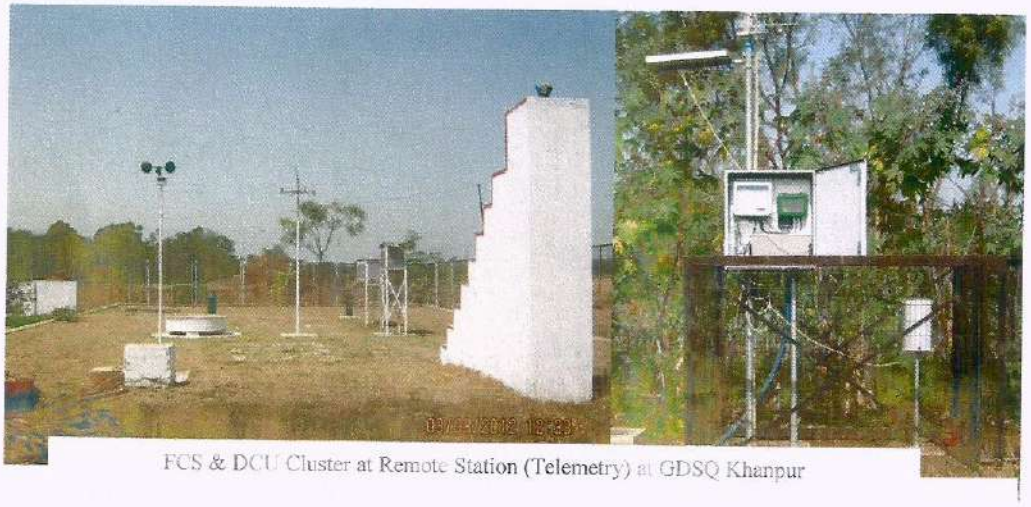
सत्यमेव जयते

जल वार्षिकी
WATER YEAR BOOK
2016 – 17

माही, साबरमती एवं अन्य पश्चिम प्रवाही नदियाँ
(लूनी, बनास, शेत्रुन्जी, भादर, मच्छु रूपेन और मच्छुंन्द्री)

MAHI, SABARMATI & OTHER WEST FLOWING RIVERS
(Luni, Banas, Shetrunji, Bhadar, Machhu, Rupen & Machhundri)



FCS & DCU Cluster at Remote Station (Telemetry) at GDSQ Khanpur

केन्द्रीय जल आयोग
नर्मदा व तापी बेसिन संगठन
जल विज्ञानीय प्रेक्षण परिमण्डल
गाँधीनगर (गुजरात)

Central Water Commission,
Narmada & Tapi Basin Organization,
Hydrological Observation Circle,
Gandhinagar (Gujarat)

NOVEMBER, 2017

आमुख

राष्ट्रीय जल नीति में मानकीकृत राष्ट्रीय सूचना प्रणाली डेटा वेस और डेटा वैंकों के एक नेटवर्क के साथ गुणवत्ता के आँकड़े उपलब्ध कराने और प्रसंस्करण क्षमताओं में सुधार के लिए मौजूदा केन्द्रीय और राज्य स्तरीय ऐजेन्सियों के एकीकरण की आवश्यकता पर वल दिया गया है। जल के वहु -उपयोगी स्वरूप एवं उसकी वढती मांग को पूरा करने हेतु संसाधनों के अनुकूलतम नियोजन के संदर्भ में संवंधित आँकड़ों का संकलन अतिमहत्वपूर्ण है।

केन्द्रीय जल आयोग, जल संसाधनों के विकास में संलग्न, भारत सरकार, जल संसाधन मंत्रालय के अन्तर्गत देश की एक शीर्षस्थ तकनीकी संस्था है जो जल विज्ञानीय आँकड़ों के एकत्रीकरण से लेकर परियोजनाओं का मूल्यांकन, अभिकल्पन, प्रवोधन तथा परिचालन करती है।

जल विज्ञानीय प्रेक्षण परिमंडल गांधीनगर, नर्मदा तापी वेसिन संगठन के अन्तर्गत केन्द्रीय जल आयोग की एक क्षेत्रीय ईकाई है जिसके अन्तर्गत गुजरात मध्य प्रदेश महाराष्ट्र राजस्थान दादरा नगर हवेली (केन्द्र शासित प्रदेश) एवं दमन तथा दीव (केन्द्र शासित प्रदेश) के भाग से होकर पश्चिम की ओर वहने वाली **17** नदी वेसिनों के अधिसूचित महत्वपूर्ण स्थलों पर जल के सतही प्रवाह के आँकड़े एकत्रित किए जाते हैं ।

