.9	452.06	28	449.91
31			92.47	450.52	251.5	451.4		
Ten-Daily Mean								
I Ten-Daily	9.47	449.3	63.57	450.24	132.37	450.63	254.58	451.4
II Ten-Daily	24.36	449.75	307.71	451.5	265.52	451.44	84.56	450.46
III Ten-Daily	24.49	449.76	416.15	451.88	232.84	451.27	46.21	450.14
Monthly								
Min.	0.01	449.08	26.52	449.89	35.44	450.03	28	449.91
Max.	77.96	450.34	1626	455.11	624.1	452.9	636.5	452.9
Mean	19.44	449.6	262.48	451.21	210.24	451.12	128.45	450.67

Annual Runoff in MCM : 1766.92 **Annual Runoff in mm : 450.63**

Peak Observed Discharge = 1626 cumecs on 23/7/2018 Corres. Water Level 455.11 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Burhner at Mohgaon for the period 2018-19

Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	26.69	449.88	8.27	449.53	4.96	449.45	4.53	449.44
2	25.5	449.82	7.85	449.52	4.9	449.45	4.35	449.43
3	24.69	449.79	7.45	449.51	4.85	449.45	4.26	449.43
4	23.12	449.77	7.4	449.51	4.7	449.44	4.21	449.43
5	22.61	449.75	7.4	449.51	4.53	449.44	4	449.42
6	22.08	449.74	7	449.51	4.41	449.43	4	449.42
7	21	449.73	7	449.5	4.4	449.43	4.09	449.42
8	19.96	449.72	7	449.5	4.25	449.42	3.95	449.41
9	20.61	449.73	6.6	449.49	4.25	449.42	3.9	449.41
10	19.7	449.71	6.6	449.49	4.15	449.41	3.87	449.41
11	18.98	449.69	6.6	449.49	4.15	449.41	3.8	449.41
12	18.05	449.67	6.6	449.49	4	449.4	3.8	449.41
13	16.38	449.66	6.2	449.48	4.68	449.45	3.8	449.41
14	16	449.65	6.16	449.48	4.56	449.45	3.78	449.4
15	15.76	449.65	6.08	449.48	7	449.5	3.7	449.4
16	15.05	449.64	6.04	449.48	7	449.5	3.53	449.4
17	14.52	449.63	5.97	449.48	6.67	449.49	3.37	449.39
18	14.2	449.62	5.9	449.48	6.14	449.47	3.33	449.39
19	14.15	449.62	5.89	449.47	6.3	449.48	3.3	449.39
20	14.14	449.62	5.78	449.47	8	449.52	3.3	449.39
21	14	449.61	5.7	449.47	7	449.5	3.06	449.38
22	13.68	449.61	5.64	449.47	6.3	449.48	2.98	449.38
23	13.04	449.6	5.6	449.47	6.3	449.48	2.95	449.38
24	12.45	449.59	5.6	449.47	6.3	449.48	2.7	449.37
25	12.07	449.58	5.6	449.47	5.7	449.47	2.7	449.37
26	11.66	449.57	5.55	449.46	5.7	449.47	2.95	449.38
27	10.84	449.55	5.46	449.46	5.4	449.46	3.6	449.4
28	10.3	449.53	5.4	449.46	5.4	449.46	3.8	449.41
29	9.63	449.5	5.36	449.46	4.9	449.45	6.3	449.48
30	9.39	449.49	5.23	449.46	4.9	449.45	7.4	449.51
31	8.98	449.49			4.84	449.44	7.45	449.51
Ten-Daily Mean								
I Ten-Daily	22.6	449.76	7.26	449.51	4.54	449.43	4.12	449.42
II Ten-Daily	15.72	449.65	6.12	449.48	5.85	449.47	3.57	449.4
III Ten-Daily	11.46	449.56	5.51	449.46	5.7	449.47	4.17	449.42
Monthly								
Min.	8.98	449.49	5.23	449.46	4	449.4	2.7	449.37
Max.	26.69	449.88	8.27	449.53	8	449.52	7.45	449.51
Mean	16.59	449.66	6.3	449.48	5.36	449.46	3.95	449.41

Peak Computed Discharge = 290 cumecs on 19/8/2018 Corres. Water Level 451.18 m
Lowest Computed Discharge = 0cumecs on 17/5/2019 Corres. Water Level 449.13 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Burhner at Mohgaon for the period 2018-19

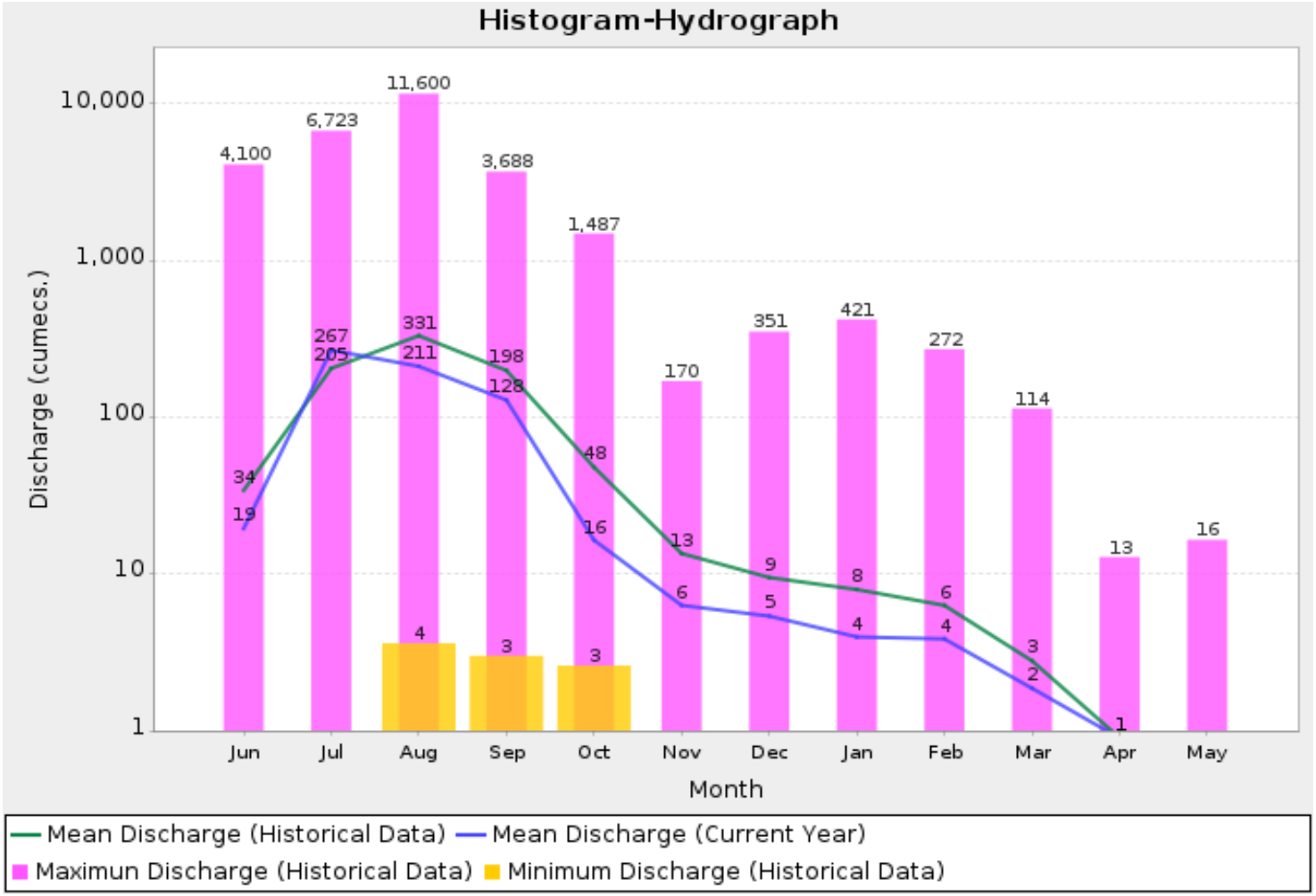
Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.72	449.49	2.47	449.44	1.68	449.4	0.3	449.22
2	6.3	449.48	2.4	449.44	1.57	449.39	0.3	449.22
3	5.7	449.47	2.4	449.44	1.6	449.39	0.3	449.22
4	5.7	449.47	2.4	449.44	1.5	449.38	0.27	449.21
5	4.9	449.45	2.43	449.44	1.48	449.38	0.27	449.21
6	4.6	449.44	2.22	449.43	1.4	449.37	0.24	449.2
7	4	449.42	2.03	449.42	1.25	449.36	0.24	449.2
8	6.3	449.48	1.71	449.42	1.08	449.35	0.22	449.19
9	5.7	449.47	1.6	449.39	1.02	449.34	0.22	449.19
10	4.6	449.44	1.5	449.38	0.97	449.33	0.2	449.18
11	3.3	449.39	1.43	449.37	0.9	449.32	0.18	449.17
12	2.4	449.36	1.33	449.36	0.86	449.31	0.18	449.17
13	2.1	449.35	1.24	449.35	0.85	449.31	0.16	449.16
14	2.1	449.35	1.22	449.35	0.8	449.3	0.15	449.15
15	2.7	449.37	1.18	449.34	0.8	449.3	0.08	449.14
16	2.7	449.37	1.7	449.4	0.75	449.29	0.05	449.13
17	2.7	449.37	1.6	449.39	0.75	449.28	0	449.13
18	2.4	449.36	1.5	449.38	0.75	449.28	0	449.13
19	2.4	449.36	1.5	449.38	0.7	449.27	0	449.13
20	2.4	449.36	1.5	449.38	0.7	449.27	0	449.15
21	2.1	449.35	1.4	449.37	0.7	449.27	0	449.15
22	4.9	449.45	1.4	449.37	0.63	449.26	0	449.15
23	4.6	449.44	1.4	449.37	0.61	449.26	0	449.15
24	4.2	449.43	1.5	449.38	0.61	449.26	0	449.15
25	3.74	449.4	3.5	449.5	0.57	449.25	0	449.14
26	3.01	449.38	3	449.46	0.54	449.25	0	449.14
27	2.76	449.46	2.4	449.44	0.48	449.24	0	449.14
28	2.62	449.45	2.2	449.43	0.48	449.24	0	449.14
29			2	449.42	0.4	449.23	0	449.13
30			1.85	449.41	0.4	449.23	0	449.13
31			1.7	449.4			0	449.13
Ten-Daily Mean								
I Ten-Daily	5.45	449.46	2.12	449.42	1.36	449.37	0.26	449.2
II Ten-Daily	2.52	449.36	1.42	449.37	0.79	449.29	0.08	449.15
III Ten-Daily	3.49	449.42	2.03	449.41	0.54	449.25	0	449.14
Monthly								
Min.	2.1	449.35	1.18	449.34	0.4	449.23	0	449.13
Max.	6.72	449.49	3.5	449.5	1.68	449.4	0.3	449.22
Mean	3.82	449.42	1.86	449.4	0.89	449.3	0.11	449.16

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1977-2019)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

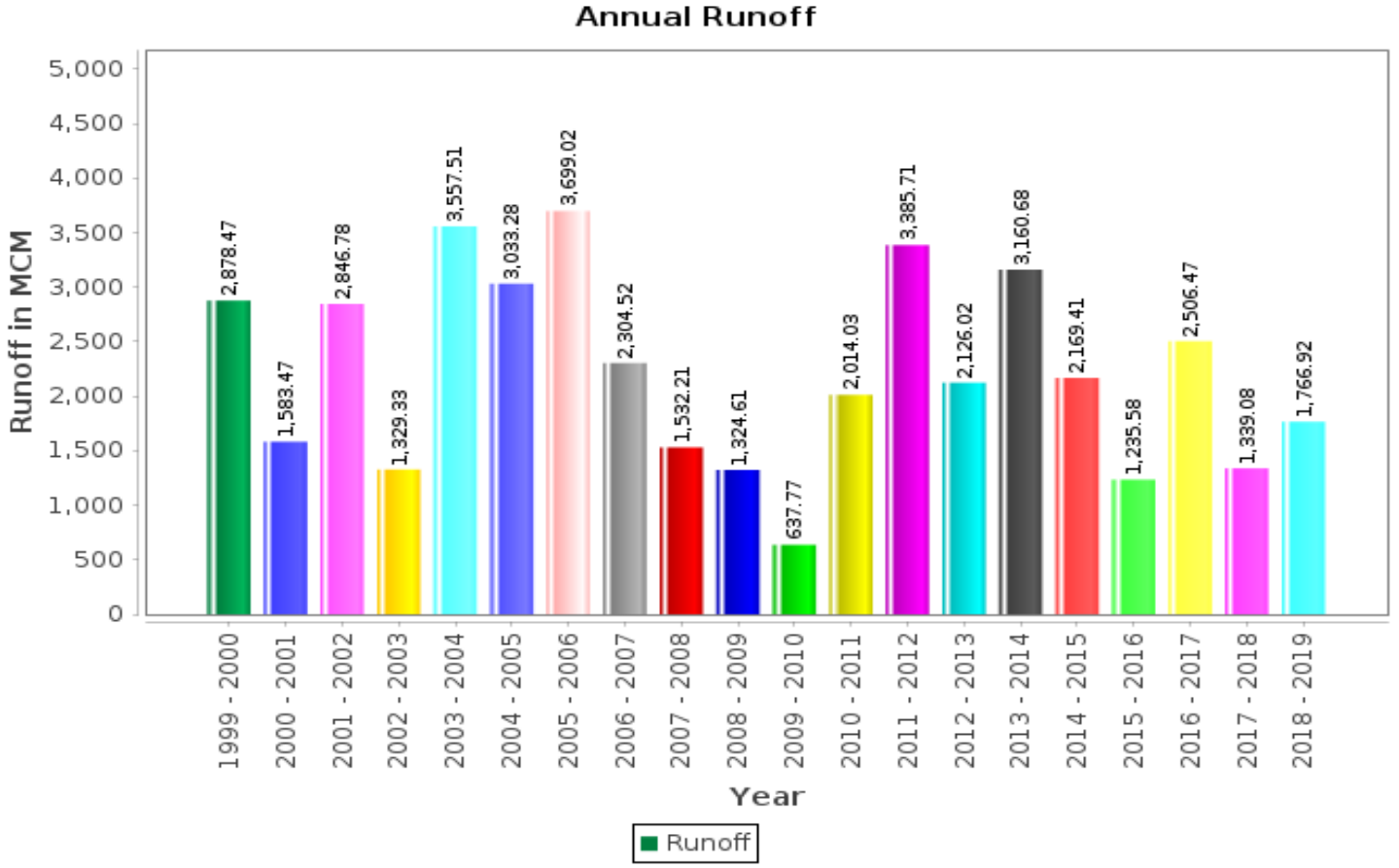
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Annual Runoff Values for the period (1977– 2019)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

Local River : Burhner Sub-Division : UNSD, CWC Jabalpur

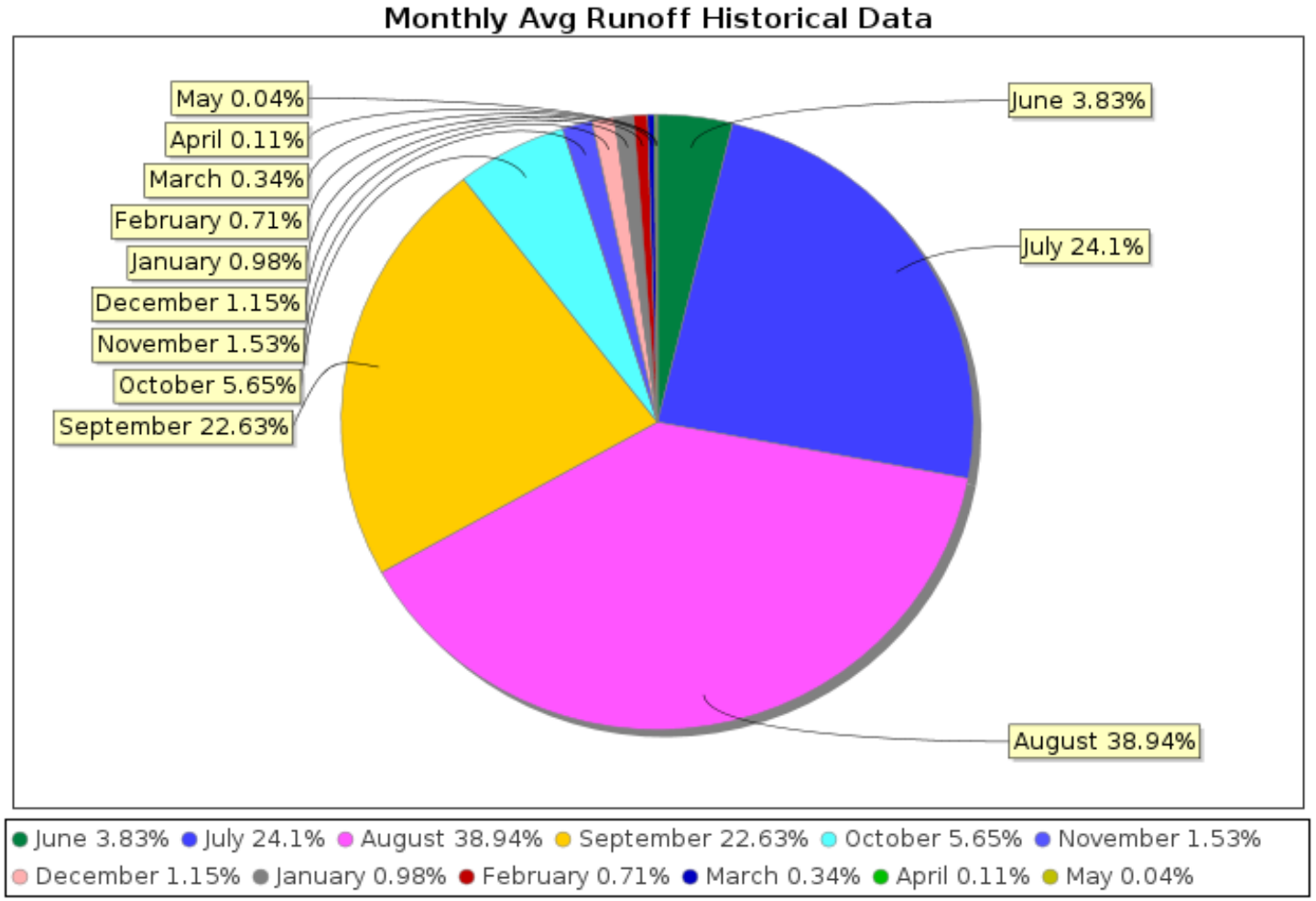


Note: Missing values have not been considered while arriving at Annual Runoff

Monthly Average Runoff based on period (1977– 2019)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