माही मंडल गांधीनगर द्वारा माही, सावरमती एवं अन्य पश्चिम प्रवाही नदियों, लूनी, वनास, शेत्रुन्जी, भादर, मच्छु, रूपेन एवं मच्छुंन्द्री पर, वर्तमान में, **23** स्थलों पर सतही प्रवाह का प्रेक्षण किया जा रहा है। इनके आँकड़ें इस वार्षिकी **2016-17** में संकलित किए गए हैं।

जल वर्ष **2005-06** से जल वार्षिकी का प्रकाशन केन्द्रीय जल आयोग द्वारा निर्धारित स्वरूप (SWDES) में किया जा रहा है। इस वार्षिकी में सतही प्रवाह के आँकड़ों के साथ - साथ वेसिन से संवंधित सूचनाएँ जैसे कि जलवायु, भूगर्भ विज्ञान, कृषि, भूमि, आदि भी दिये गए हैं।

इस वार्षिकी में दी गयी सूचना एवं संकलित आँकड़े उन सभी के लिये उपयोगी होंगे जो जल संसाधन से संवंधित किसी भी क्षेत्र में रूचि रखते हैं, ऐसी आशा है। इसे और उपयोगी वनाने हेतु सुझाव आमंत्रित हैं।

वार्षिकी में प्रकाशित आँकड़ों के संकलन विश्लेपण तथा प्रकाशन हेतु नर्मदा - तापी वेसिन संगठन के अधीनस्थ जल विज्ञानीय प्रेक्षण परिमंडल, गांधीनगर एवं माही मंण्डल ,गांधीनगर के अधिकारियों एवं कर्मचारियों ने जिस समर्पण एवं लगन से कार्य संपादित किया है, वह प्रशंसनीय है।

गांधीनगर (गुजरात)
नवम्वर, **2017**

(विमल कुमार)
अधीक्षण अभियंता

Preface

The National Water Policy stresses the need for a standardised national information system with a network of data base and data banks, integrating the existing Central and State agencies for providing quality data and improving the processing capabilities. Collection and compilation of data assumes greater importance in the context of optimal resource planning to meet the ever increasing demand for water in its multi-facetted use.

Central Water Commission is an apex organization of the country concerned with planned development and monitoring in water resources sector. CWC has for long been maintaining a Hydrological Observation & Flood forecasting network, which covers almost all the interstate rivers of India.

Hydrological Observation (HO) Circle, Gandhinagar, a field unit in Narmada Tapi Basin Organization of the Central Water Commission, is entrusted with the collection of surface water data (Hydrological Observation) of 17 river basins flowing through Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Daman & Diu (UT) and DNH (UT).

The Mahi Division, headquartered at Gandhinagar, under HO Circle, is at present, carrying out hydrological observations at 23 sites on river Mahi, Sabarmati & other west flowing rivers viz. Luni, Banas, Shetrunji, Machhu, Rupen, Bhadar and Machhundri, which have been compiled in this Water Year Book. It also includes trend analysis of annual surface runoff for these basins.

The publication of Water Year Book in SWDES format has been started since the water year 2005-06 as per guidelines issued by Central Water Commission, New Delhi. This Year Book not only provides the hydrological data but also provides general information about geology, climate, agriculture, soil, cities/towns, major and medium projects in the basin, etc. It also includes trend analysis of annual surface runoff for these basins.

It is hoped that the information and data compiled herein will be useful to all those concerned with any field related with water resources of the country. Comments and suggestions, if any, on the Water Year Book are most welcome.

The efforts put in by all the concerned officers and staffs of Mahi Division and Hydrological Observation Circle, Gandhinagar under NTBO, Central Water Commission is gratefully acknowledged.

Vimal

Gandhinagar (Gujarat)
November, 2017

(Vimal Kumar)
Superintending Engineer

C o n t e n t s

Section No	Particulars	Page No
	List of Plates & Figures	ix
	Abbreviations & Symbols	xi
1.0	**Introduction**	**1**
1.1	General	1
1.2	Jurisdiction map of Mahi Division, CWC, Gandhinagar	3
2.0	**Basin Description**	4
2.1	Mahi Basin	4
2.2	Sabarmati Basin	15
2.3	Luni Basin	26
2.4	Banas Basin	32
2.5	Shetrunji Basin	39
2.6	Bhadar Basin	45
2.7	Machchhu Basin	51
2.8	Rupen Basin	57
2.9	Machhundri Basin	61
3.0	Hydrological Observations by the State Governments	63
3.1	Methodology Stream flow measurement	67
3.1.1	Gauge measurement	67
3.1.2	Discharge measurement	67
3.1.3	Explanatory note	69
3.1.4	Method of presentation	70
4.0	**Hydrological data**	70
4.1	**Mahi Basin**	**72-125**
4.1.1	**Mahi at Khanpur**	**72-80**
	History sheet	72
	Stage discharge data for the period 2016-2017	73
	Stage discharge curves	75
	Pre-Monsoon and post-Monsoon X-section for the water year	77
	Annual runoff values for the period 1979-2017	78
	Monthly average runoff for the period 1979-2017	79
	Monthly average runoff for the water year	79
	Water level vs time graph of I, II & III highest peaks for the water year	80
4.1.2	**Anas at Chakaliya**	**81-88**
	History sheet	81
	Stage discharge data for the period 2016-2017	82
	Stage discharge curve	84
	Pre-Monsoon and post-Monsoon X-section for the water year	85

	Annual runoff values for the period 1991-2017	86
	Monthly average runoff for the period 1991-2017	87
	Monthly average runoff for the water year	87
	Water level vs time graph of I, II & III highest peaks for the water year	88
4.1.3	**Mahi at Paderdibadi**	**89-98**
	History sheet	89
	Stage discharge data for the period 2016-17	91
	Stage discharge curve	93
	Pre-Monsoon and post-Monsoon X-section for the water year	95
	Annual runoff values for the period 1978-2017	96
	Monthly average runoff for the period 1978-2017	97
	Monthly average runoff for the water year	97
	Water level vs time graph of I, II & III highest peaks for the water year	98
4.1.4	**Som at Rangeli**	**97-108**
	History sheet	99
	Stage discharge data for the period 2016-17	101
	Stage discharge curve	103
	Pre-Monsoon and post-Monsoon X-section for the water year	105
	Annual runoff values for the period 1979-2017	106
	Monthly average runoff for the period 1979-2017	107
	Monthly average runoff for the water year	107
	Water level vs time graph of I, II & III highest peaks for the water year	108
4.1.5	**Jakham at Dhariawad**	**109-116**
	History sheet	109
	Stage discharge data for the period 2016-2017	110
	Stage discharge curve	112
	Pre-Monsoon and post-Monsoon X-section for the water year	113
	Annual runoff values for the period 1988-2017	114
	Monthly average runoff for the period 1988-2017	115
	Monthly average runoff for the water year	115
	Water level vs time graph of I, II & III highest peaks for the water year	116
4.1.6	**Mahi at Mataji**	**117-125**
	History sheet	117
	Stage discharge data for the period 2016-2017	118
	Stage discharge curve	120
	Pre-Monsoon and post-Monsoon X-section for the water year	122
	Annual runoff values for the period 1982-2017	123
	Monthly average runoff for the period 1982-2017	124

	Monthly average runoff for the water year	124
	Water level vs time graph of I, II & III highest peaks for the water year	125
4.2	**Sabarmati Basin**	**126-174**
4.2.1	**Sabarmati at Vautha**	**126-133**
	History sheet	126
	Stage discharge data for the period 2016-2017	127
	Stage discharge curve	129
	Pre-Monsoon and post-Monsoon X-section for the water year	130
	Annual runoff values for the period 2001-2017	131
	Monthly average runoff for the period 2001-2017	132
	Monthly average runoff for the water year	132
	Water level vs time graph of I, II & III highest peaks for the water year	133
4.2.2	**Sabarmati at Kheda**	**134-141**
	History sheet	134
	Stage discharge data for the period 2016-2017	135
	Stage discharge curve	137
	Pre-Monsoon and post-Monsoon X-section for the water year	138
	Annual runoff values for the period 1998-2017	139
	Monthly average runoff for the period 1998-2017	140
	Monthly average runoff for the water year	140
	Water level vs time graph of I, II & III highest peaks for the water year	141
4.2.3	**Watrak at Ratanpur**	**142-149**
	History sheet	142
	Stage discharge data for the period 2016-2017	143
	Stage discharge curve	145
	Pre-Monsoon and post-Monsoon X-section for the water year	146
	Annual runoff values for the period 1991-2017	147
	Monthly average runoff for the period 1991-2017	148
	Monthly average runoff for the water year	148
	Water level vs time graph of I, II & III highest peaks for the water year	149
4.2.4	**Sabarmati at Derol Bridge**	**150-157**
	History sheet	150
	Stage discharge data for the period 2016-2017	151
	Stage discharge curve	153
	Pre-Monsoon and post-Monsoon X-section for the water year	154
	Annual runoff values for the period 1992-2017	155
	Monthly average runoff for the period 1992-2017	156
	Monthly average runoff for the water year	156
	Water level vs time graph of I, II & III highest peaks for the water	157