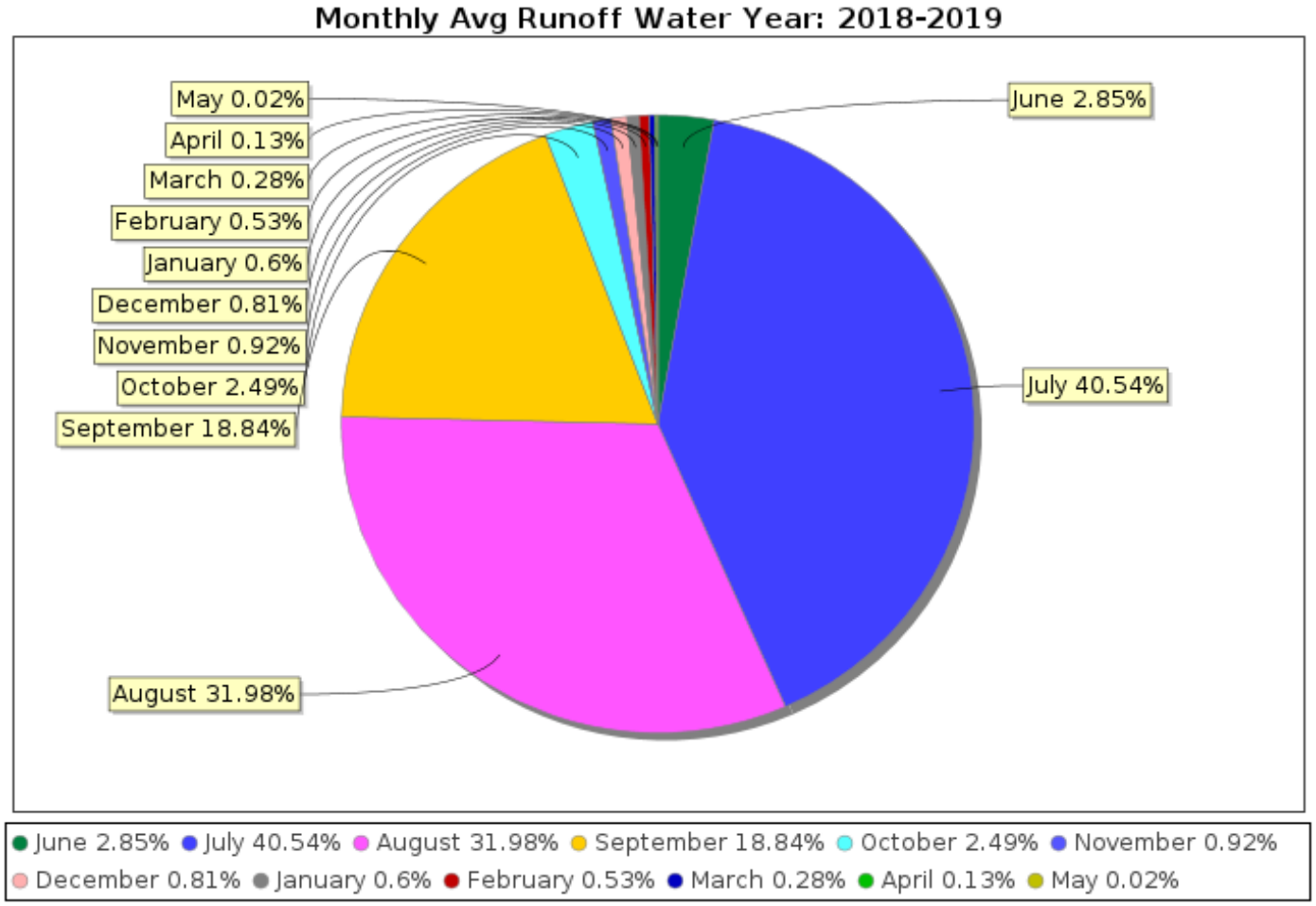
Monthly Runoff for the Year (2018-19)

Station Name : Burhner at Mohgaon (010215004)

Division : Narmada Division, Bhopal

Local River : Burhner

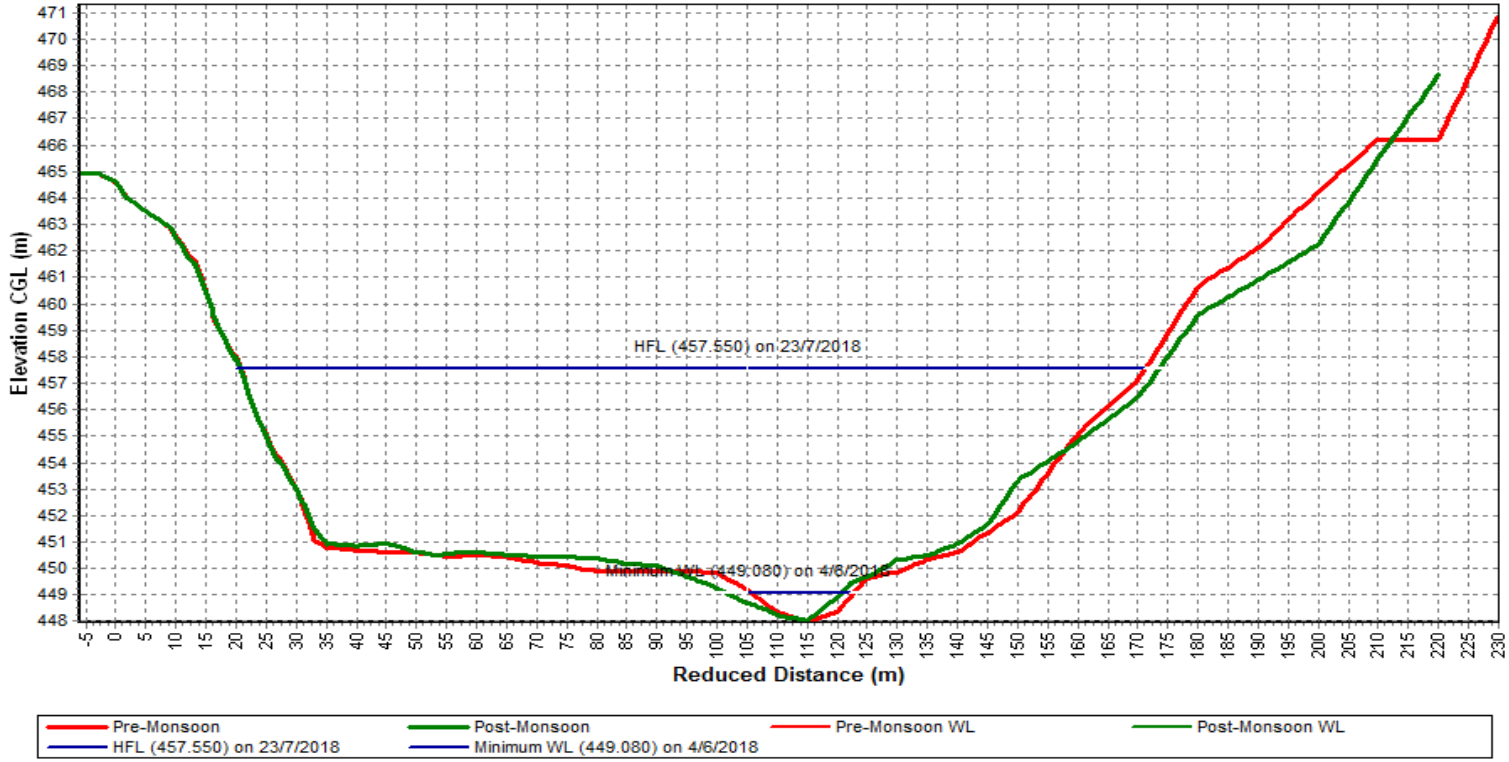
Sub-Division : UNSD, CWC Jabalpur



Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

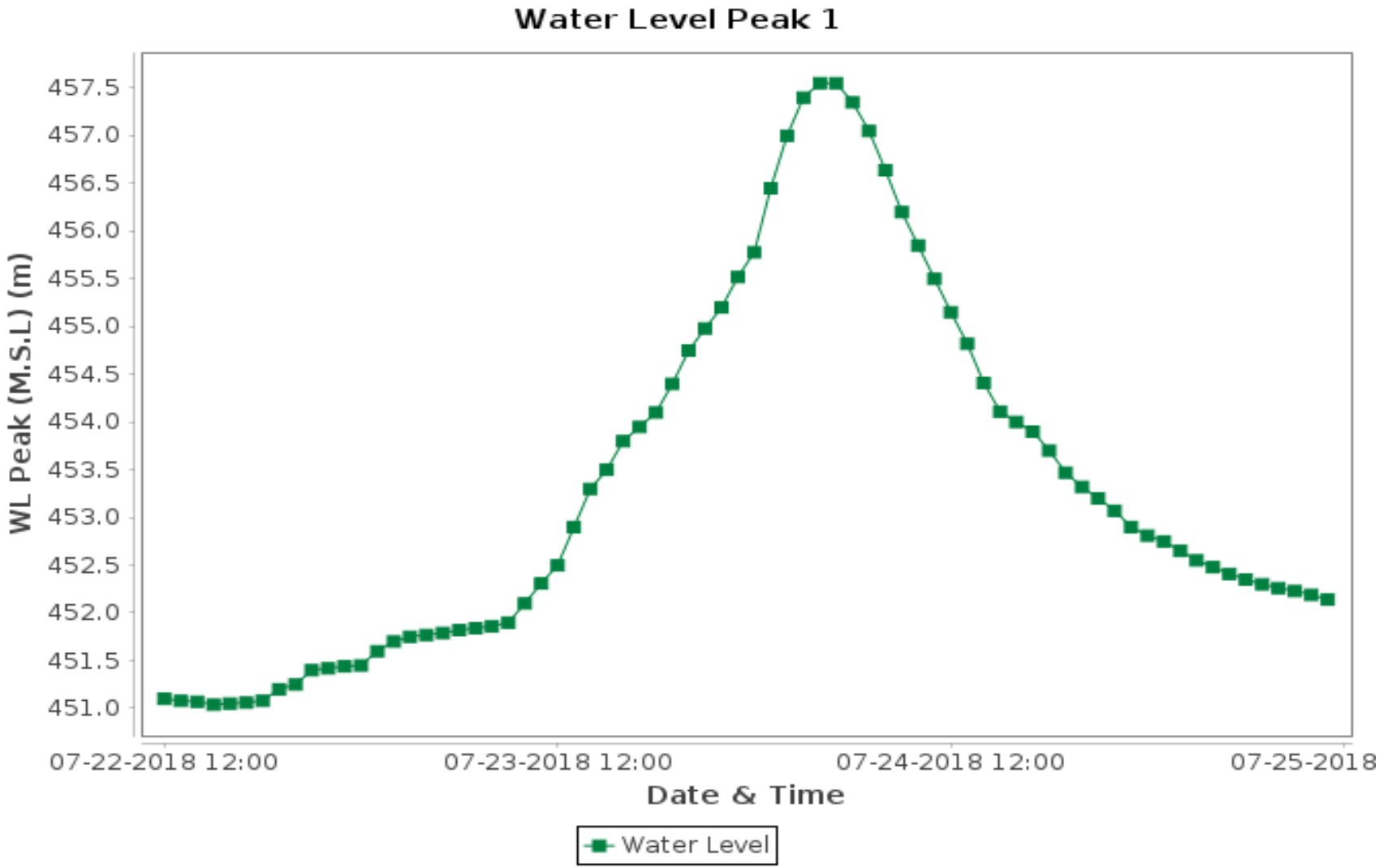
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

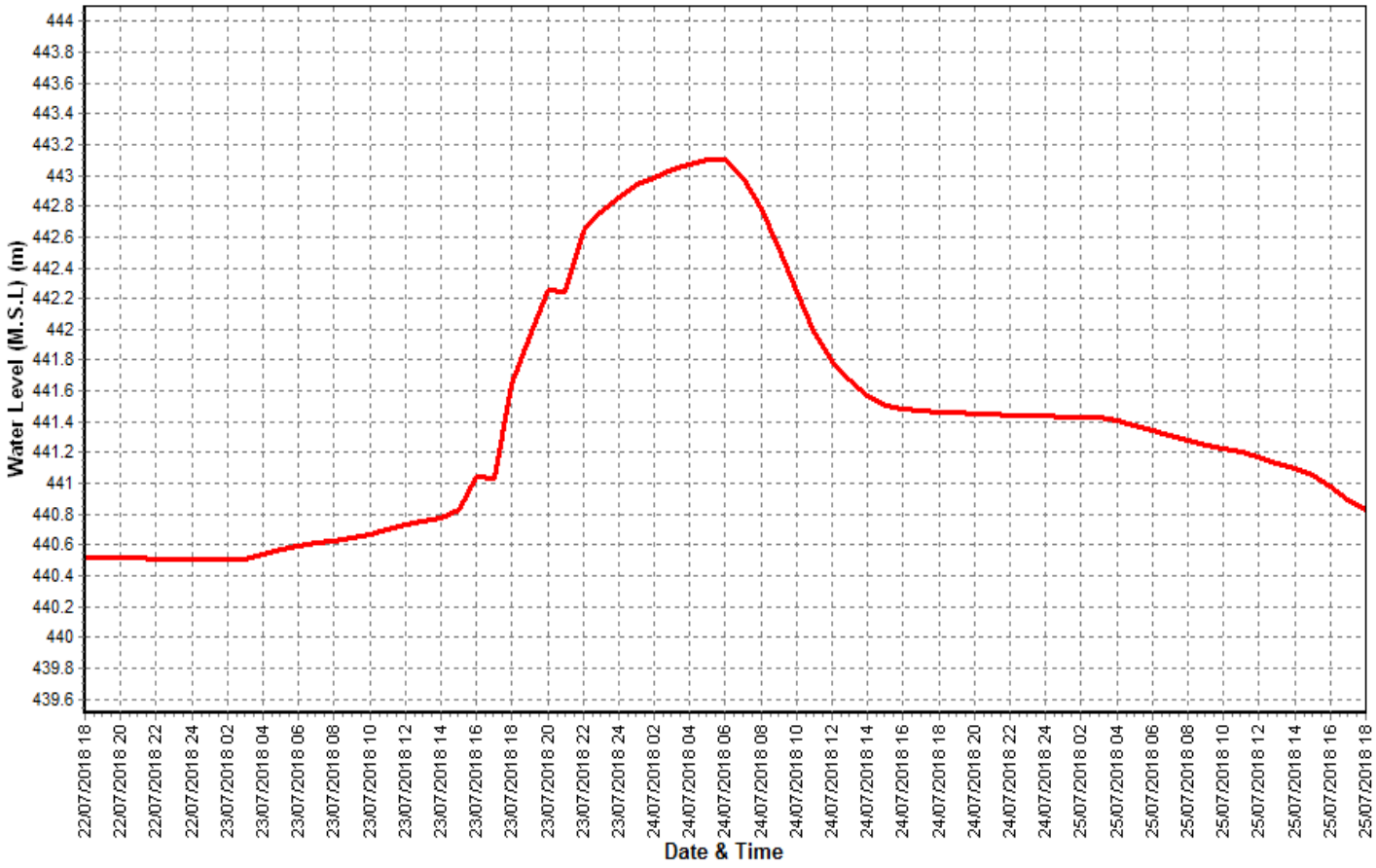
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

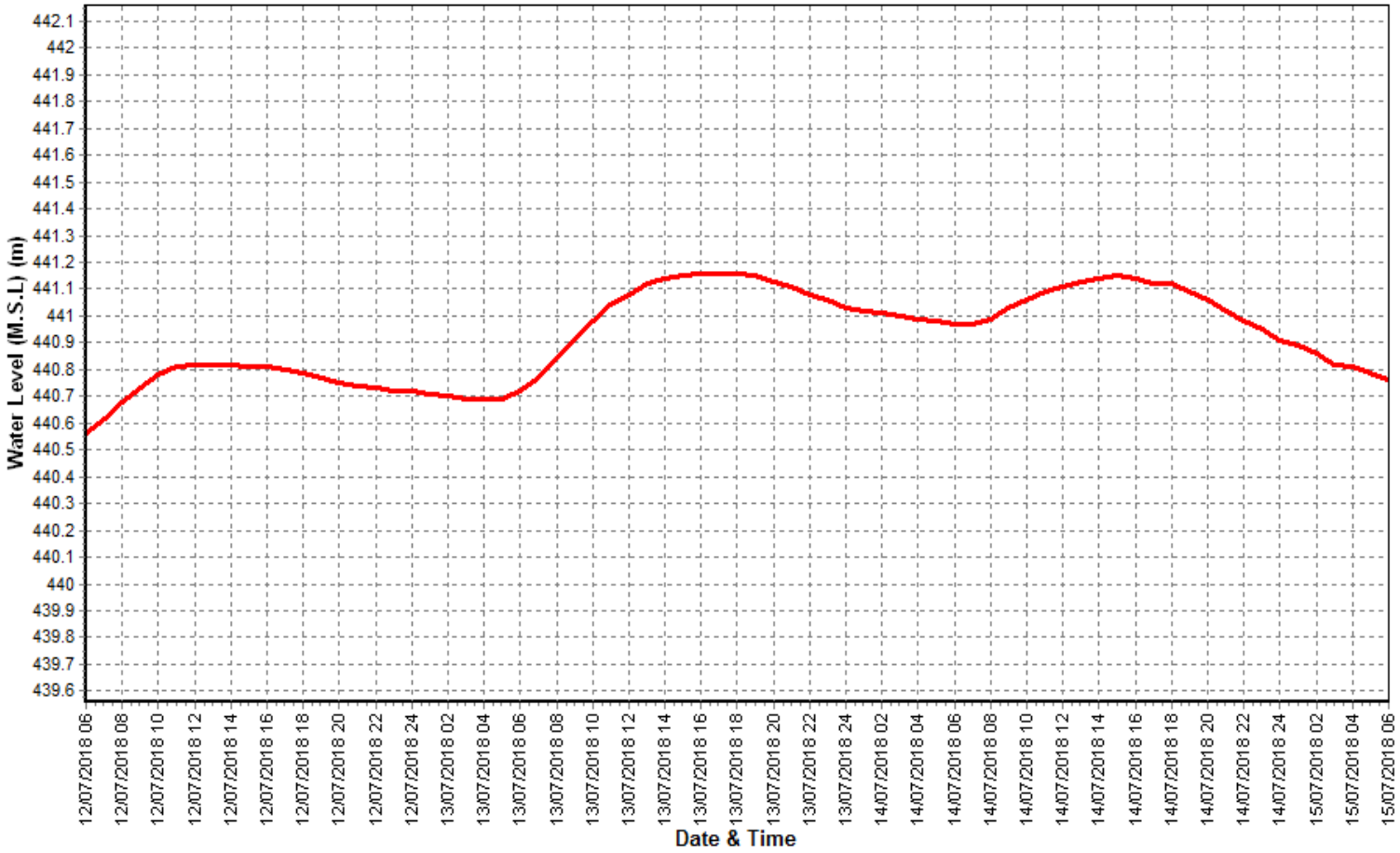
Local River : Burhner Sub-Division : UNSD, CWC Jabalpur

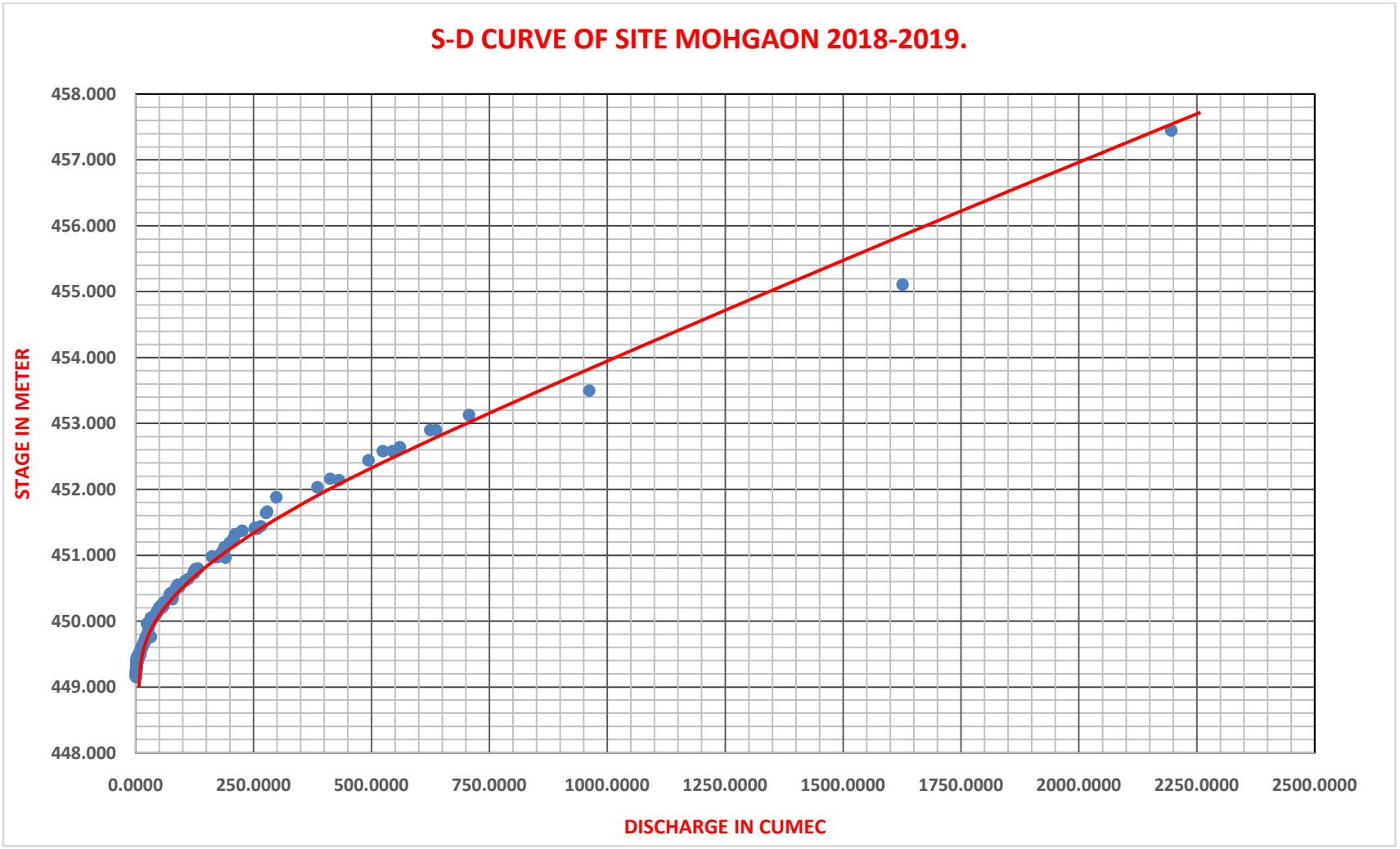


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Burhner at Mohgaon (010215004) Division : Narmada Division, Bhopal