	year	
4.2.5	**Sabarmati at Kheroj**	**158-166**
	History sheet	158
	Stage discharge data for the period 2016-2017	160
	Stage discharge curve	162
	Pre-Monsoon and post-Monsoon X-section for the water year	163
	Annual runoff values for the period 1992-2017	164
	Monthly average runoff for the period 1992-2017	165
	Monthly average runoff for the water year	165
	Water level vs time graph of I, II & III highest peaks for the water year	166
4.2.6	**Wakal at Jotasan**	**167-174**
	History sheet	167
	Stage discharge data for the period 2016-2017	168
	Stage discharge curve	170
	Pre-Monsoon and post-Monsoon X-section for the water year	171
	Annual runoff values for the period 1995-2017	172
	Monthly average runoff for the period 1995-2017	173
	Monthly average runoff for the water year	173
	Water level vs time graph of I, II & III highest peaks for the water year	174
4.3	**Luni Basin**	**175-191**
4.3.1	**Luni at Gandhav**	**175-182**
	History sheet	175
	Stage discharge data for the period 2016-2017	176
	Stage discharge curve	178
	Pre-Monsoon and post-Monsoon X-section for the water year	179
	Annual runoff values for the period 1974-2017	180
	Monthly average runoff for the period 1974-2017	181
	Monthly average runoff for the water year	181
	Water level vs time graph of I, II & III highest peaks for the water year	182
4.3.2	**Luni at Balotra**	**183-191**
	History sheet	183
	Stage discharge data for the period 2016-2017	185
	Stage discharge curve	187
	Pre-Monsoon and post-Monsoon X-section for the water year	188
	Annual runoff values for the period 1990-2017	189
	Monthly average runoff for the period 1990-2017	190
	Monthly average runoff for the water year	190
	Water level vs time graph of I, II & III highest peaks for the water year	191

4.4	**Banas Basin**	**192-224**
4.4.1	**Banas at Kamalpur**	192-200
	History sheet	192
	Stage discharge data for the period 2016-2017	194
	Stage discharge curve	196
	Pre-Monsoon and post-Monsoon X-section for the water year	197
	Annual runoff values for the period 1971-2017	198
	Monthly average runoff for the period 1971-2017	199
	Monthly average runoff for the water year	199
	Water level vs time graph of I, II & III highest peaks for the water year	200
4.4.2	**Banas at Chitrasani**	201-208
	History sheet	201
	Stage discharge data for the period 2016-2017	202
	Stage discharge curve	204
	Pre-Monsoon and post-Monsoon X-section for the water year	205
	Annual runoff values for the period 1990-2017	206
	Monthly average runoff for the period 1990-2017	207
	Monthly average runoff for the water year	207
	Water level vs time graph of I, II & III highest peaks for the water year	208
4.4.3	**Banas at Sarotry**	209-216
	History sheet	209
	Stage discharge data for the period 2016-2017	210
	Stage discharge curve	212
	Pre-Monsoon and post-Monsoon X-section for the water year	213
	Annual runoff values for the period 1989-2017	214
	Monthly average runoff for the period 1989-2017	215
	Monthly average runoff for the water year	215
	Water level vs time graph of I, II & III highest peaks for the water year	216
4.4.4	**Banas at Aburoad**	217-224
	History sheet	217
	Stage discharge data for the period 2016-2017	218
	Stage discharge curve	220
	Pre-Monsoon and post-Monsoon X-section for the water year	221
	Annual runoff values for the period 1989-2017	222
	Monthly average runoff for the period 1989-2017	223
	Monthly average runoff for the water year	223
	Water level vs time graph of I, II & III highest peaks for the water year	224
4.5	**Shetrunji Basin**	**225-233**
4.5.1	**Shetrunji at Lowara**	**225-233**
	History sheet	225
	Stage discharge data for the period 2016-2017	227

	Stage discharge curve	229
	Pre-Monsoon and post-Monsoon X-section for the water year	230
	Annual runoff values for the period 1971-2017	231
	Monthly average runoff for the period 1971-2017	232
	Monthly average runoff for the water year	232
	Water level vs time graph of I, II & III highest peaks for the water year	233
4.6	**Bhadar Basin**	**234-242**
4.6.1	**Bhadar at Ganod**	**234-242**
	History sheet	234
	Stage discharge data for the period 2016-2017	236
	Stage discharge curve	238
	Pre-Monsoon and post-Monsoon X-section for the water year	239
	Annual runoff values for the period 1971-2017	240
	Monthly average runoff for the period 1971-2017	241
	Monthly average runoff for the water year	241
	Water level vs time graph of I, II & III highest peaks for the water year	242
4.7	**Machchhu Basin**	**243-251**
4.7.1	**Machhu at Gungan**	**243-251**
	History sheet	243
	Stage discharge data for the period 2016-2017	245
	Stage discharge curve	247
	Pre-Monsoon and post-Monsoon X-section for the water year	248
	Annual runoff values for the period 1971-2017	249
	Monthly average runoff for the period 1971-2017	250
	Monthly average runoff for the water year	250
	Water level vs time graph of I, II & III highest peaks for the water year	251
4.8	**Rupen Basin**	**252-259**
4.8.1	**Rupen at Sapawada**	**252-259**
	History sheet	252
	Stage discharge data for the period 2016-2017	254
	Pre-Monsoon and post-Monsoon X-section for the water year	256
	Annual runoff values for the period 1990-2017	257
	Monthly average runoff for the period 1990-2017	258
	Monthly average runoff for the water year	258
	Water level vs time graph of I, II & III highest peaks for the water year	259
4.9	**Machhundri Basin**	**260-267**
4.9.1	**Machhundri at Una**	**260-267**
	History sheet	260
	Stage discharge data for the period 2016-2017	261
	Stage discharge curve	263
	Pre-Monsoon and post-Monsoon X-section for the water year	264

	Monthly average runoff for the water year	265
	Monthly average runoff for the water year	266
	Water level vs time graph of I, II & III highest peaks for the water year	267

List of plates and Figures

Plate-1	Jurisdiction map of Mahi Division, CWC, Gandhinagar	3
Plate -2.1.1	River Basin map of Mahi Basin	13
Plate -2.1.2	Line diagram of River Basin of Mahi Basin	14
Plate -2.2.1	River Basin map of Sabarmati Basin	24
Plate -2.2.2	Line diagram of River Basin of Sabarmati Basin	25
Plate -2.3.1	River Basin map of Luni Basin	30
Plate -2.3.2	Line diagram of River Basin of Luni Basin	31
Plate -2.4.1	River Basin map of Banas Basin	37
Plate -2.4.2	Line diagram of River Basin of Banas Basin	38
Plate -2.5.1	River Basin map of Shetrunji Basin	43
Plate -2.5.2	Line diagram of River Basin of Shetrunji Basin	44
Plate -2.6.1	River Basin map of Bhadar Basin	49
Plate -2.6.2	Line diagram of River Basin of Bhadar Basin	50
Plate -2.7.1	River Basin map of Machchhu Basin	55
Plate -2.7.2	Line diagram of River Basin of Machchhu Basin	56
Plate -2.8.1	River Basin map of Rupen Basin	59
Plate -2.8.2	Line diagram of River Basin of Rupen Basin	60
Plate-2.9.1	River Basin map of Machhundri River	62

Abbreviations and symbols

Av	:	Average
Ann	:	Annual
A.G.R.	:	Automatic Gauge Recorder
C	:	Centigrate
Cum	:	Cubic meter
Cumec	:	Cubic meter per second
c/s	:	Cross section
C.W.C.	:	Central Water Commission
D	:	Days
Dis	:	Discharge
F	:	Float Observation
F.F.	:	Flood Forecasting
G	:	Gauge
GD	:	Gauge and Discharge
GDS	:	Gauge, Discharge and Sediment
GDWQ	:	Gauge, Discharge and Water Quality
GDSWQ	:	Gauge, Discharge, Sediment and Water Quality
GTS	:	Great Trigonometrical Survey
hRs.	:	HouRs
IWYB	:	Integrated Water Year Book
WYB	:	Water Year Book
km	:	Kilo meter
M	:	Million
m	:	Meter
mm	:	milli meter
m^3/s	:	Cubic meter per second
Mm3 / MCM	:	Million Cubic meter
Max.	:	Maximum
Min.	:	Minimum
m.s.l.	:	Mean sea level
MDN	:	Mahi Division, CWC, Gandhinagar
neg.	:	Negligible
NNW	:	National Net Work
R.L.	:	Reduced Level

R.D.	:	Reduced Distance
R.Days	:	Remaining days
R.C.C.	:	Reinforced Cement Concrete
sq km	:	Square Kilometer
TDN	:	Tapi Division, CWC, Surat
WQ	:	Water Quality
W.L.	:	Water Level
W.Year	:	Water Year
WDN	:	Water Resources Investigation Division, Ahmedabad
WRI Circle	:	Water Resources Investigation Circle
80 Key	:	80 Key Hydrological Station Scheme
163 Key	:	163 Key Hydrological Station Scheme
0, ‘ . “	:	Degree (30^0) Minutes(56’) Seconds (35”)
*	:	Estimated Discharge
#	:	Discarded and estimated discharge

1.0 I n t r o d u c t i o n

1.1 General

Central Water commission is conducting hydrological observations on major west flowing River Basins under various schemes viz national network, 80-key stations, 163- key stations , 2701 DWRIS Plan and flood forecasting. This water year book presents the data of 23 hydrological observation stations for the water year 2016-17 in Mahi, Sabarmati, Luni, Banas, Shetrunji, Bhadar, Machhu, Rupen and Machhundri basins. The data of 23 sites which are included in this book are collected by Mahi Division, Central Water Commission, Gandhinagar under Hydrological Observation Circle, Gandhinagar. Jurisdiction map of Mahi Division, CWC, Gandhinagar is enclosed at **Plate-1**.