Local River : Burhner Sub-Division : UNSD, CWC Jabalpur




S-D CURVE OF SITE MOHGAON 2018-2019.
458.000
457.000
456.000
455.000
454.000
453.000
452.000
451.000
450.000
449.000
448.000
STAGE IN METER
0.0000
250.0000
500.0000
750.0000
1000.0000
1250.0000
1500.0000
1750.0000
2000.0000
2250.0000
2500.0000
DISCHARGE IN CUMEC

4.15 Narmada at Manot

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Manot	**Code**	:	009-ndbhp
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	4667.0 Sq. Km.	**Bank**	:	Right
Latitude	:	22°44'8''	**Longitude**	:	80°30'43''
Current Zero of Gauge (m)	:	442			

CATEGORY		Opening Date	Closing Date
Gauge	:	16/12/1976	
Discharge	:	16/12/1976	
Sediment	:	09/11/1979	31/12/2050
Water Quality	:		

Reduced Level	Opening Date	Closing Date
442.0	01/01/2013	03/08/2015
442.0	04/08/2015	31/05/2050
442.0	16/12/1976	04/08/2015
442.0	16/06/1976	16/12/1976

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1976-1977	13	442.06	13/05/1977	0.5	442.79	07/05/1977
1977-1978	2125	452.5	07/08/1977	0.2	442.795	03/06/1977
1978-1979	960	446.025	06/08/1978	0.4	442.68	09/05/1979
1979-1980	2380	450.69	09/08/1979	0	442.365	29/05/1980
1980-1981	3277.1	452.115	09/09/1980	0	442.725	13/06/1980
1981-1982	1687.7	447.61	28/07/1981	0.1	442.745	15/06/1981
1982-1983	1242	448.675	16/08/1982	0.1	442.77	27/05/1983
1983-1984	2423	452.7	08/09/1983	0.1	442.79	15/06/1983
1984-1985	5660	459.65	18/08/1984	0.2	442.8	04/06/1984
1985-1986	4850	455.4	08/08/1985	0.2	443	11/06/1985
1986-1987	5762	458	08/07/1986	0.2	442.86	10/06/1986
1987-1988	6180	457.475	15/09/1987	0.25	442.755	31/05/1988
1988-1989	4130	454.1	04/08/1988	0.19	442.76	17/06/1988
1989-1990	950	446.3	14/08/1989	0.15	442.67	11/06/1989
1990-1991	2300	451.88	25/06/1990	0.6	442.9	31/05/1991
1991-1992	6520	459.3	23/08/1991	0.26	442.995	07/06/1991
1992-1993	3340	453.2	11/09/1992	0.04	442.975	30/05/1993
1993-1994	2980	452.2	17/08/1993	0.02	442.95	13/06/1993
1994-1995	4410	455.55	21/07/1994	0.2	443.2	14/06/1994
1995-1996	3300	453.15	09/08/1995	0.4	443.015	16/06/1995
1996-1997	1650	448.94	27/07/1996	0.34	442.975	04/06/1996
1997-1998	3160	451.6	01/08/1997	0.42	442.975	15/06/1997
1998-1999	2010	449.92	06/07/1998	0.88	443.045	21/05/1999
1999-2000	4390	452.5	18/09/1999	0.84	443.08	08/05/2000
2000-2001	3000	451.62	20/07/2000	0.6	443.02	24/05/2001
2001-2002	3600	452.25	13/07/2001	0.3	442.93	21/05/2002
2002-2003	1940	449.4	09/09/2002	0.1	442.77	29/05/2003
2003-2004	4980	455.9	29/08/2003	0.02	442.49	15/06/2003
2004-2005	5760	458.8	08/08/2004	0.6	442.87	29/05/2005
2005-2006	4485.86	454.775	06/08/2005	0.01	442.85	12/06/2005
2006-2007	6806.05	453.31	31/07/2006	0.09	442.84	31/05/2007
2007-2008	970.67	446.805	06/09/2007	0.01	442.83	02/06/2007
2008-2009	1392.6	447.6	11/08/2008	0.05	442.8	06/06/2008

2009-2010	1068.8	446.85	09/09/2009	0	442.55	30/05/2010
2010-2011	2435.44	449.4	26/07/2010	0	442.515	16/06/2010
2011-2012	2439.3	451.83	07/09/2011	0	443.035	29/04/2012
2012-2013	1311.72	448.5	11/08/2012	0.29	442.87	14/06/2012
2013-2014	1572.52	449.2	09/08/2013	0.52	442.855	25/05/2014
2014-2015	3474.62	453.19	06/08/2014	0.27	442.78	15/06/2014
2015-2016	1178.44	448.99	04/08/2015	0.01	442.61	27/05/2016
2016-2017	950	448.05	07/08/2016	0	442.66	29/05/2017
2017-2018	316.9	446.05	09/08/2017	0	442.63	17/06/2017
2018-2019	676.9	448.74	08/09/2018	0.15	442.65	11/05/2019

Stage Discharge Sheet for Narmada at Manot for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	6.72	442.9	14.5	443.34	189.6	444.4	305.7	445.61
2	6.22	442.86	19.65	443.58	185.5	444.36	235	445.13
3	5.45	442.82	159.3	444.72	203.8	444.72	218.3	444.88
4	4.07	442.77	99.4	444.2	195.5	444.42	200.7	444.71
5	3.66	442.75	61.49	443.94	185	444.26	186.1	444.55
6	3.24	442.73	58.53	443.85	172.6	444.03	180.4	444.5
7	3.2	442.73	53.85	443.77	166.7	443.98	296.8	445.51
8	3.05	442.72	35.5	443.63	177.8	444.3	676.9	448.74
9	4.58	442.79	75.38	444.09	319	445.86	320	445.88
10	13.3	443.26	33	443.79	196.6	444.69	259.8	445.13
11	12.68	443.23	44.8	443.93	209.6	444.83	210.8	444.83
12	15.39	443.4	54.01	444.11	205	444.94	196.5	444.67
13	16.03	443.42	280	445.51	323.8	445.93	188	444.59
14	14.68	443.34	164.7	444.84	215.3	444.85	173	444.43
15	11.92	443.18	240	445.24	212	444.8	164.5	444.34
16	10.4	443.12	247.4	445.34	309.6	445.73	150	444.22
17	10.1	443.08	223.9	445.04	287.4	445.46	148.1	444.19
18	10.55	443.14	243.3	445.19	208	444.78	136.1	444.1
19	9.07	443.07	229.2	445.14	205	444.83	129.9	444.05
20	7.99	443.02	202.6	444.62	287.9	445.46	128.2	444.04
21	7.47	442.98	189.7	444.4	284.4	445.41	119.5	443.98
22	7.15	442.95	150	444.31	240	445.14	120.4	443.99
23	9.55	443.09	401.5	446.74	203.5	444.74	135	444.1
24	8.95	443.05	358	446.5	189.4	444.59	140.2	444.14
25	9.1	443.06	165.9	444.85	188.1	444.57	133.3	444.08
26	8.5	443.01	162.3	444.78	184.6	444.54	117	443.97
27	17.02	443.48	312.3	445.61	184.6	444.54	111.9	443.94
28	14.47	443.37	251.3	445.12	192	444.59	100.7	443.87
29	19.26	443.56	202.8	443.63	296	445.5	91.92	443.83
30	17.21	443.48	197.3	444.47	482.7	447.2	85.5	443.79
31			182.1	444.35	261.5	445.15		
Ten-Daily Mean								
I Ten-Daily	5.35	442.83	61.06	443.89	199.21	444.5	287.97	445.46
II Ten-Daily	11.88	443.2	192.99	444.9	246.36	445.16	162.51	444.35
III Ten-Daily	11.87	443.2	233.93	444.98	246.07	445.09	115.54	443.97
Monthly								
Min.	3.05	442.72	14.5	443.34	166.7	443.98	85.5	443.79
Max.	19.26	443.56	401.5	446.74	482.7	447.2	676.9	448.74
Mean	9.7	443.08	162.66	444.59	230.55	444.92	188.67	444.59

Annual Runoff in MCM : 1773.49 **Annual Runoff in mm : 380.01**

Peak Observed Discharge = 676.9 cumecs on 8/9/2018 Corres. Water Level 448.74 m

Lowest Observed Discharge = 3.05cumecs on 8/6/2018 Corres. Water Level 442.72 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Manot for the period 2018-19

Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	79.56	443.75	11.39	443.36	10.35	443.19	10.92	443.26
2	60	443.72	11.36	443.36	10.25	443.18	10.92	443.26
3	45.21	443.67	11.24	443.35	9.33	443.17	10.63	443.25
4	41.86	443.65	11.15	443.34	9.3	443.17	10.47	443.25
5	38.9	443.64	11.05	443.33	9.02	443.16	10.18	443.24
6	33.84	443.62	11	443.32	8.93	443.16	10.15	443.24
7	30	443.6	10.95	443.31	8.81	443.16	9.88	443.23
8	33.35	443.62	10.9	443.3	8.8	443.15	9.79	443.23
9	27.96	443.6	10.9	443.3	8.75	443.15	9.36	443.22
10	23.3	443.58	10.85	443.29	8.58	443.14	9.24	443.22
11	20.35	443.55	10.85	443.29	8.4	443.14	9.14	443.22
12	18.63	443.53	10.8	443.28	10.24	443.22	9.14	443.22
13	19.93	443.55	10.8	443.28	10.16	443.22	9.14	443.22
14	18.5	443.53	10.8	443.28	10.16	443.22	9	443.21
15	17.82	443.52	10.75	443.27	10.16	443.22	8.75	443.21
16	16.94	443.51	10.75	443.27	10.8	443.22	8.64	443.21
17	16.13	443.5	10.7	443.27	11	443.24	8.58	443.21
18	15.37	443.49	10.7	443.26	11.3	443.26	8.54	443.21
19	14.6	443.48	10.65	443.25	11.4	443.27	8.47	443.21
20	13.8	443.47	10.65	443.25	11.33	443.27	8.35	443.2
21	13.4	443.46	10.6	443.24	11.02	443.27	8.23	443.2
22	12.97	443.45	10.6	443.24	10.94	443.26	8.16	443.2
23	12.64	443.44	10.55	443.23	11.1	443.26	8.06	443.19
24	12.59	443.44	10.5	443.22	11.46	443.27	7.9	443.19
25	12.39	443.43	10.5	443.22	11.46	443.28	7.81	443.19
26	12.24	443.42	10.45	443.21	11.46	443.28	9.13	443.2
27	12.06	443.41	10.45	443.21	11.46	443.28	9.2	443.21
28	11.95	443.4	10.4	443.2	11.2	443.27	9.3	443.22
29	11.8	443.39	10.4	443.2	11.13	443.27	9.89	443.43
30	11.65	443.38	10.35	443.19	11.13	443.27	10.07	443.24
31	11.49	443.37			10.95	443.27	10.02	443.24
Ten-Daily Mean								
I Ten-Daily	41.4	443.65	11.08	443.33	9.21	443.16	10.15	443.24
II Ten-Daily	17.21	443.51	10.75	443.27	10.5	443.23	8.78	443.21
III Ten-Daily	12.29	443.42	10.48	443.22	11.21	443.27	8.89	443.23
Monthly								
Min.	11.49	443.37	10.35	443.19	8.4	443.14	7.81	443.19
Max.	79.56	443.75	11.39	443.36	11.46	443.28	10.92	443.43
Mean	23.63	443.53	10.77	443.27	10.31	443.22	9.27	443.23

Peak Computed Discharge = 320 cumecs on 9/9/2018 Corres. Water Level 445.88 m
Lowest Computed Discharge = 0.15cumecs on 11/5/2019 Corres. Water Level 442.65 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Manot for the period 2018-19

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	9.95	443.24	8.13	443.06	7.02	443.02	2.8	442.7
2	11.02	443.26	7.81	443.05	6.57	443	2.4	442.69
3	11	443.26	7.8	443.05	6.18	442.98	2.2	442.69
4	11.1	443.26	7.6	443.04	5.88	442.96	2.2	442.69
5	11.1	443.27	7.42	443.03	5.83	442.96	1.7	442.68
6	11	443.26	7.4	443.03	5.59	442.95	1.5	442.68
7	10.9	443.25	6.87	443.02	5.59	442.95	1.1	442.67
8	10.75	443.24	6.79	443.02	5.34	442.94	0.9	442.67
9	10.75	443.24	6.78	443.02	5.3	442.94	0.5	442.66
10	10.6	443.23	6.35	443.01	4.96	442.93	0.5	442.66
11	10.6	443.23	6.17	443	4.74	442.92	0.15	442.65
12	10.4	443.22	6.12	443	4.54	442.91	0.15	442.65
13	10.4	443.22	5.9	442.99	4.54	442.91		
14	10.2	443.21	5.78	442.99	4.3	442.9		
15	10.2	443.21	5.52	442.98	4.03	442.89		
16	10	443.21	5.46	442.98	3.77	442.88		
17	10	443.2	5.8	442.99	3.76	442.9		
18	9.3	443.19	6.14	443	3.76	442.89		
19	9.28	443.19	6.76	443.02	3.65	442.88		
20	9.2	443.19	7.32	443.03	3.53	442.87		
21	9.2	443.18	7.32	443.03	3.52	442.86		
22	9.66	443.21	7.42	443.04	3.5	442.85		
23	9.65	443.21	7.42	443.04	3.48	442.84		
24	9.5	443.2	7.55	443.05	3.45	442.82		
25	9.3	443.19	7.7	443.06	3.42	442.8		
26	9.11	443.18	8.12	443.07	3.41	442.79		
27	8.93	443.17	7.84	443.06	3.4	442.78		
28	8.16	443.06	7.7	443.05	3.38	442.77		
29			7.51	443.04	3.35	442.74		
30			7.26	443.03	3.28	442.71		
31			7.25	443.03				
Ten-Daily Mean								
I Ten-Daily	10.82	443.25	7.3	443.03	5.83	442.96	1.58	442.68
II Ten-Daily	9.96	443.21	6.1	443	4.06	442.9	0.03	88.53
III Ten-Daily	9.19	443.17	7.55	443.05	3.42	442.8	0	0
Monthly								
Min.	8.16	443.06	5.46	442.98	3.28	442.71	0.15	442.65
Max.	11.1	443.27	8.13	443.07	7.02	443.02	2.8	442.7
Mean	9.99	443.21	6.98	443.03	4.44	442.88	0.54	177.07

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

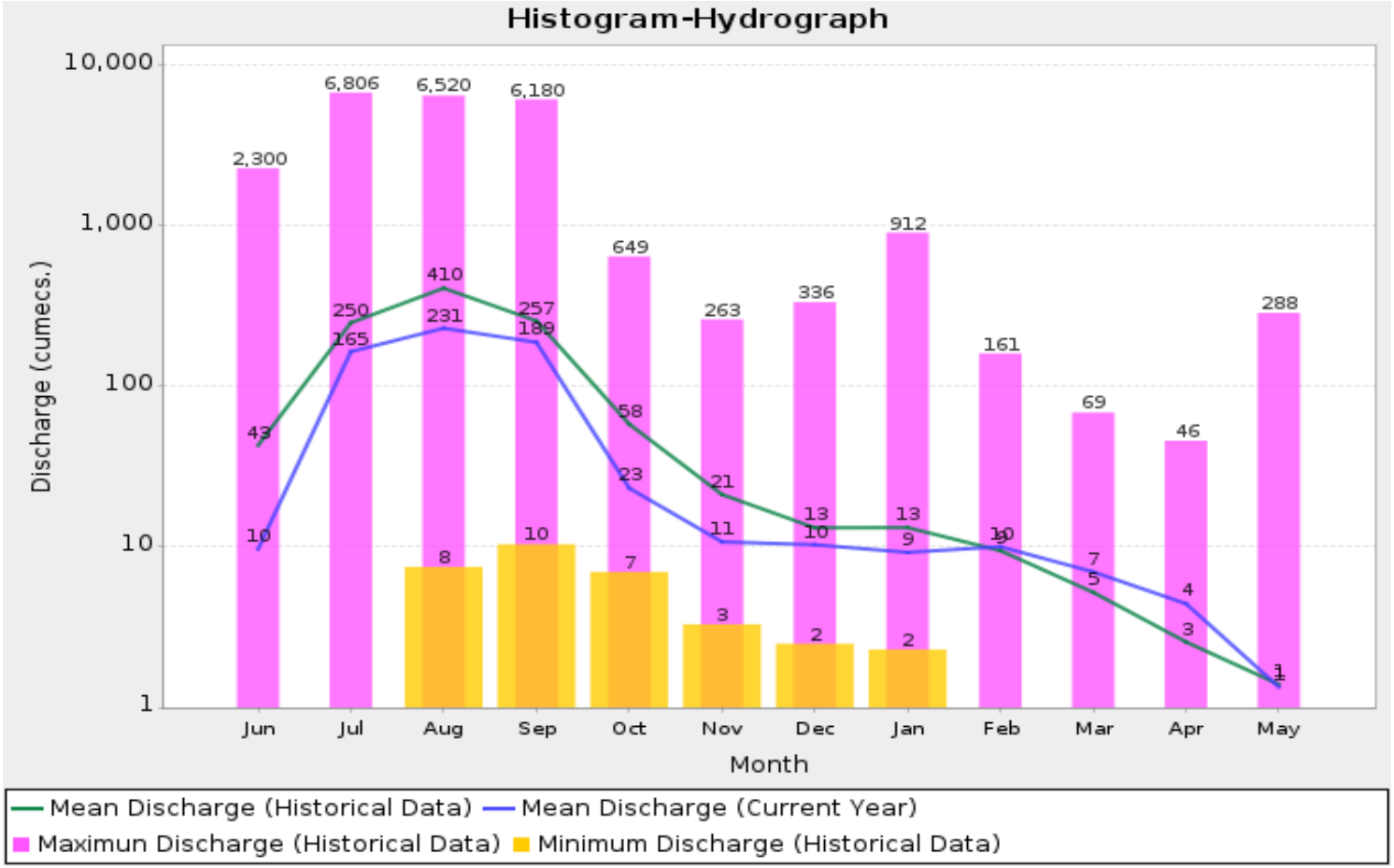
Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1977-2018)

Station Name : Narmada at Manot (010215002)