The schemwise distribution of sites is shown in the following table.

Schemewise distribution of sites

National net work					
Sr.no.	Site	River	Basin	Code	Type
1	Mataji	Mahi	Mahi	01 02 13 001	GDSWQ
2	Kamalpur	Banas	Banas	01 02 02 007	GDSWQ
3	Lowara	Shetrunji	Shetrunji	01 02 09 001	GDSWQ
4	Ganod	Bhadar	Bhadar	01 02 07 001	GDSWQ
5	Gungan	Machhu	Machhu	01 02 03 001	GD
6	Gandhav	Luni	Luni	01 02 01 002	GD
80 key hydrological stations					
Sr.no.	Site	River	Basin	Code	Type
1	Rangeli	Som	Mahi	01 02 13 005	GDWQ
2	Khanpur	Mahi	Mahi	01 02 13 012	GDSWQ
3	Paderdibadi	Mahi	Mahi	01 02 13 006	GDSWQ

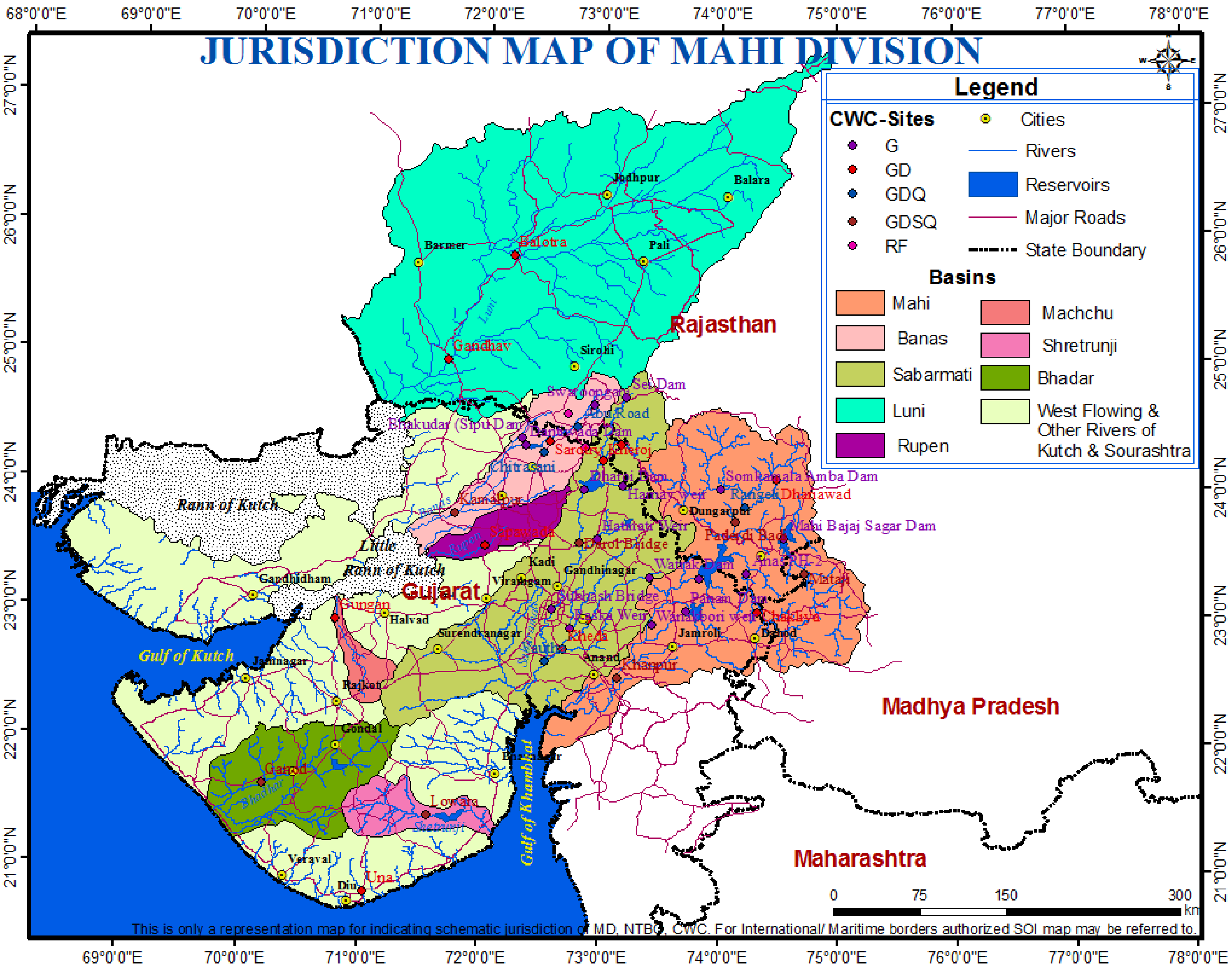
Flood forecasting

Sr.no.	Site	River	Basin	Code	Type
1	Dhariwad	Jakham	Mahi	01 02 13 004	GD
2	Kheda	Watrak	Sabarmati	01 02 12 012	GD
3	Ratanpur	Watrak	Sabarmati	01 02 12 010	GD
4	Kheroj	Sabarmati	Sabarmati	01 02 12 003	GD
5	Jotasan	Wakal	Sabarmati	01 02 12 001	GD
6	Derol Bridge	Sabarmati	Sabarmati	01 02 12 006	GDSWQ
7	Chitrasani	Balaram	Banas	01 02 02 004	GDWQ
8	Sarotry	Banas	Banas	01 02 02 003	GD
9	Abu road	Banas	Banas	01 02 02 002	GDWQ

163 key hydrological stations

Sr.no.	Site	River	Basin	Code	Type
1	Chakaliya	Anas	Mahi	01 02 13 007	GD
2	Balotra	Luni	Luni	01 02 01 001	GD
3	Sapawada	Rupen	Rupen	01 02 04 001	GD
4	Vautha	Sabarmati	Sabarmati	0102 12 013	GDWQ
2701 DWRIS					
1	Una	Machhundri	Machhundri	01 02 14 001	GD

Plate 1



JURISDICTION MAP OF MAHI DIVISION
Legend
CWC-Sites
G
GD
GDQ
GDSQ
RF
Cities
Rivers
Reservoirs
Major Roads
State Boundary
Basins
Mahi
Banas
Sabarmati
Luni
Rupen
Machchu
Shretrunji
Bhadar
West Flowing & Other Rivers of Kutch & Sourashtra
Rajasthan
Gujarat
Madhya Pradesh
Maharashtra
Gulf of Kutch
Gulf of Khambhat
Rann of Kutch
Little Rann of Kutch
Jodhpur
Balara
Barmer
Balotra
Pali
Gandhav
Sirohi
Dungarpur
Mahi Bajaj Sagar Dam
Gandhinagar
Kadi
Viramgam
Surendranagar
Halvad
Gandhidham
Jamnagar
Rajkot
Gondal
Veraval
Diu
Una
Lowara
Anand
Khanpur
Jamroli
Dahod
0 75 150 300 km