Division : Narmada Division, Bhopal

Local River : Narmada

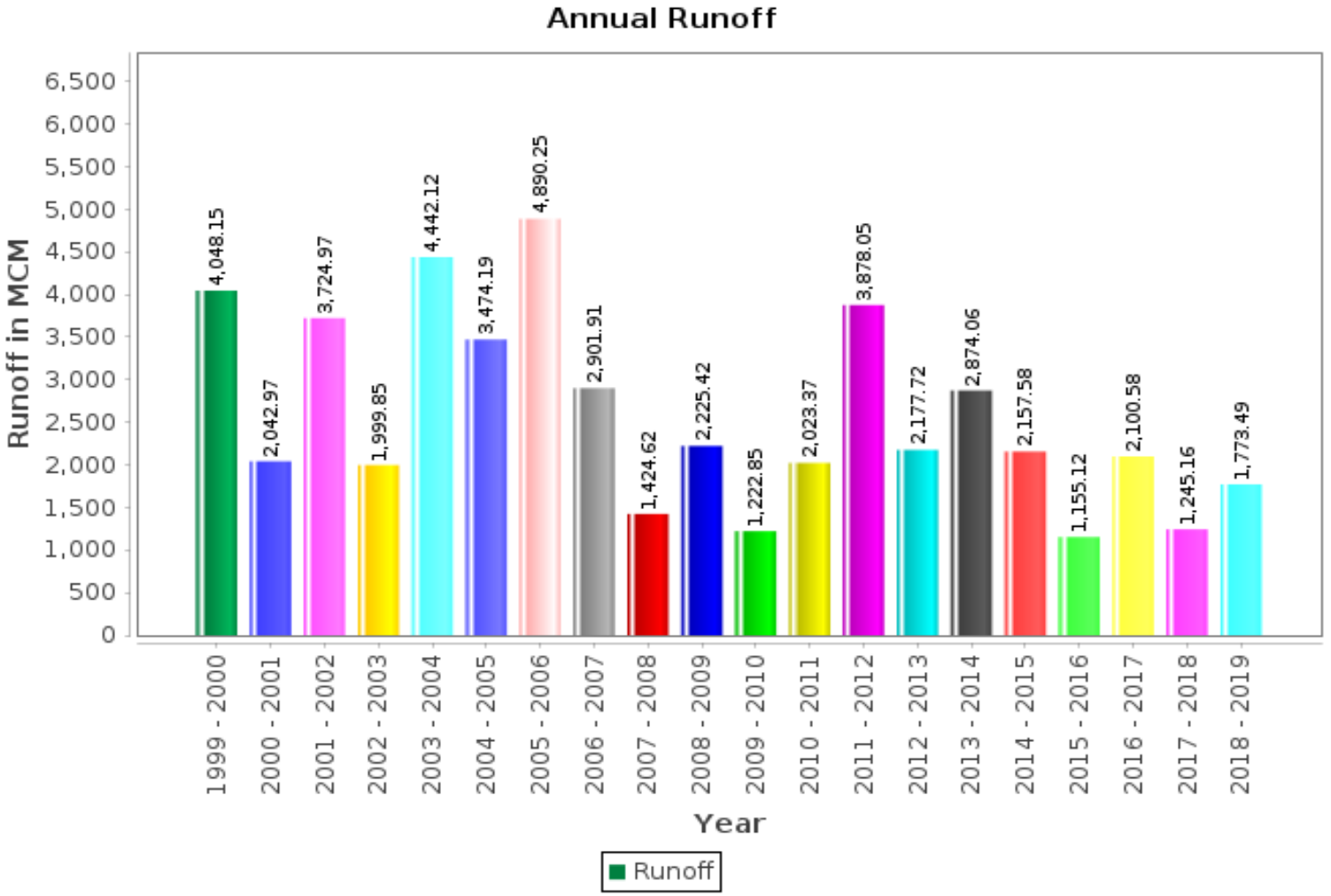
Sub-Division : UNSD, CWC Jabalpur



Annual Runoff Values for the period (1977– 2019)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

Local River : Na Sub-Division : UNSD, CWC Jabalpur



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

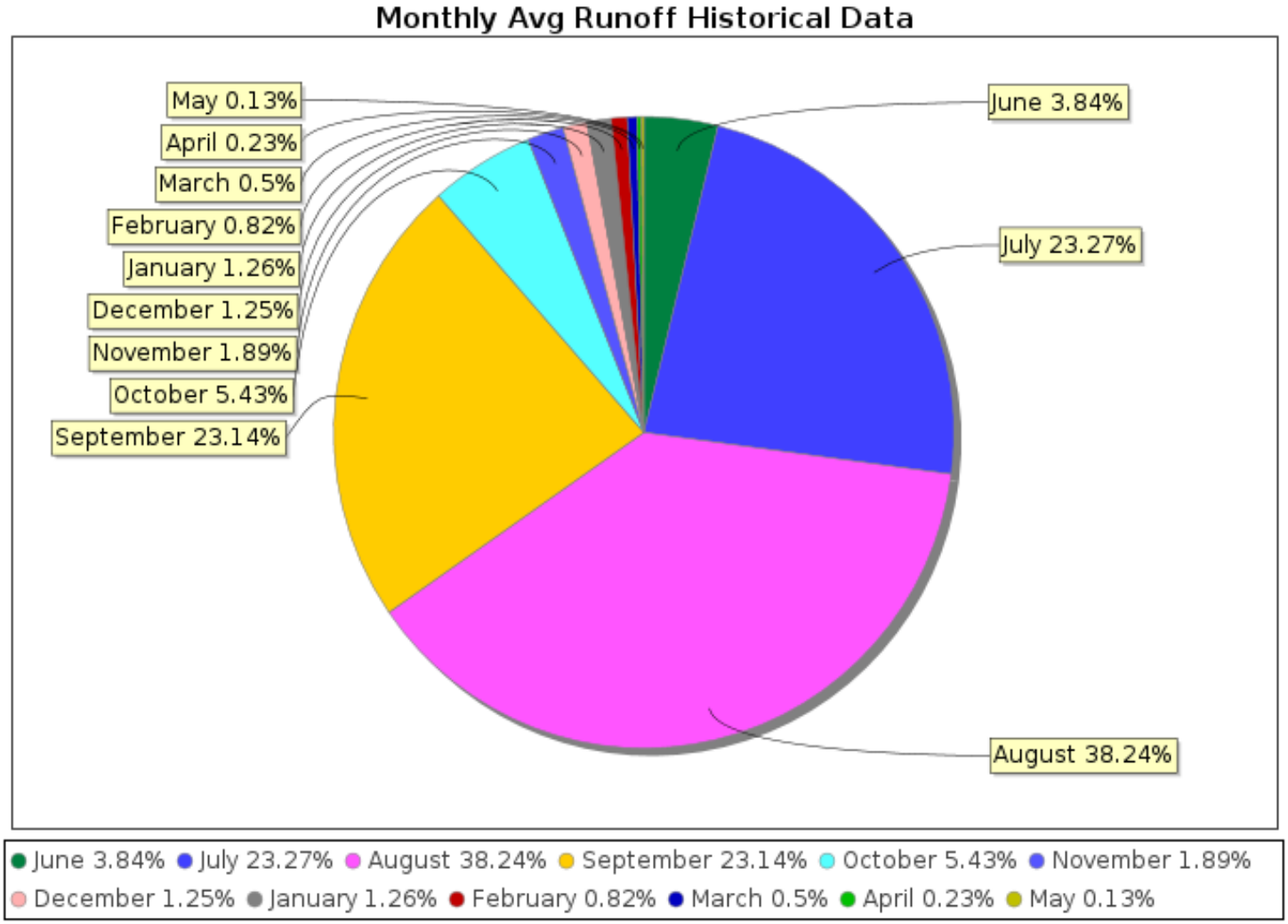
Monthly Average Runoff based on period (1977-2019)

Station Name : Narmada at Manot (010215002)

Division : Narmada Division, Bhopal

Local River : Narmada

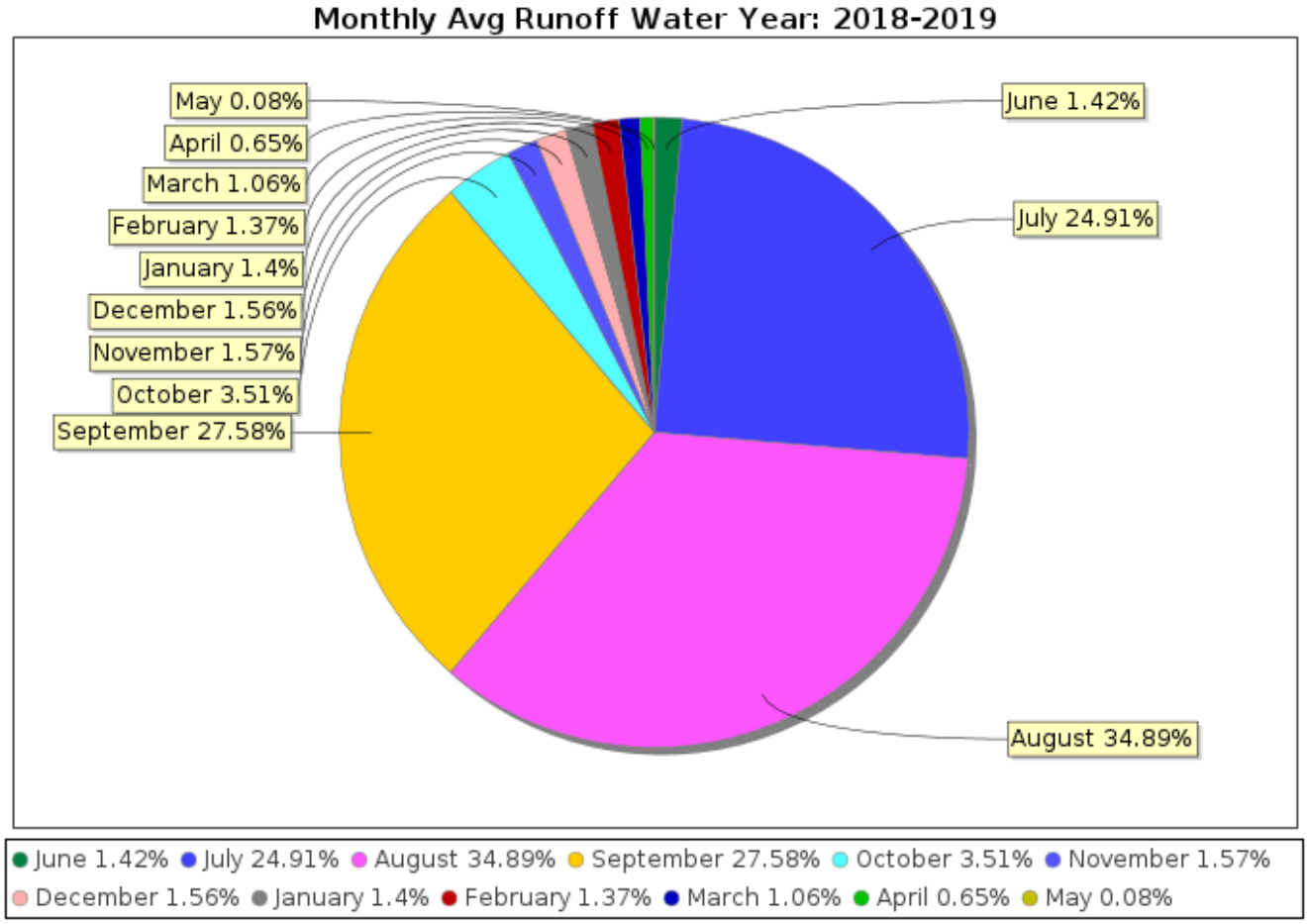
Sub-Division : UNSD, CWC Jabalpur



Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



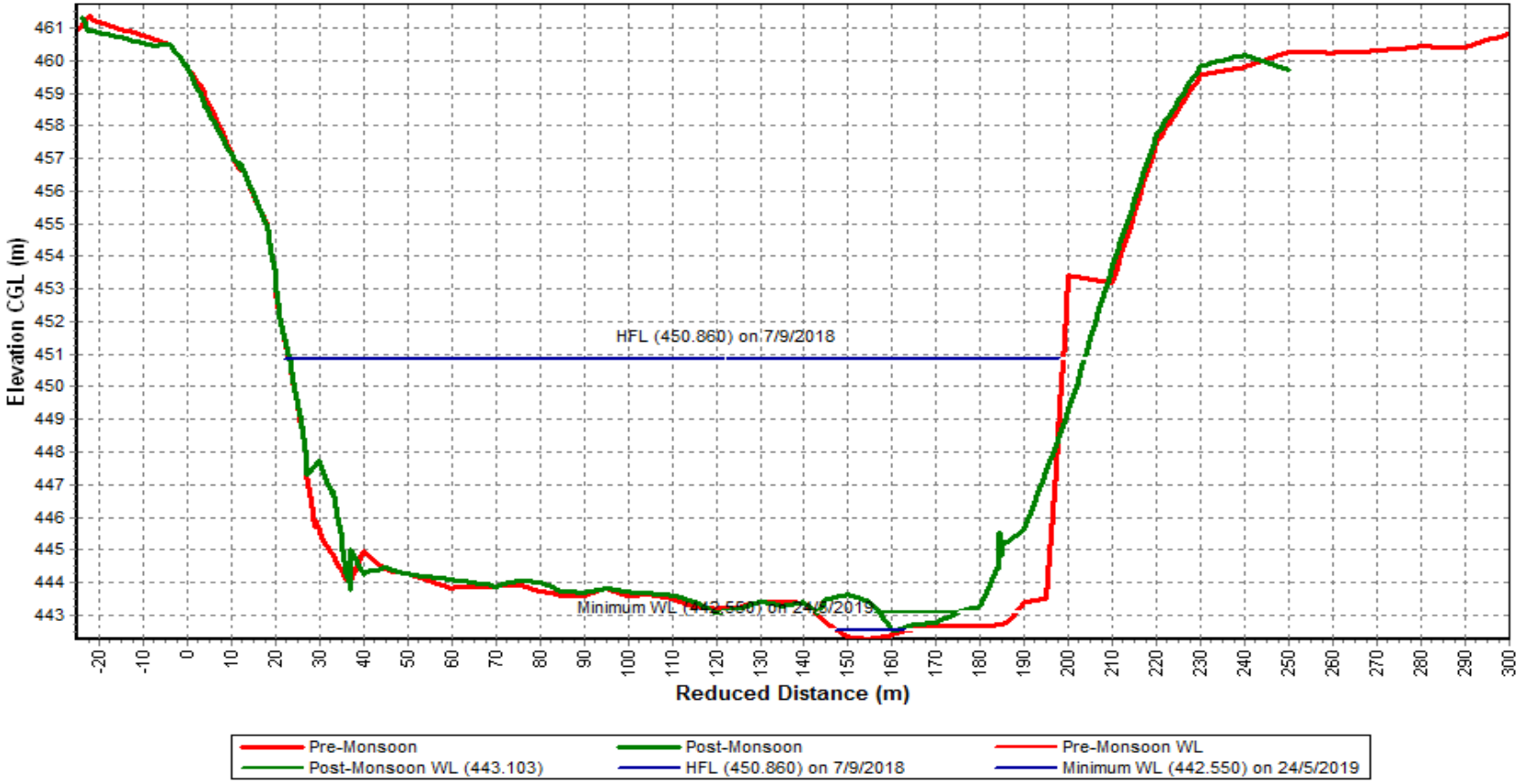
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Manot (010215002)

Division : Narmada Division, Bhopal

Local River : Narmada

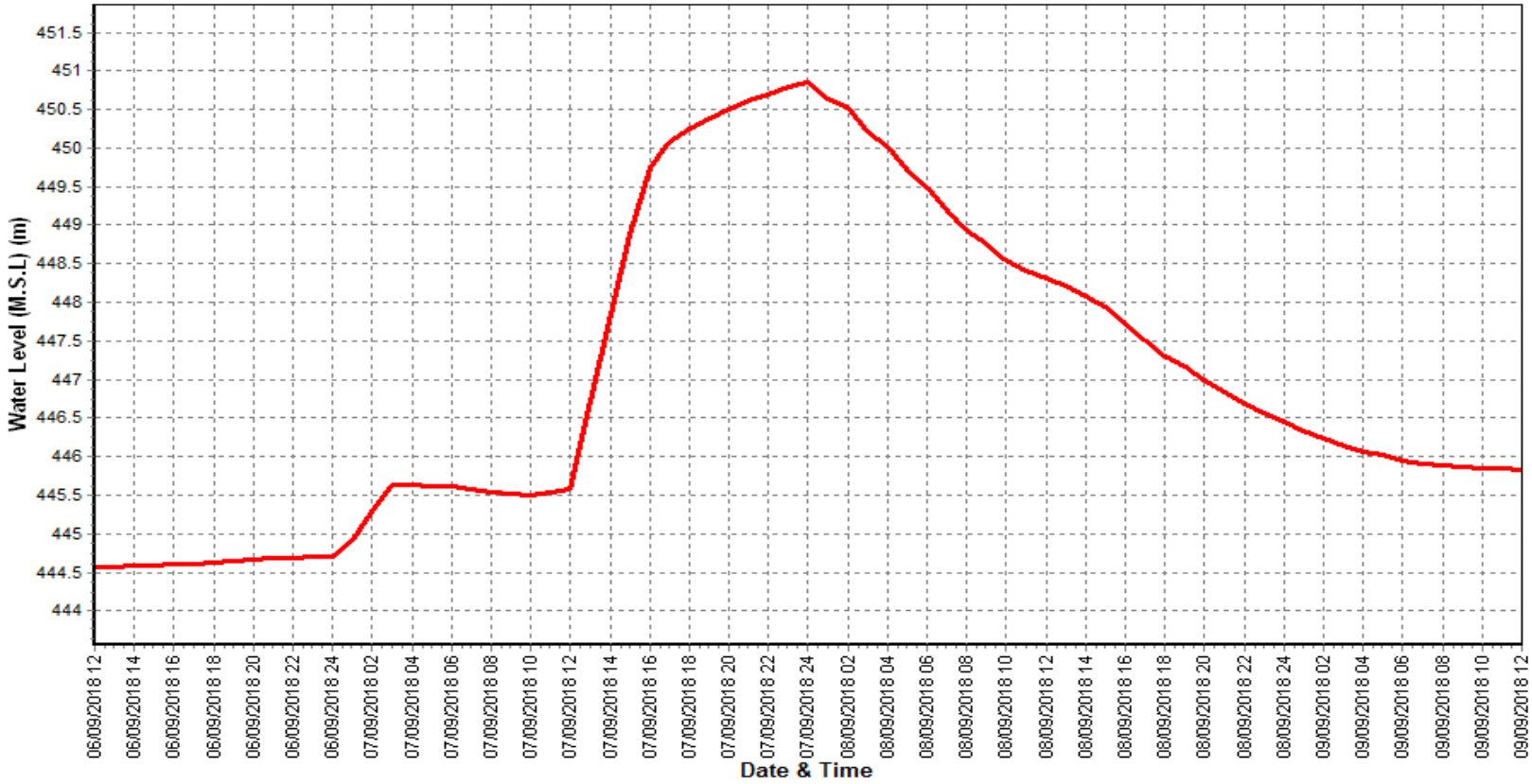
Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