68°0'0"E 69°0'0"E 70°0'0"E 71°0'0"E 72°0'0"E 73°0'0"E 74°0'0"E 75°0'0"E 76°0'0"E 77°0'0"E 78°0'0"E
21°0'0"N 22°0'0"N 23°0'0"N 24°0'0"N 25°0'0"N 26°0'0"N 27°0'0"N
This is only a representation map for indicating schematic jurisdiction of MD, NTBO, CWC. For International/ Maritime borders authorized SOI map may be referred to.

2.0 Description of Various Basins

2.1 Mahi Basin

2.1.1 Geographical description of the Basin

Mahi River is one of the major west flowing inter-state River of India, draining into the gulf of Khambhat. The basin is bound on the north and the north - west by Aravalli hills, on the east by the ridge separating it from the Chambal Basin, on the south by the Vindhyas and on the west by the Gulf of Khambhat. Mahi River originates on the northern slope of Vindhyas at latitude 22^0 35'N and longitude 74^0 58'E near the village of Sardarpur in the Dhar district of Madhya Pradesh at an elevation of 500 m above m.s.l. It has a total length of 583 km and it traverses through the States of Madhya Pradesh, Rajasthan and Gujarat. Total drainage area of Mahi is 34,842 sqkm. Basin map of Mahi basin is enclosed as **Plate -2.1.1**

The State wise distribution of the drainage area is shown in the following table.

Sl.No.	Name of state	River length (km)	Drainage area (sqkm)	Percentage of total
1	Madhya Pradesh	167	6695	19.22
2	Rajasthan	174	16453	47.22
3	Gujarat	242	11694	33.56
	Total	583	34842	100.00

2.1 .2 Description of River system

Initially the river flows northwards through Dhar and Jhabua districts of M.P., then turns left and passes through Ratlam district of M.P. Subsequently turning to north - west, it enters the Banswara district of Rajasthan and flows in south - west directions and thereafter enters the Panchmahal district of Gujarat. Then the river continuously flows in the same direction through Kheda district of Gujarat and finally falls into the Gulf of Khambhat in Arabian sea.