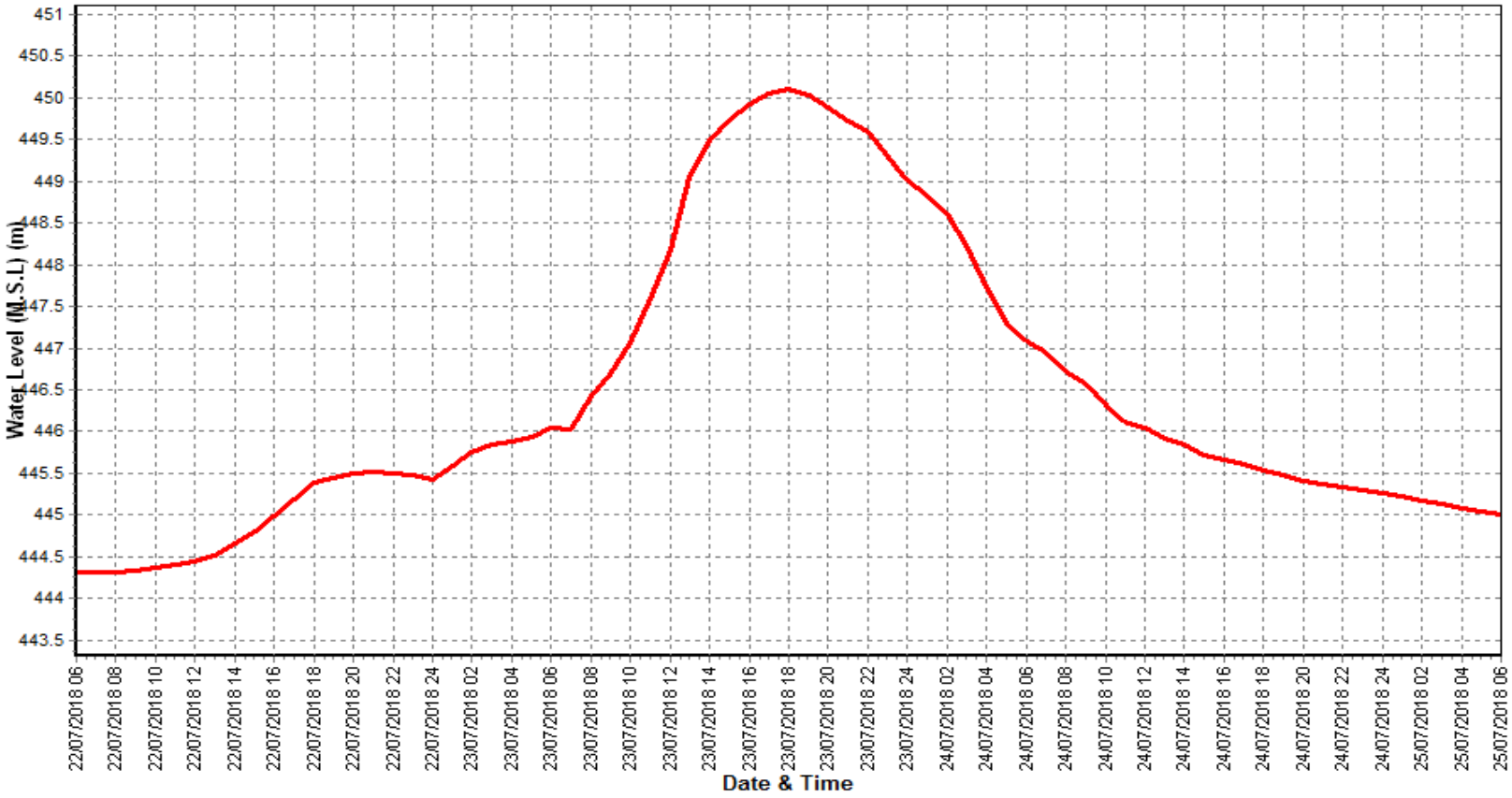
Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

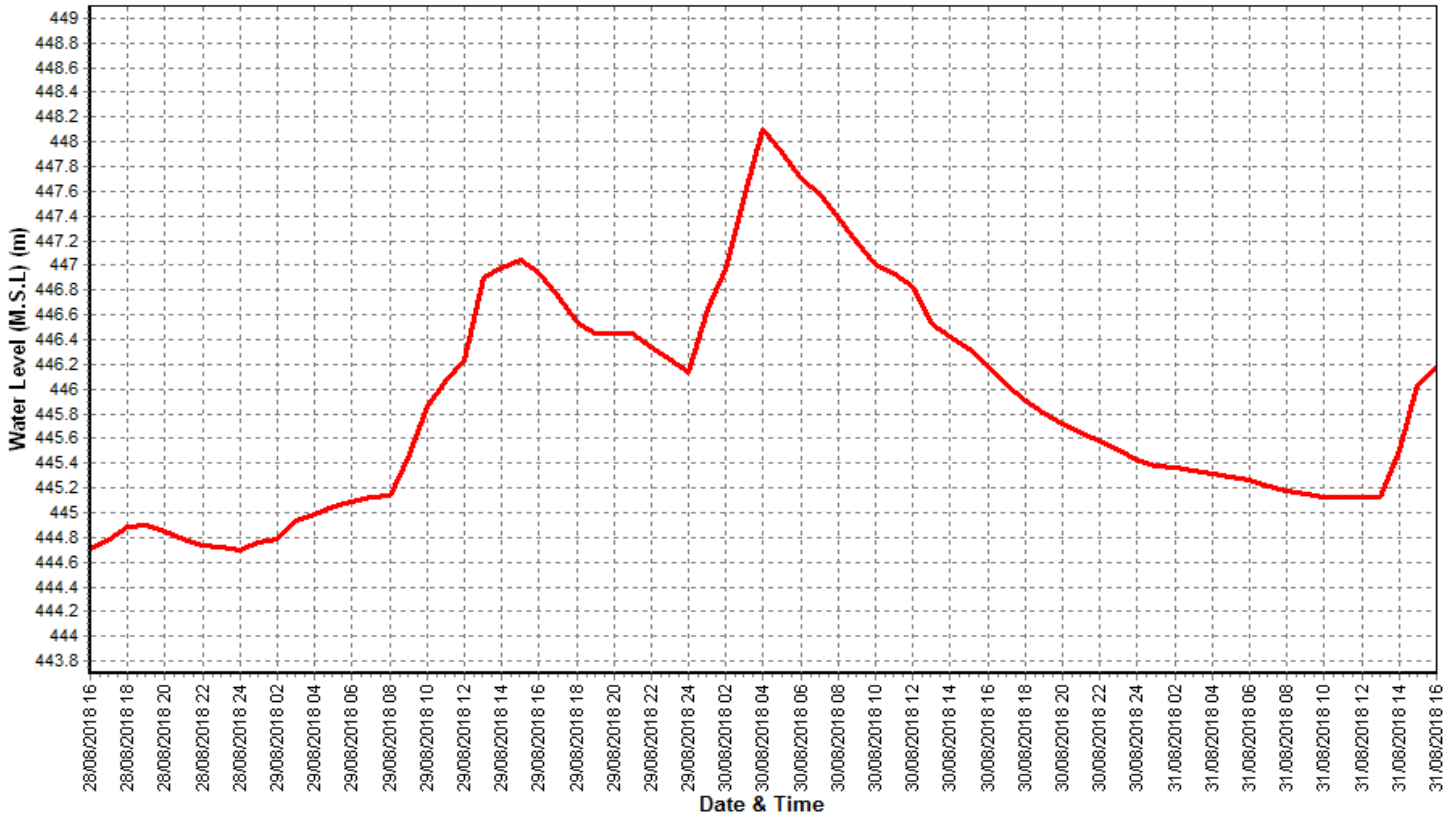
Local River : Narmada Sub-Division : UNSD, CWC Jabalpur

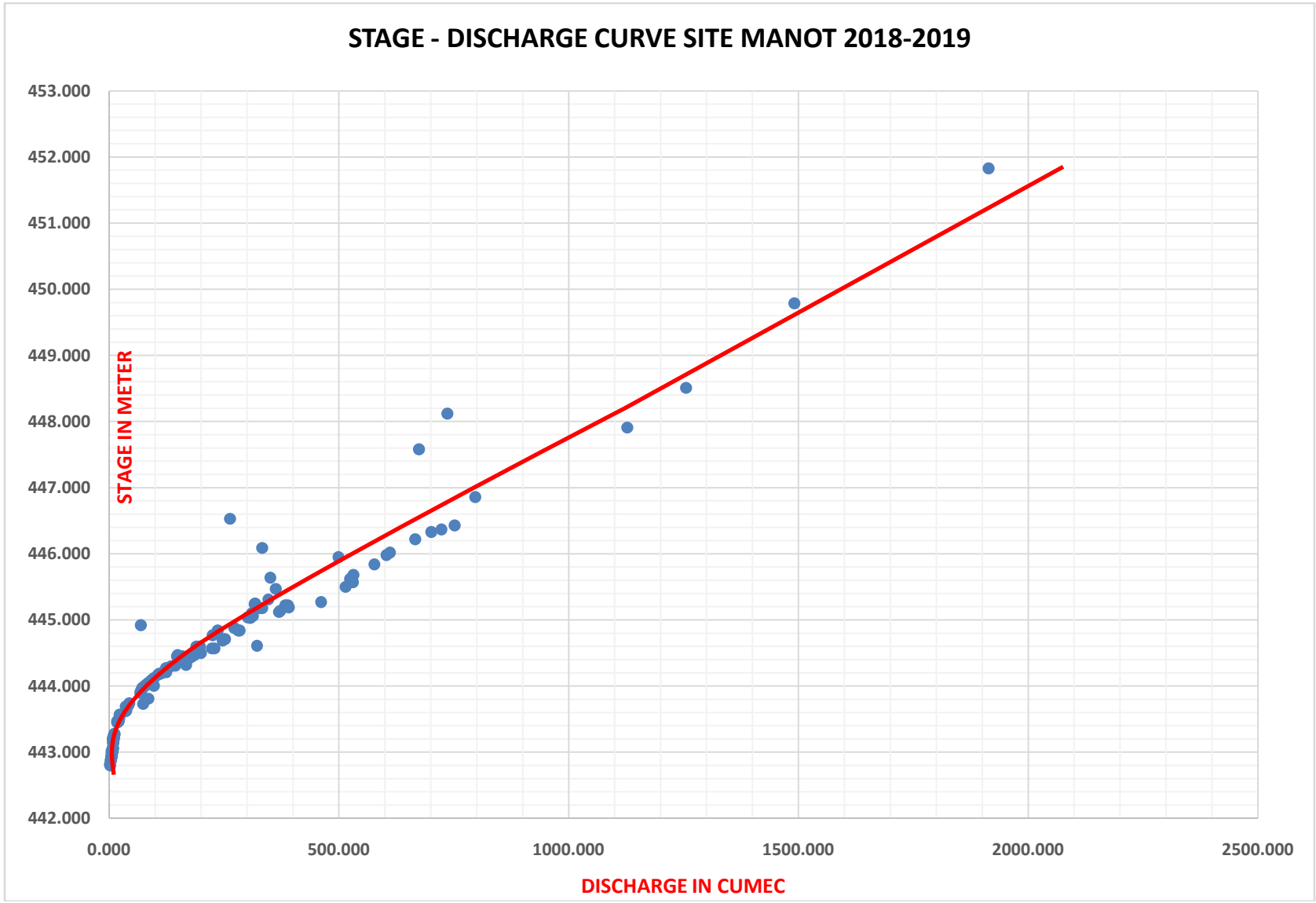


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Manot (010215002) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur




STAGE - DISCHARGE CURVE SITE MANOT 2018-2019
453.000
452.000
451.000
450.000
449.000
448.000
447.000
446.000
445.000
444.000
443.000
442.000
STAGE IN METER
0.000
500.000
1000.000
1500.000
2000.000
2500.000
DISCHARGE IN CUMEC

4.16 Narmada at Dindori

History Sheet

HISTORY SHEET (DISCHARGE AND WATER LEVEL)

			Water Year	:	2018 - 2019
Site	:	Dindori	**Code**	:	008-NDBHP
State	:	Madhya Pradesh	**District**	:	Mandla
Basin	:	NARMADA	**Independent River**	:	Narmada
Tributary	:	-	**Sub Tributary**	:	-
Sub-Sub Tributary	:	-	**Local River**	:	Narmada
Division	:	Narmada Division(ND), Bhopal	**Sub-Division**	:	Upper Narmada Sub-Division, Jabalpur
Drainage Area	:	2292.0 Sq. Km.	**Bank**	:	
Latitude	:	22°56'52''	**Longitude**	:	81°4'33''
Current Zero of Gauge (m)	:	660			

CATEGORY		Opening Date	Closing Date
Gauge	:		
Discharge	:		
Sediment	:		
Water Quality	:		

Reduced Level	Opening Date	Closing Date
660.0	08/06/2014	-
660.0	26/06/1998	08/06/2014
660.0	26/06/1988	26/06/1998

Annual Maximum / Minimum discharge with corresponding Water Level (m.s.l)						
	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1972-1973	0	0	17/06/1972	0	0	17/06/1972
1988-1989	2649	669	02/08/1988	0	0	01/06/1988
1989-1990	875	665.55	13/08/1989	0.84	662.555	01/06/1989
1990-1991	2250	667.5	05/09/1990	1	662.56	19/05/1991
1991-1992	4710	669.64	23/08/1991	1.15	662.585	20/05/1992
1992-1993	3080	668.5	11/09/1992	0.5	662.57	10/05/1993
1993-1994	2560	667.9	27/09/1993	0.3	662.595	05/06/1993
1994-1995	4350	669.45	20/07/1994	0.9	662.55	20/05/1995
1995-1996	1865	667.17	08/08/1995	0.88	662.545	12/06/1995
1996-1997	1515	666.7	01/08/1996	1.03	662.555	06/06/1996
1997-1998	1085	666.11	29/07/1997	1.28	662.595	07/06/1997
1998-1999	1300	666.42	05/07/1998	1.28	662.575	12/05/1999
1999-2000	3907	669.3	31/08/1999	1.09	662.57	31/05/2000
2000-2001	980	666.25	19/07/2000	0.48	662.54	15/05/2001
2001-2002	2290	667.02	30/06/2001	0.81	662.54	24/05/2002
2002-2003	1130	666.12	24/06/2002	0.5	662.53	20/05/2003
2003-2004	2400	668	29/08/2003	0.5	662.52	11/06/2003
2004-2005	1600	667	08/08/2004	0.9	662.53	29/05/2005
2005-2006	1305.69	666.55	22/08/2005	0.3	662.505	21/05/2006
2006-2007	1881.53	667.7	31/07/2006	0.3	662.55	14/05/2007
2007-2008	347.62	664.23	21/08/2007	0.41	662.51	20/05/2008
2008-2009	1253.94	667	19/09/2008	0.71	662.48	30/04/2009
2009-2010	772.39	665.75	15/08/2009	5.01	663.52	25/08/2009
2010-2011	490.12	665.4	03/08/2010	5.34	662.64	06/02/2011
2011-2012	1044.09	666.44	12/08/2011	0	663.06	24/10/2011
2012-2013	570.48	665.5	11/08/2012	0.66	662.83	23/05/2013
2013-2014	844.63	665.75	09/08/2013	0.8	662.85	04/06/2013
2014-2015	1922.22	667.1	14/10/2014	0.73	662.51	26/05/2015
2015-2016	908.88	666.13	23/06/2015	0.61	662.56	10/05/2016
2016-2017	1211.84	664.3	28/08/2016	1.51	662.6	13/05/2017
2017-2018	920.2	666.65	10/08/2017	0.26	662.21	11/05/2018
2018-2019	1919	666.63	07/09/2018	0.32	662.55	01/06/2018

Stage Discharge Sheet for Narmada at Dindori for the period 2018-19

Day	June		July		August		September	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	0.32	662.55	5.28	662.7	45.73	663.92	94.6	664.23
2	0.34	662.55	97.9	664.25	75.34	664.08	83.63	664.16
3	0.39	662.64	47.14	663.94	56.66	663.97	72.66	664.09
4	0.46	662.78	20.35	663.55	33.61	663.82	65.01	664.04
5	0.51	662.81	14.63	663.33	29.64	663.64	63.64	664
6	0.51	662.84	11.04	663	21.27	663.26	78.49	664.1
7	1.4	662.74	9.78	662.95	18.9	663.21	1919	666.63
8	1.28	662.68	23.92	663.9	154.6	664.43	268.9	666.04
9	21.95	663.43	17.22	663.45	86.61	664.15	143.78	664.45
10	16.28	663.28	22.7	663.81	71.1	664.05	92.88	664.21
11	34.6	663.78	35.68	663.82	96.98	665.25	77.79	664.13
12	10.15	663.08	95.51	664.24	91.69	664.52	63.79	664.05
13	16.19	663.11	134.4	664.39	112.02	664.28	61.6	664.01
14	2.73	662.73	45.41	663.92	88.18	664.14	58.87	663.96
15	2.81	662.79	151.5	664.45	165.1	664.58	44.91	663.91
16	1.7	662.66	127.8	664.33	196.5	664.76	42.87	663.98
17	1.6	662.65	181.6	664.61	108.2	664.3	38.79	663.82
18	1.42	662.63	144.8	664.46	93.35	664.21	32.65	663.73
19	2.72	662.72	87.33	664.11	71.23	664.36	25.4	663.59
20	1.58	662.67	112.1	664.25	93.52	664.26	21.81	663.44
21	1.52	662.63	69.49	664.02	157.03	664.64	29.87	663.66
22	1.62	662.67	39.92	663.86	82.46	664.22	36.47	663.84
23	1.49	662.66	176.68	664.6	60.53	664.09	39.08	664.1
24	1.67	662.91	94.44	664.21	70.3	664.02	41.68	663.9
25	1.56	662.75	68.83	664.02	57.88	663.99	33.96	663.79
26	1.62	662.67	77.59	664.06	59.71	664	19.55	663.49
27	10.56	662.99	174.9	664.58	92.72	664.18	21.46	663.39
28	2.98	662.78	92.16	664.21	74.53	664.1	19.22	663.28
29	7.44	662.76	66.16	664.04	152.05	664.63	18.76	663.21
30	7.07	662.73	56.99	663.98	158.03	664.63	16.39	663.06
31			56.2	663.96	118.4	664.37		
Ten-Daily Mean								
I Ten-Daily	4.34	662.83	27	663.49	59.35	663.85	288.26	664.59
II Ten-Daily	7.55	662.88	111.61	664.26	111.68	664.47	46.85	663.86
III Ten-Daily	3.75	662.75	88.49	664.14	98.51	664.26	27.64	663.57
Monthly								
Min.	0.32	662.55	5.28	662.7	18.9	663.21	16.39	663.06
Max.	34.6	663.78	181.6	664.61	196.5	665.25	1919	666.63
Mean	5.21	662.82	75.7	663.96	89.85	664.19	120.92	664.01

Annual Runoff in MCM : 861.99 **Annual Runoff in mm : 376.09**

Peak Observed Discharge = 1919 cumecs on 7/9/2018 Corres. Water Level 666.63 m

Lowest Observed Discharge = 0.32cumecs on 1/6/2018 Corres. Water Level 662.55 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Dindori for the period 2018-19

Day	October		November		December		January	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	14.49	662.94	6.28	663.06	0.0	0.0	4.38	662.85
2	13.83	662.92	0.0	0.0	0.0	0.0	4.37	662.85
3	13.5	662.91	0.0	0.0	0.0	0.0	4.26	662.85
4	12.04	662.89	0.0	0.0	0.0	0.0	4.38	662.85
5	13.07	662.89	0.0	0.0	0.0	0.0	4.5	662.85
6	12.35	662.88	0.0	0.0	0.0	0.0	4.48	662.85
7	12.35	662.88	0.0	0.0	0.0	0.0	4.47	662.85
8	10.14	662.85	0.0	0.0	0.0	0.0	3.91	662.85
9	9.69	662.83	0.0	0.0	0.0	0.0	4.25	662.85
10	9.69	662.82	0.0	0.0	0.0	0.0	4.36	662.85
11	9.08	662.79	0.0	0.0	0.0	0.0	4.44	662.85
12	8.72	662.78	0.0	0.0	0.0	0.0	4.19	662.85
13	9.84	662.82	0.0	0.0	0.0	0.0	4.1	662.85
14	10.24	662.83	0.0	0.0	0.0	0.0	3.94	662.85
15	9.43	662.81	0.0	0.0	4.24	662.85	3.87	662.8
16	9.02	662.78	0.0	0.0	4.3	662.85	3.93	662.8
17	8.33	662.77	0.0	0.0	4.37	662.85	3.95	662.8
18	8.06	662.75	0.0	0.0	4.67	662.87	3.86	662.8
19	8.59	662.73	0.0	0.0	4.47	662.87	3.67	662.8
20	8.86	662.72	0.0	0.0	4.5	662.87	3.65	662.8
21	8.84	662.72	0.0	0.0	4.5	662.87	3.63	662.8
22	8.82	662.72	0.0	0.0	4.47	662.87	3.67	662.8
23	8.59	662.72	0.0	0.0	4.49	662.87	3.71	662.8
24	6.4	662.72	0.0	0.0	4.52	662.87	3.76	662.8
25	6.61	662.71	0.0	0.0	4.6	662.87	3.85	662.8
26	7	662.71	0.0	0.0	4.68	662.87	3.77	662.8
27	6.57	662.71	0.0	0.0	6.22	662.87	3.74	662.8
28	6.51	663.11	0.0	0.0	4.57	662.87	3.7	662.8
29	6.51	663.09	0.0	0.0	4.5	662.85	3.61	662.8
30	6.62	663.07	0.0	0.0	4.43	662.85	3.73	662.8
31	6.46	663.06	0.0	0.0	4.36	662.85	3.63	662.8
Ten-Daily Mean								
I Ten-Daily	12.12	662.88	0.63	66.31	0	0	4.33	662.85
II Ten-Daily	9.02	662.78	0	0	2.65	397.72	3.96	662.82
III Ten-Daily	7.18	662.85	0	0	4.67	662.86	3.71	662.8
Monthly								
Min.	6.4	662.71	6.28	663.06	4.24	662.85	3.61	662.8
Max.	14.49	663.11	6.28	663.06	6.22	662.87	4.5	662.85
Mean	9.44	662.84	0.21	22.1	2.44	353.53	4	662.82

Peak Computed Discharge = 165.1 cumecs on 15/8/2018 Corres. Water Level 664.58 m
Lowest Computed Discharge = 0.39cumecs on 3/6/2018 Corres. Water Level 662.64 m

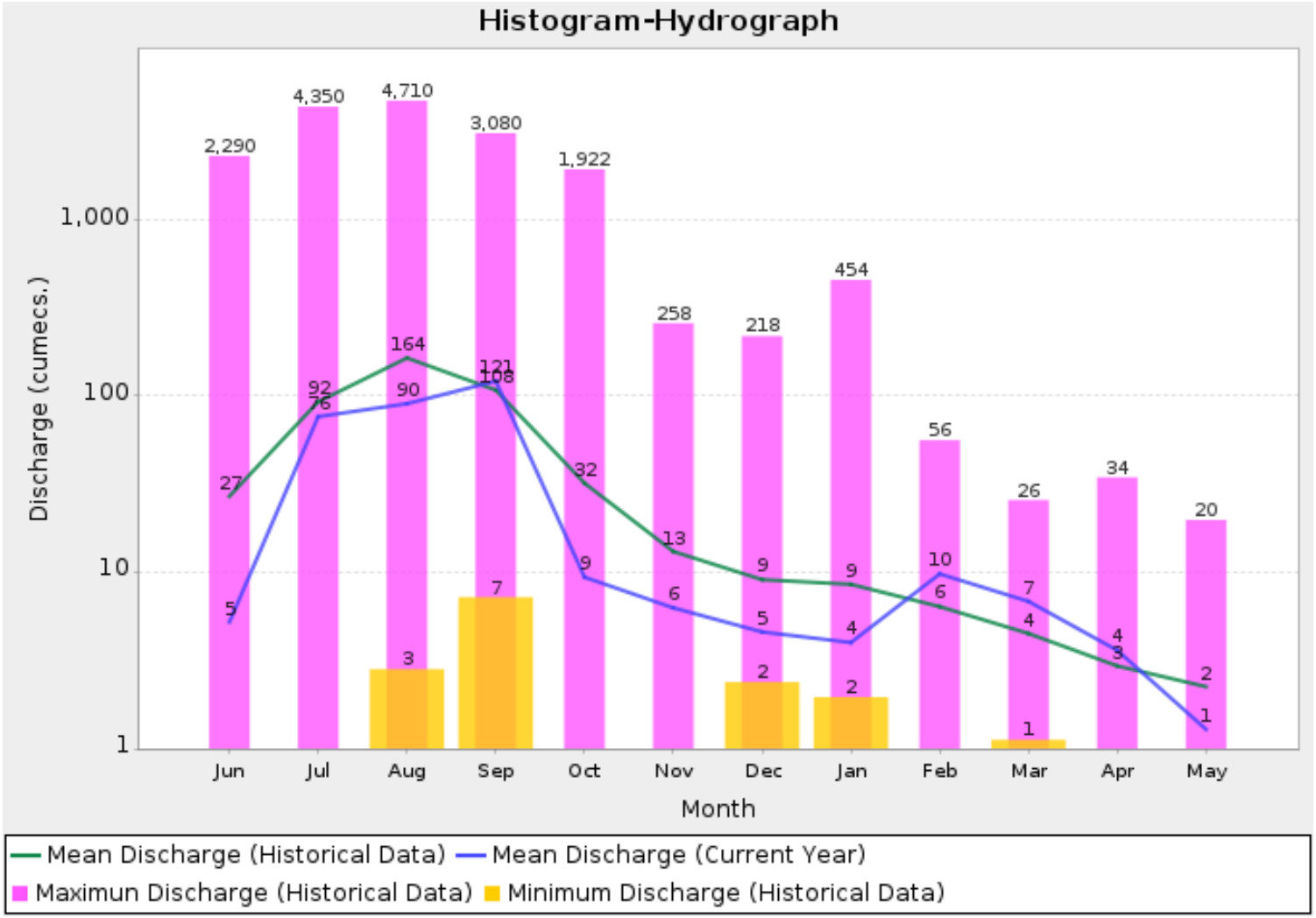
Stage Discharge Sheet for Narmada at Dindori for the period 2018-19

Day	February		March		April		May	
	Q	W.L	Q	W.L	Q	W.L	Q	W.L
1	3.61	662.8	11.95	663.08	3.76	662.75		
2	3.67	662.8	11.39	663.03	3.71	662.75		
3	3.6	662.8	11.02	663.03	3.75	662.75	1.31	663
4	3.52	662.8	10.84	663	3.73	662.75	1.28	663
5	3.56	662.8	10.65	663	3.73	662.75	1.55	663
6	3.58	662.8	11.09	663	3.61	662.75	1.81	663
7	3.61	662.8	11.15	663	3.62	662.75	1.27	663
8	3.35	662.8	10.69	663	3.64	662.75	1.54	663.1
9	3.41	662.8	10.79	663	3.58	662.75	1.42	663.11
10	3.44	662.8	10.84	663	3.49	662.75	1.06	663.06
11	3.47	662.8	10.89	663	3.16	662.75	0.0	0.0
12	16.52	663.2	9.1	662.95	3.45	662.75	0.0	0.0
13	15.45	663.2	5.88	662.95	0.0	0.0	0.0	0.0
14	13.53	663.15	4.45	662.85	0.0	0.0	0.0	0.0
15	13.51	663.15	4.5	662.8	0.0	0.0	0.0	0.0
16	17.45	663.15	4.46	662.8	0.0	0.0	0.0	0.0
17	15.11	663.15	4.42	662.8	0.0	0.0	0.0	0.0
18	12.77	663.15	4.38	662.8	0.0	0.0	0.0	0.0
19	13.16	663.15	4.38	662.8	0.0	0.0	0.0	0.0
20	13.33	663.15	4.36	662.8	0.0	0.0	0.0	0.0
21	13.58	663.15	4.3	662.79	0.0	0.0	0.0	0.0
22	13.73	663.15	4.23	662.77	0.0	0.0	0.0	0.0
23	13.63	663.15	4.22	662.77	0.0	0.0	0.0	0.0
24	13.69	663.15	4.24	662.77	0.0	0.0	0.0	0.0
25	13.75	663.15	4.25	662.77	0.0	0.0	0.0	0.0
26	11.81	663.08	4.13	662.77	0.0	0.0	0.0	0.0
27	11.79	663.08	3.86	662.75	0.0	0.0	0.0	0.0
28	11.93	663.08	3.85	662.75	0.0	0.0	0.78	662.63
29			3.82	662.75				
30			3.78	662.75				
31			3.78	662.75				
Ten-Daily Mean								
I Ten-Daily	3.54	662.8	11.04	663.01	3.66	662.75	1.12	530.43
II Ten-Daily	13.43	663.13	5.68	662.85	0.66	132.55	0	0
III Ten-Daily	12.99	663.12	4.04	662.76	0	0	0.15	120.48
Monthly								
Min.	3.35	662.8	3.78	662.75	3.16	662.75	0.78	662.63
Max.	17.45	663.2	11.95	663.08	3.76	662.75	1.81	663.11
Mean	9.98	663.02	6.92	662.88	1.44	265.1	0.42	216.97

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 1988-2018)



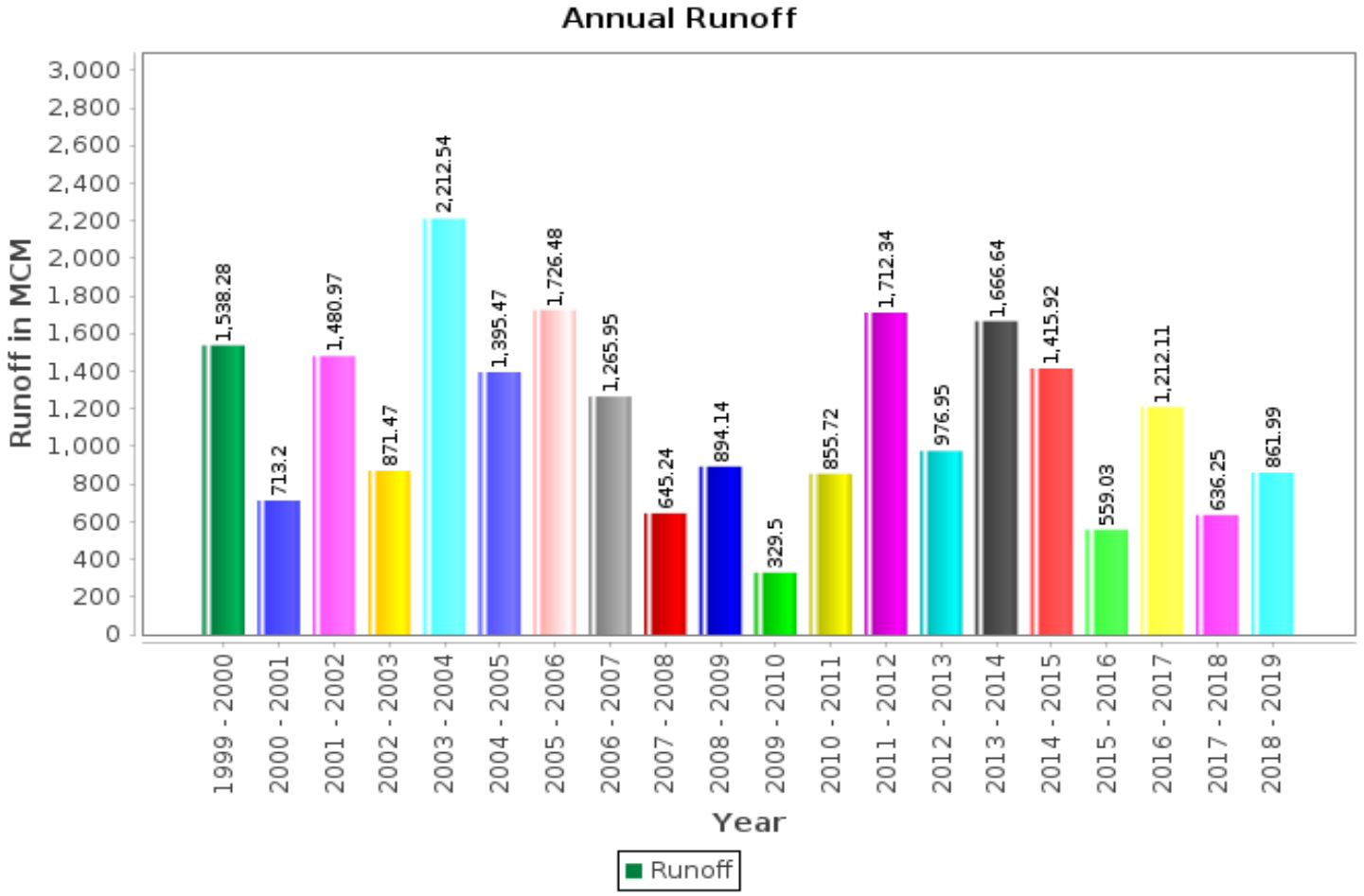
Annual Runoff Values for the period (1988– 2018)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : UNSD, CWC Jabalpur



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

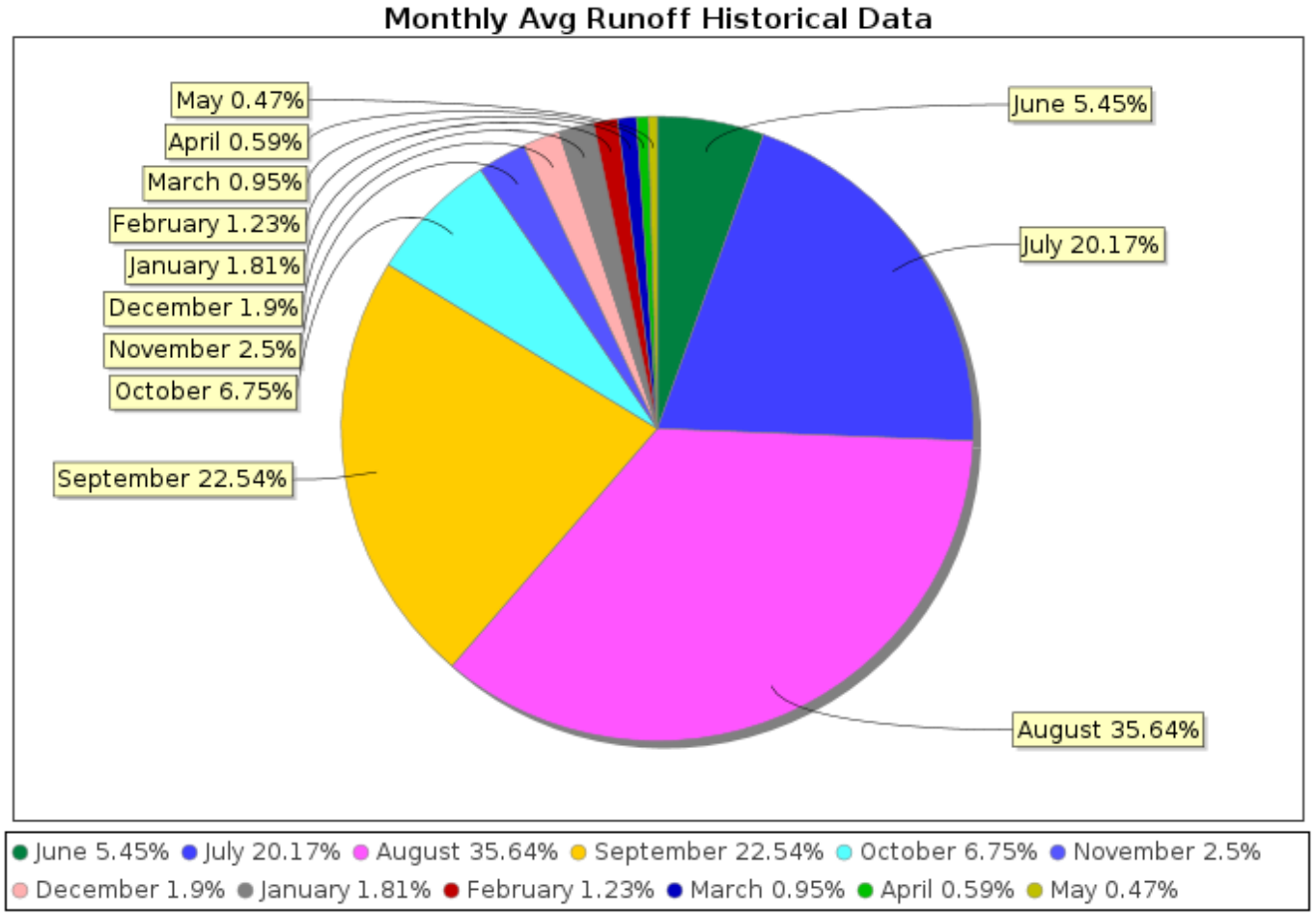
Monthly Average Runoff based on period (1988-2018)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : UNSD, CWC Jabalpur



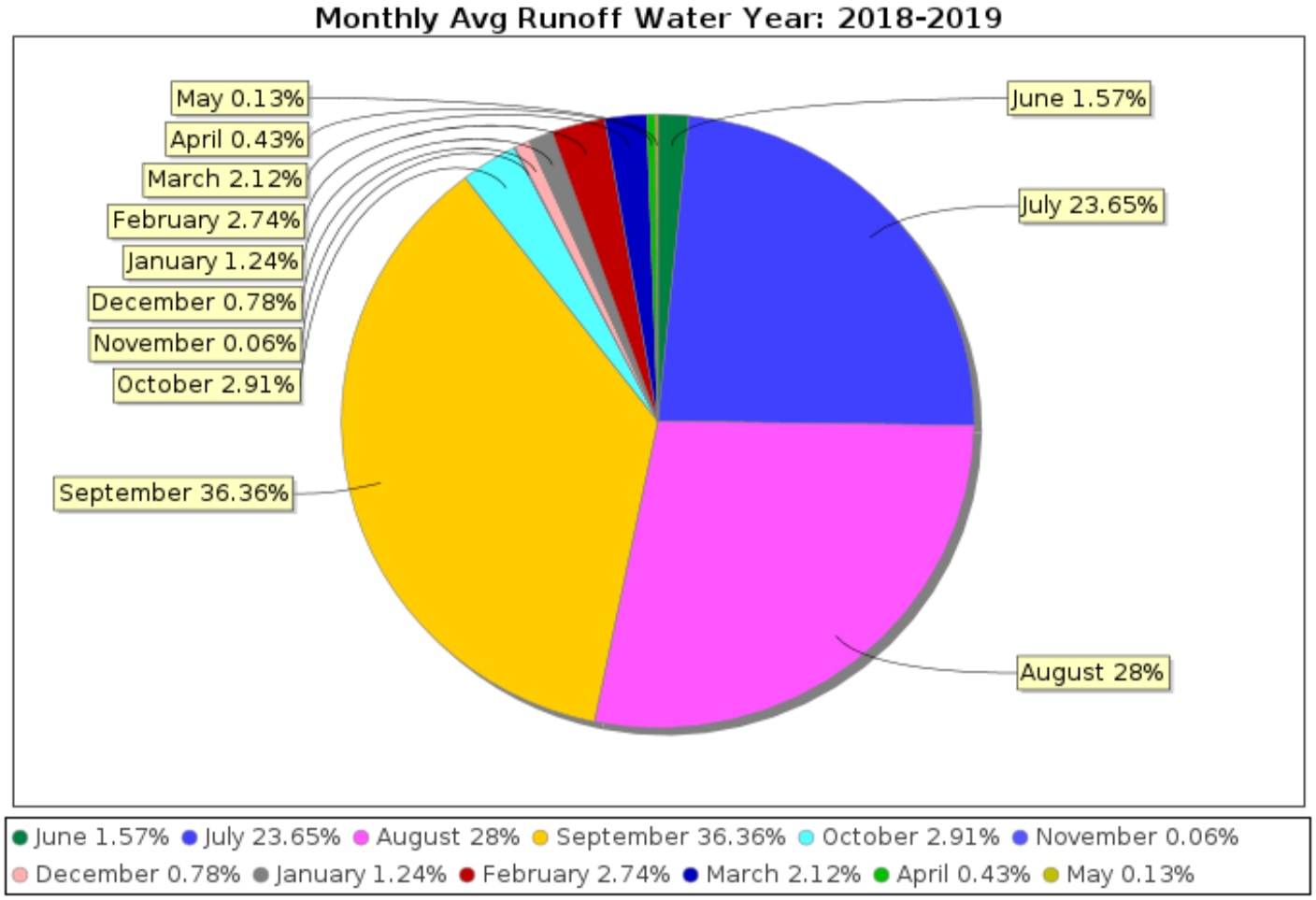
Monthly Runoff for the Year (2018-19)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

Sub-Division : UNSD, CWC Jabalpur



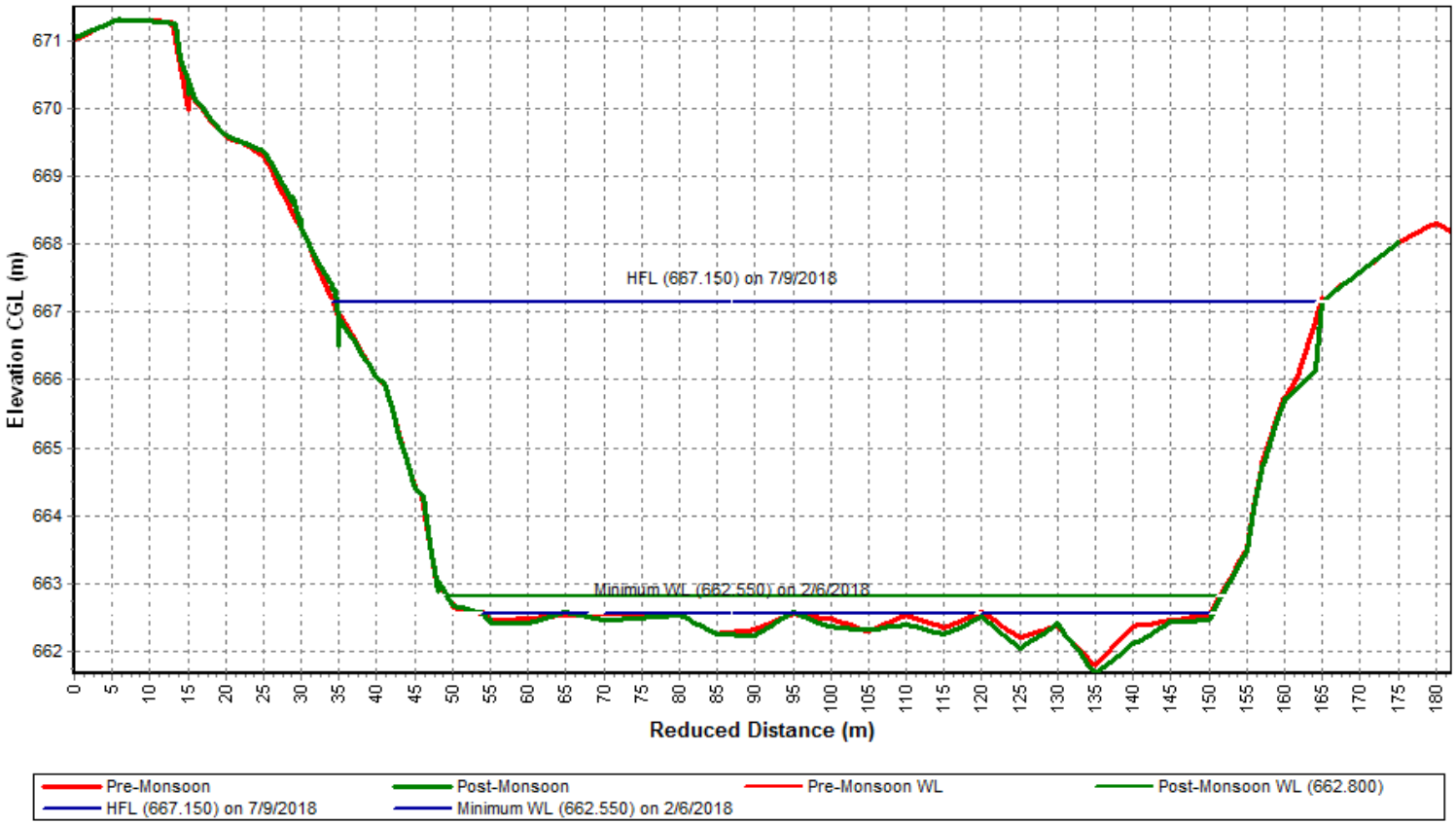
Pre-Monsoon & Post-Monsoon X-Section for Water Year (2018-19)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

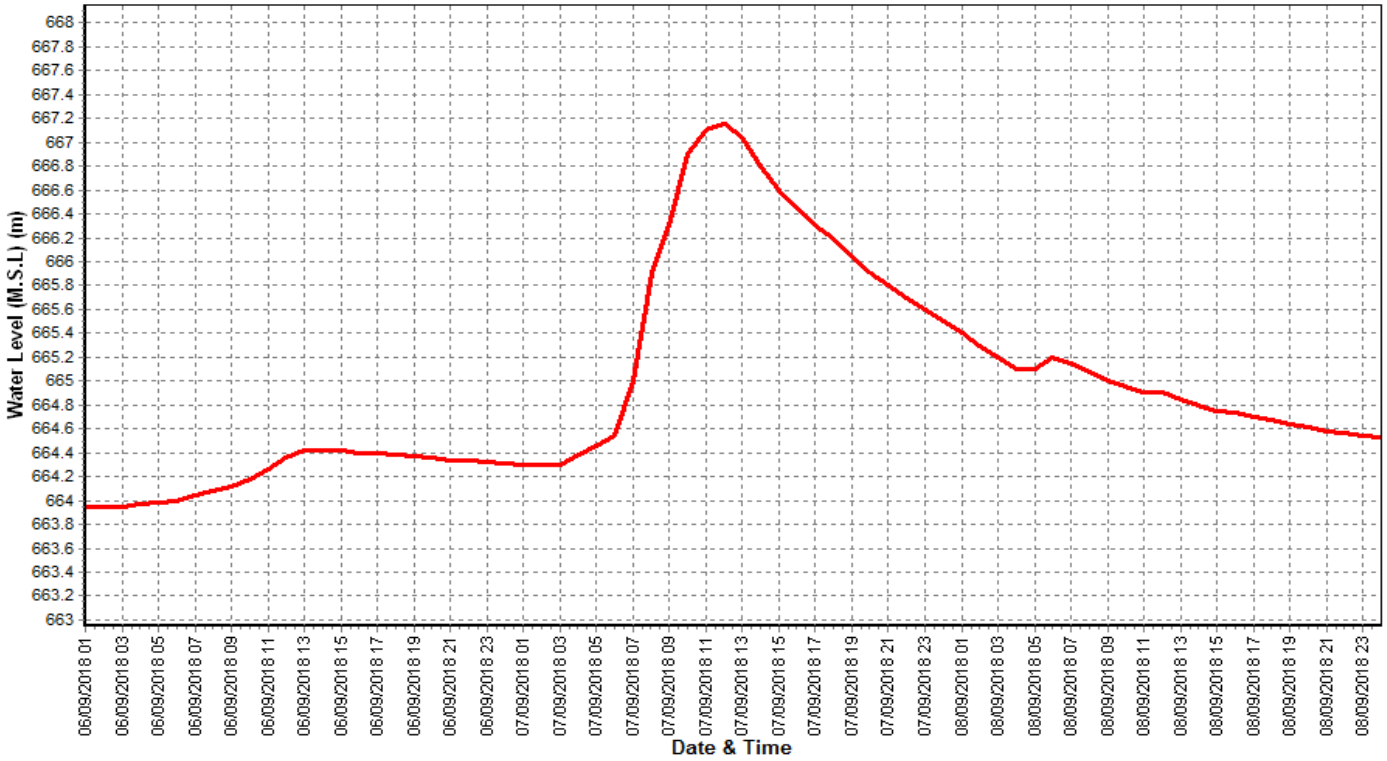
Sub-Division : UNSD, CWC Jabalpur



Water Level vs. Time - Graph of Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Dindori (010215001) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur



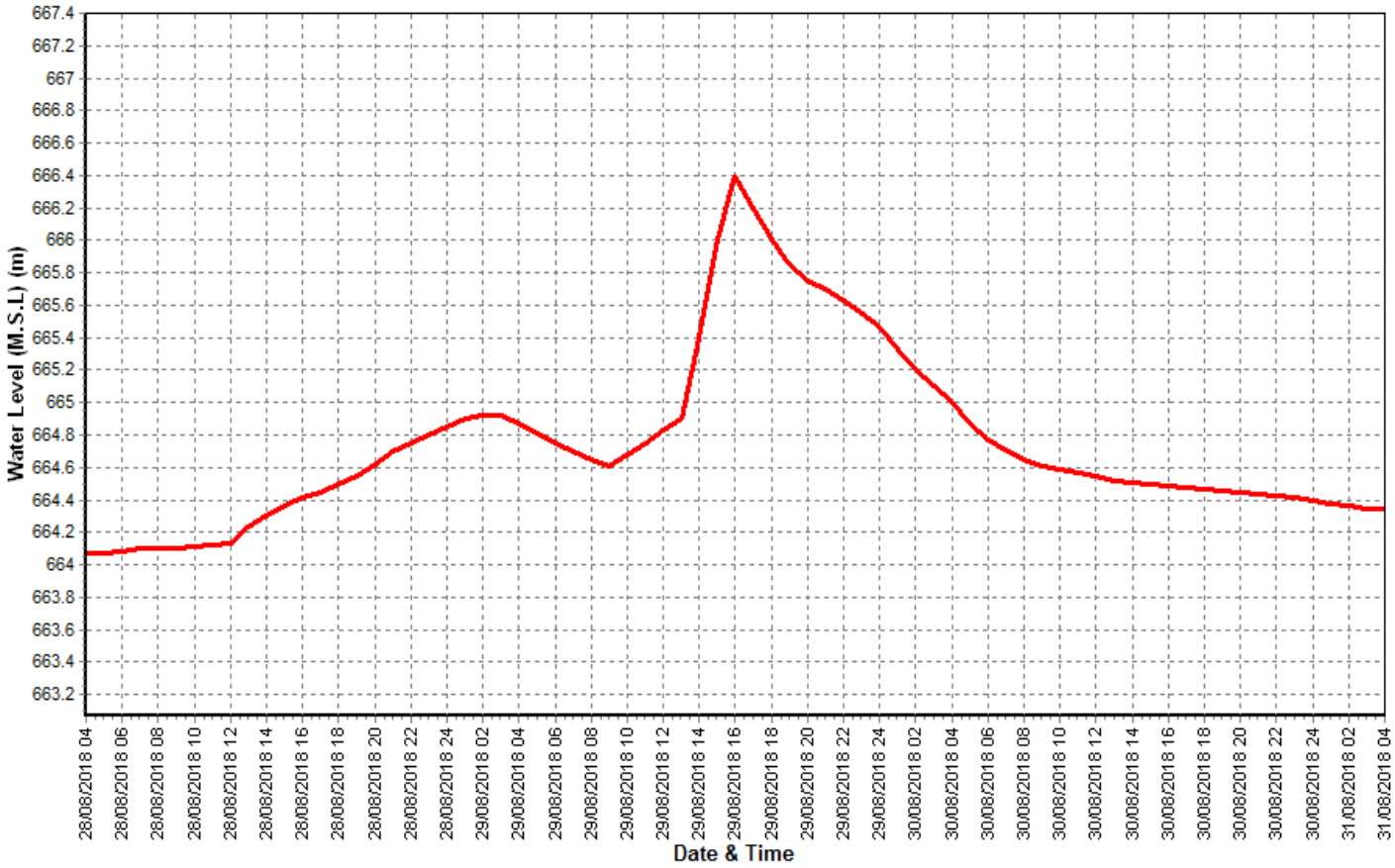
Water Level vs. Time - Graph of 2nd Highest Flood Peak during the Year (2018-19)

Station Name : Narmada at Dindori (010215001)

Division : Narmada Division, Bhopal

Local River : Narmada

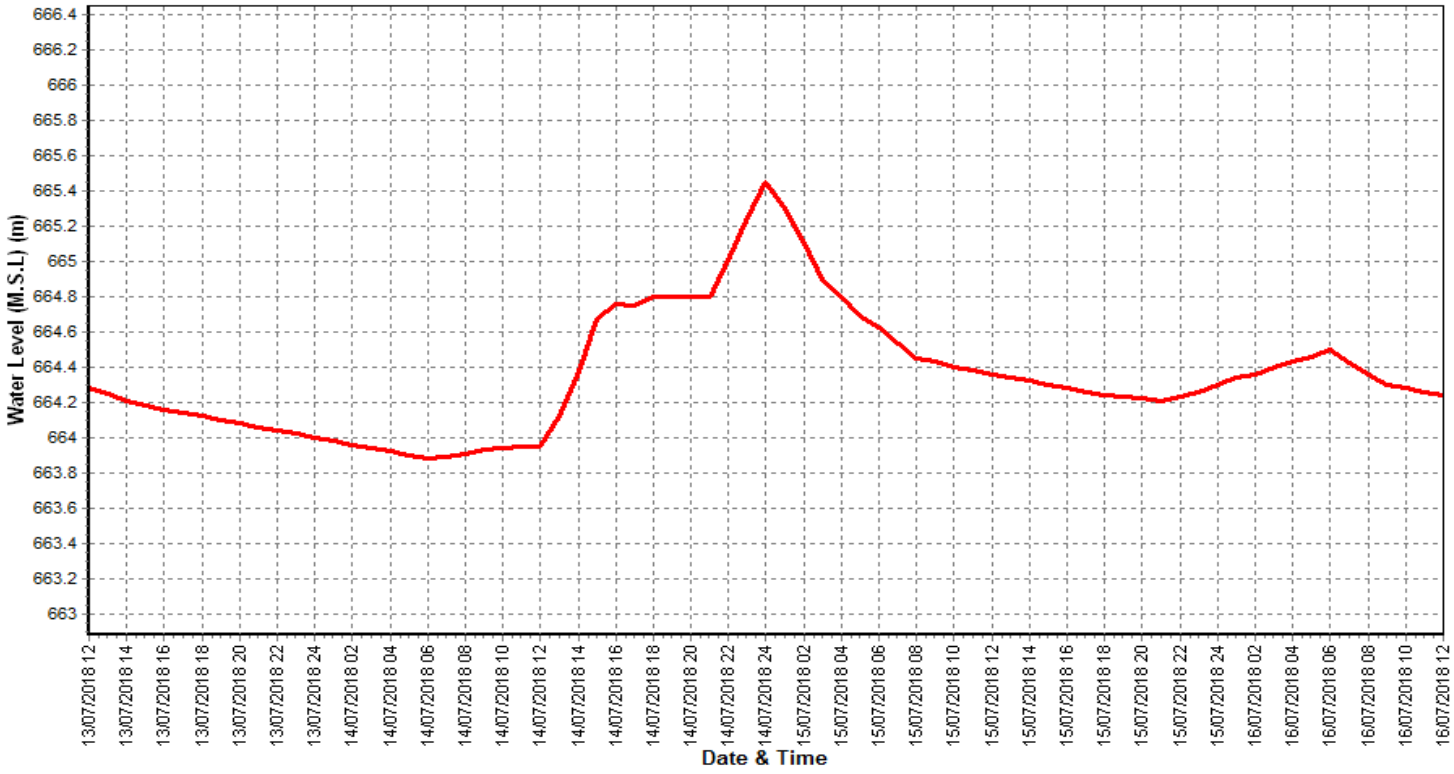
Sub-Division : UNSD, CWC Jabalpur

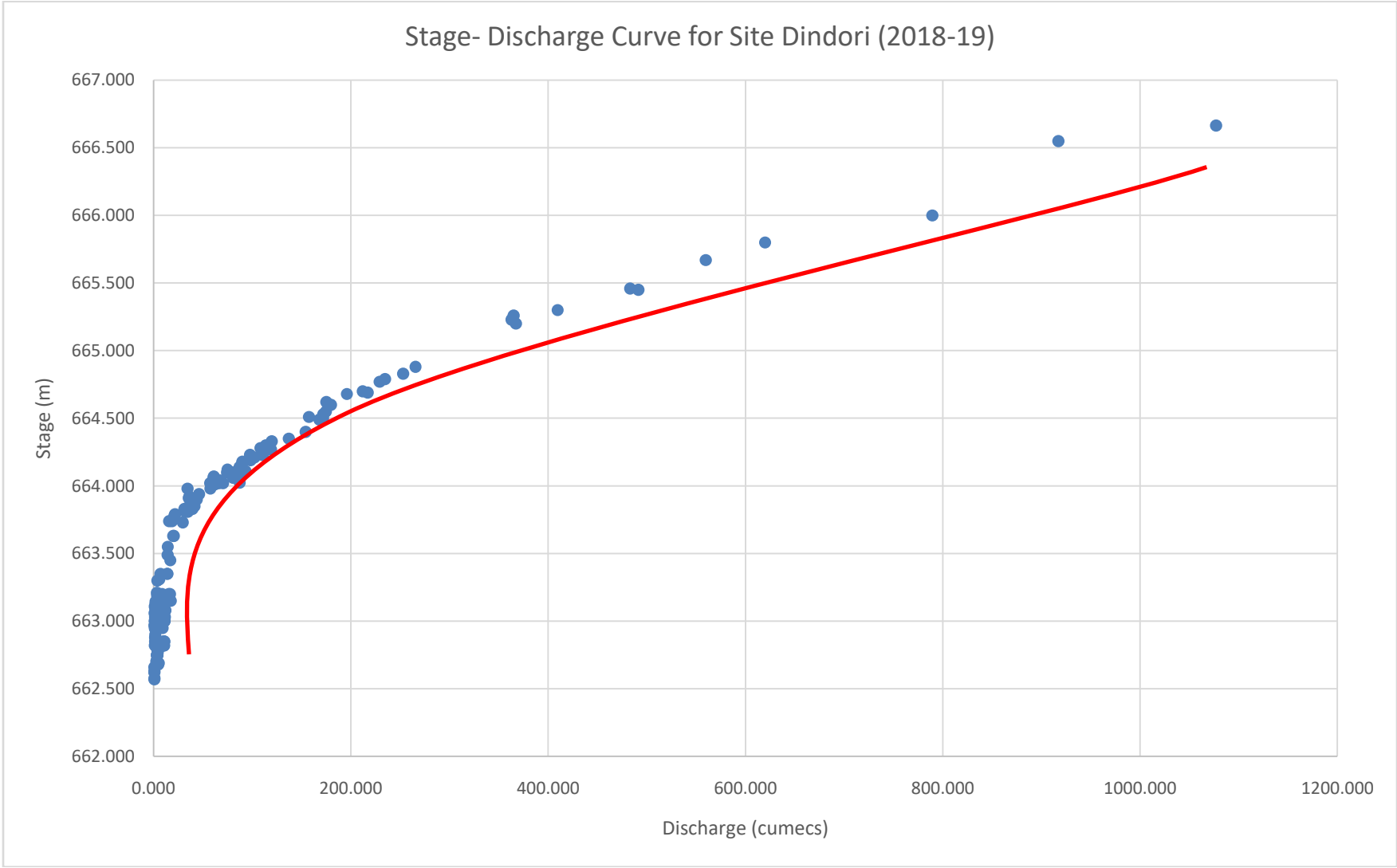


Water Level vs. Time - Graph of 3rd Highest Flood Peak during the Year (2015-16)

Station Name : Narmada at Dindori (010215001) Division : Narmada Division, Bhopal

Local River : Narmada Sub-Division : UNSD, CWC Jabalpur




Stage- Discharge Curve for Site Dindori (2018-19)
667.000
666.500
666.000
665.500
665.000
664.500
664.000
663.500
663.000
662.500
662.000
Stage (m)
0.000
200.000
400.000
600.000
800.000
1000.000
1200.000
Discharge (cumecs)

4.17 Narmada at Bijora

History sheet

			Water Year	**:**	**2018-19**
Site	**:**	**Narmada at Bijora**	**Code**	**:**	**NA**
State	:	Madhya Pradesh	District		Jabalpur
Basin	:	Narmada	Independent River	:	Narmada
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Narmada
Division	:	DDPC, Bhopal	Sub-Division	:	SDDPC, Bhopal
Drainage Area	:	14561 Sq. Km.	Bank	:	Left
Latitude	:	22°55'30"	Longitude	:	79°55'30"
Zero of Gauge (m)	:	366 (M.S.L)	01/06/1950		
		Opening Date	Closing Date		
Gauge	:	01/06/1950			
Discharge	:	01/06/1967			
Sediment	:	01/06/1980			
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**
2000-2001	1876	372.400	28/07/2000	0.000		30/01/2001
2001-2002	5776		15/07/2001	0.000		04/04/2002
2002-2003	1680	372.300	11/09/2002	0.000	368.000	08/09/2002
2003-2004	5530	373.800	31/08/2003	0.000	368.000	25/06/2003
2004-2005	4596	375.400	23/08/2004	0.000	368.000	06/10/2004
2005-2006	6845	377.000	07/08/2005	0.000	368.000	31/05/2006
2006-2007	1819	372.200	26/08/2006	0.000	368.000	27/06/2006
2007-2008	234.4	368.000	23/03/2008	0.000	368.000	15/03/2008
2008-2009	209.6	369.700	11/04/2009	4.960	368.000	11/01/2009
2009-2010	1068	368.000	04/10/2009	0.000	368.000	03/09/2009
2010-2011	1491	369.700	22/09/2010	0.000	368.000	26/10/2010
2011-2012	9358	380.500	08/09/2011	0.000	369.000	11/06/2011
2012-2013	3737	374.200	12/08/2012	71.18	368.000	30/07/2012
2013-2014	225.0	369.700	25/09/2013	95.00	369.300	17/09/2013
2014-2015	4480	374.800	07/08/2014	0.000	368.000	21/07/2014
2015-2016	216.0	368.000	26/08/15	10.42	368.000	02/06/15

Stage Discharge Sheet for Narmada at Bijora for the period 2018-19

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	415.300	3743	*	414.300	4026	*	420.550	7204	*	422.450	3743	*	421.950	7487	*	420.700	7699	*
2	415.350	3779	*	414.300	3602	*	420.550	7204	*	422.550	4590	*	421.900	7487	*	420.700	7557	*
3	415.250	3779	*	414.300	3708	*	420.550	7204	*	422.600	7487	*	421.850	7557	*	420.700	7557	*
4	415.200	3779	*	414.350	3532	*	420.550	7204	*	422.600	7487	*	421.800	7557	*	420.650	7557	*
5	415.150	3779	*	414.400	3602	*	420.550	7204	*	422.550	7487	*	421.750	3779	*	420.600	7487	*
6	415.100	3743	*	414.450	3637	*	420.550	7204	*	422.500	7487	*	421.700	3779	*	420.550	7487	*
7	415.050	3779	*	414.450	3673	*	420.500	7204	*	422.500	7487	*	421.650	3779	*	420.550	7063	*
8	415.000	3779	*	414.450	3602	*	420.850	7204	*	422.500	7487	*	421.600	3814	*	420.500	6757	*
9	414.950	3779	*	414.450	3532	*	421.150	3779	*	422.600	7557	*	421.550	3814	*	420.500	7063	*
10	414.900	3779	*	419.500	3673	*	421.450	7628	*	422.350	7416	*	421.500	7487	*	420.500	6922	*
11	414.850	3637	*	414.550	3673	*	421.600	7628	*	422.600	7487	*	421.400	7628	*	420.500	7065	*
12	414.800	3673	*	414.800	3637	*	421.700	7628	*	422.550	7487	*	421.350	7487	*	420.450	7063	*
13	414.800	3673	*	415.000	3602	*	421.850	7628	*	422.550	7487	*	421.250	7628	*	420.450	6992	*
14	414.800	3673	*	415.300	3567	*	422.100	7557	*	422.600	7487	*	421.250	7487	*	420.350	6992	*
15	414.750	3673	*	415.600	3532	*	422.750	7487	*	422.600	7487	*	421.200	7628	*	420.400	6992	*
16	414.750	3743	*	415.900	3779	*	422.100	7487	*	422.600	7487	*	421.200	7487	*	420.400	6957	*
17	414.700	3637	*	416.250	3743	*	422.200	7487	*	422.600	7487	*	421.150	7628	*	420.400	6957	*
18	414.650	3637	*	416.750	368.1	*	422.200	7487	*	422.600	7487	*	421.100	7628	*	420.350	6631	*
19	414.650	3602	*	417.050	3637	*	422.150	7487	*	422.550	7487	*	421.050	7487	*	420.350	6957	*
20	414.600	3602	*	417.200	3637	*	422.200	7487	*	422.500	7487	*	421.100	7628	*	420.300	6992	*
21	414.550	3637	*	417.400	3637	*	422.350	7487	*	422.450	7487	*	421.100	7573	*	420.300	6957	*
22	414.500	3673	*	417.650	3637	*	422.300	7487	*	422.400	7487	*	420.950	7663	*	420.250	3531	*
23	414.450	3567	*	417.900	3708	*	422.200	7487	*	422.350	7487	*	420.900	7628	*	420.200	3496	*
24	414.400	3602	*	419.400	4202	*	422.100	7487	*	422.300	7487	*	420.900	7628	*	420.150	3461	*
25	414.400	3602	*	419.200	7275	*	422.050	7487	*	422.300	7487	*	420.850	7734	*	420.150	6922	*
26	414.350	3143	*	419.950	7275	*	422.150	7487	*	422.300	7487	*	420.800	7381	*	420.100	6992	*
27	414.300	3708	*	420.100	7275	*	422.200	7487	*	422.250	7487	*	420.800	7689	*	420.100	6992	*
28	414.300	3602	*	420.400	7240	*	422.300	7487	*	422.200	7487	*	420.750	7699	*	420.100	6992	*
29	414.300	3673	*	420.450	7204	*	422.550	4910	*	422.100	7487	*	420.750	7204	*	420.050	6992	*
30	414.300	3637	*	420.500	7204	*	422.760	3743	*	422.050	7487	*	420.750	7699	*	420.050	6997	*
31				420.560	7204	*	422.450	3708	*				420.750	7593	*			
Ten-Daily Mean																		
I Ten-Daily	415.125	3772		414.895	3659		420.725	6904		422.520	6823		421.725	5654		420.595	7315	
II Ten-Daily	414.735	3655		415.840	3318		422.085	7536		422.575	7487		421.205	7572		420.395	6960	
III Ten-Daily	414.385	3584		419.410	5987		422.310	6569		422.270	7487		420.845	7590		420.145	5933	
Monthly																		
Min.	414.300	3143		414.300	368.1		420.500	3708		422.050	3743		420.750	3779		420.050	3461	
Max.	415.350	3779		420.560	7275		422.760	7628		422.600	7557		421.950	7734		420.700	7699	
Mean	414.748	3670		416.802	4375		421.726	6989		422.455	7266		421.245	6960		420.378	6736	

Annual Runoff in MCM = 166632 Annual Runoff in mm = 11444

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)

Note:Missing values ignored while arriving at Annual Runoff

Stage Discharge Sheet for Narmada at Bijora for the period 2018-19

Day	Dec			Jan			Feb			Mar			Apr			May		
	W.L	Q		WL	Q		WL	Q		WL	Q		WL	Q		WL	Q	
1	420.000	7063	*	418.800	7275	*	417.650	34226	*	416.650	3743	*	415.750	3743	*	414.700	3743	*
2	419.950	7134	*	418.750	7204	*	417.650	3673	*	416.650	3743	*	415.650	3743	*	414.650	3743	*
3	419.950	7204	*	418.700	7204	*	417.600	3673	*	416.600	3743	*	415.600	3708	*	414.600	3743	*
4	419.900	7134	*	418.650	7275	*	417.550	3637	*	416.600	3708	*	415.500	3708	*	414.600	3708	*
5	419.850	7204	*	418.600	7275	*	417.550	3673	*	416.550	3708	*	415.450	3743	*	414.550	3708	*
6	419.800	7204	*	418.550	3637	*	417.500	3673	*	416.500	3743	*	415.400	3779	*	414.550	3743	*
7	419.750	7275	*	418.500	3673	*	417.500	3673	*	416.450	3814	*	415.400	3743	*	414.500	3743	*
8	419.750	7204	*	418.500	3637	*	417.450	3673	*	416.400	3814	*	415.350	3743	*	414.450	3743	*
9	419.700	7275	*	418.450	3637	*	417.400	3673	*	416.350	3708	*	415.350	3743	*	414.450	3743	*
10	419.650	7169	*	418.400	3673	*	417.350	3673	*	416.300	3708	*	415.350	3708	*	414.400	3743	*
11	419.650	7275	*	418.350	3637	*	417.350	3673	*	416.250	3743	*	415.300	3708	*	414.350	3743	*
12	419.650	7204	*	418.300	3673	*	417.300	3673	*	416.200	3743	*	415.300	3531	*	414.300	3743	*
13	419.600	7204	*	418.300	3673	*	417.250	3673	*	416.200	3708	*	415.250	3743	*	414.250	3708	*
14	419.600	7134	*	418.250	3637	*	417.200	3673	*	416.150	3708	*	415.200	3743	*	414.200	3743	*
15	419.550	6569	*	418.200	3673	*	417.200	3673	*	416.100	3743	*	415.150	3743	*	414.150	3743	*
16	419.550	7204	*	418.150	3673	*	417.150	3673	*	416.100	3743	*	415.100	3708	*	414.100	3673	*
17	419.500	7204	*	418.150	3637	*	417.100	3673	*	416.050	3708	*	415.100	3743	*	414.050	3743	*
18	419.500	7204	*	418.100	3637	*	417.100	3673	*	416.050	3743	*	415.050	3673	*	414.000	3673	*
19	419.450	7204	*	418.050	3637	*	417.050	3673	*	416.000	3743	*	415.050	3673	*	413.950	3673	*
20	419.400	7275	*	418.050	3637	*	417.000	3637	*	416.000	3743	*	415.000	3673	*	413.900	3673	*
21	419.350	7169	*	418.000	3637	*	417.000	3643	*	416.000	3708	*	415.000	3708	*	413.850	3673	*
22	419.300	7275	*	417.950	3567	*	416.950	3708	*	415.950	3743	*	414.950	3673	*	413.800	3743	*
23	419.250	7345	*	417.950	3637	*	416.850	3708	*	415.950	3743	*	414.950	3743	*	413.800	3743	*
24	419.200	7275	*	417.900	3637	*	416.800	3708	*	415.950	3743	*	414.900	3743	*	413.750	3743	*
25	419.150	7204	*	417.900	3637	*	416.750	3743	*	415.950	3708	*	414.850	3743	*	413.700	3743	*
26	419.100	7275	*	417.850	3602	*	416.750	3708	*	415.900	3708	*	414.850	3743	*	413.650	3743	*
27	419.050	7275	*	417.850	3637	*	416.700	3708	*	415.900	3708	*	414.800	3743	*	413.600	3743	*
28	419.000	7240	*	417.800	3637	*	416.700	3708	*	415.850	3708	*	414.750	3743	*	413.550	3743	*
29	418.950	7275	*	417.750	3637	*				415.850	3708	*	414.750	3743	*	413.500	3637	*
30	418.900	7275	*	417.750	3673	*				415.800	3743	*	414.700	3743	*	413.500	3602	*
31	418.850	7275	*	417.700	3673	*				415.800	3743	*				413.450	3708	*
Ten-Daily Mean																		
I Ten-Daily	419.830	7187		418.590	5449		417.520	6725		416.505	3743		415.480	3736		414.545	3736	
II Ten-Daily	419.545	7148		418.190	3651		417.170	3669		416.110	3733		415.150	3694		414.125	3712	
III Ten-Daily	419.100	7262		417.855	3634		416.813	3704		415.900	3724		414.850	3733		413.650	3711	
Monthly																		
Min.	418.850	6569		417.700	3567		416.700	3637		415.800	3708		414.700	3531		413.450	3602	
Max.	420.000	7345		418.800	7275		417.650	34226		416.650	3814		415.750	3779		414.700	3743	
Mean	419.479	7201		418.200	4225		417.193	4771		416.163	3733		415.160	3721		414.092	3719	

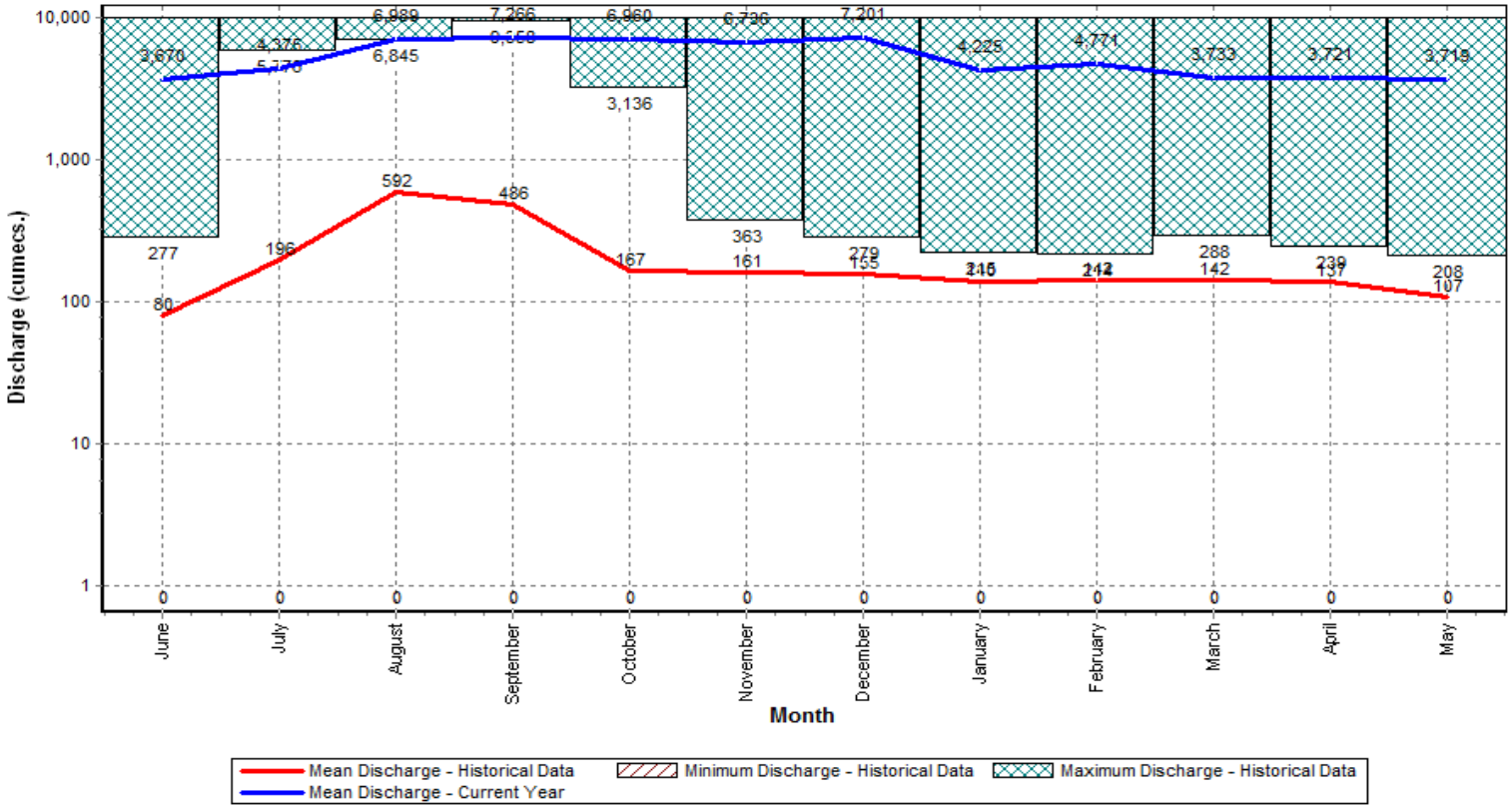
Peak Computed Discharge = 34226 cumecs on 01/02/2019 Corres. Water Level :417.65 m
Lowest Computed Discharge = 368.1 cumecs on 18/07/2018 Corres. Water Level :416.75 m

Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(M.S.L) in m *:Computed Discharge #:Discarded Discharge (values changed as per rating curve)
Note:Missing values ignored while arriving at Annual Runoff

Histogram- Hydrograph for Water Year : 2018-19 (Data considered : 2000-2019)

Station Name : Narmada at Bijora (NA) Division : DDPC, Bhopal

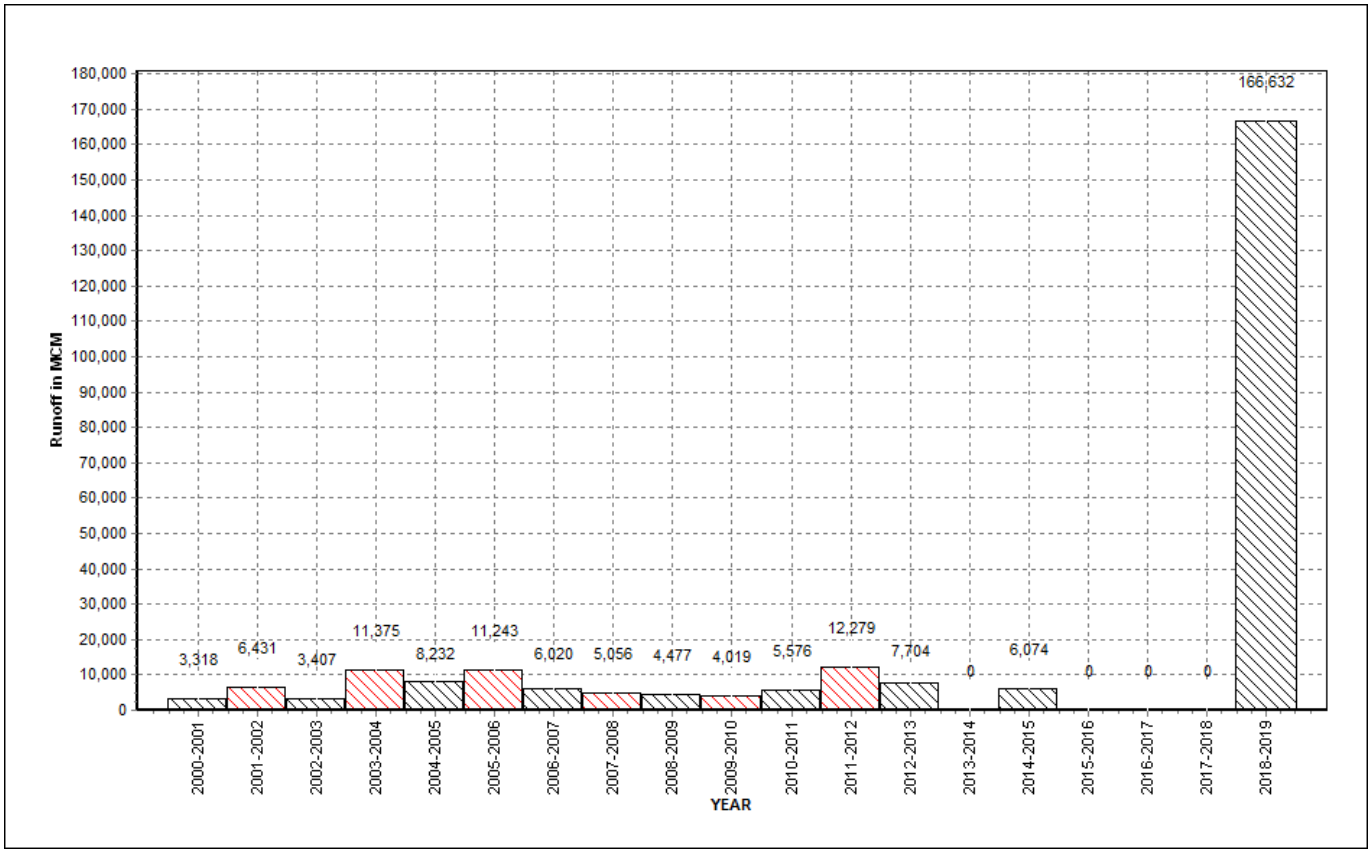
Local River : Narmada Sub-Division : SDDPC, Bhopal



Annual Runoff Values for the period: (2000– 2019)

Station Name : Narmada at Bijora (NA) Division : DDPC, Bhopal

Local River : Narmada Sub-Division : SDDPC, Bhopal



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

Monthly Average Runoff for the year (2018-19)

Station Name : Narmada at Bijora (NA)

Division : DDPC, Bhopal

Local River : Narmada

Sub-Division : SDDPC, Bhopal