This river receives several tributaries on both the banks, out of which the main tributaries are Som, Anas and Panam.

Som

This is a right bank tributary of Mahi. Som River rises near Som on the eastern slopes of the Aravalli hills in the Udaipur district of Rajasthan at an elevation of 600 m above m.s.l. and

flows in the eastern direction to join the main River Mahi on the right bank 6.3 km upstream of Paderdibadi site in Dungarpur district of Rajasthan. Its total length is about 155 km. The total drainage area of Som is 8707 sqkm Gomti & Jakham are the major right bank sub tributaries of Som.

Anas

This is a left bank tributary of Mahi. Anas River rises near Kalmora on the northern slopes of Vindhyas in Jhabua district in Madhya Pradesh at an elevation of 450 m above m.s.l. and flows in the north - west direction and joins the main River Mahi on left bank in the Dungarpur district in Rajasthan. It has a total length of about 156 km and the total drainage area of 5604 sqkm.

Panam

This is a left bank tributary of Mahi. Panam River rises near Bhadra on northern slopes of the Vindhyas near Jhabua district in Madhya Pradesh at an elevation of about 300 m above m.s.l. and flows in the north - west direction and joins the main River on the left bank in the Panchmahal district of Gujarat. It has a total length of about 127 km and drainage area of about 2470 sqkm.

A line diagram of river system giving information of Mahi basin and its tributaries and sub tributaries etc. indicating location of major structures is enclosed as **Plate -2.1.2.**

2.1.3 Cimatic characterstics

The Mahi Basin experiences 3 marked seasons – Summer (March-May), Monsoon (June-Sep.) & Winter (Oct.-Feb.). From the available data & record, the basin contains two climatic regions, the northern part of the basin comprises sub tropical wet climate (generally basin area occupied by Rajasthan). The major part of basin comprises tropical wet climate, caused mainly due to existence of Vindhyas & the Western ghats. Due to relatively high elevation in forest land, the area of the basin near the origin of the River experiences relatively cooler & moderate rainfall climate which gradually changes to warm & dry climate as the river flows northwards entering into & flowing through Rajasthan. After the river bends south westwards and enters Gujarat, the climate gradually changes towards tropical wet climate again.

Temperature (°C) during year 2016-17

Year	Chakaliya		Mataji		Khanpur		Paderdibadi		Dharaiwad	
	Max. (^{0}C)	Min. (^{0}C)	Max. (^{0}C)	Min. (^{0}C)	Max. (^{0}C)	Min. (^{0}C)	Max. (^{0}C)	Min. (^{0}C)	Max. (^{0}C)	Min. (^{0}C)
2016-17	47	8	46	2	44	10	46	6	45	12

2.1.4 Rainfall

The average rainfall in the Mahi Basin is 785 mm. The Southwest Monsoon sets in by the middle of June and withdraws by the first week of October. About 90 percent of total rainfall is received during the Monsoon months of which 50 percent is received during July and August. Rainfall is mainly influenced by the Southwest Monsoon. The effect is most pronounced in Vadodara lying on the windward side of the Western Ghats. Ratlam also receives similar rainfall, lying between the Arravalli and hill ranges north of Westernghats. Monsoon contributes nearly 91-94% of annual precipitation in Vadodara & Ratlam respectively.

Mean annual rainfall in mm Mahi Basin CWC sites

Name of site	Data available (No of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year	No of rainy days
				2016-17	2016-17
Chakaliya	26	744	20	552.3	33.0
Mataji	28	890	37	1221.74	44
Khanpur	28	935	23	516.8	39
Paderdibadi	32	734	29	748	48
Dharaiwad	28	840	49	1237.7	54
Rangeli	17	755	24	954.9	39
Mahi dam	15	977	24	1109	43
Som kamla amba dam	15	751	26	889.8	39
Kadana dam	16	902	32	1129	42
Anas ph-2	15	758	27	1040.0	35
Panam dam	15	968	31	1015.5	56
Wanakbori weir	15	998	24	928	45

2.1.5 Wind

Average wind speed is the lowest in Udaipur & the highest in Dahod. In general, wind speed is the lowest in post Monsoon period (Oct.-Nov.) & the highest in June. The predominant wind direction is from West in Ratlam & Dahod from Northwest in Udaipur and Southwest in Vadodara. The wind direction remains uniform from post Monsoon till early winter i.e. Oct. – February. Change of direction takes place in March/April. In Ratlam, Vadodara & Dahod the dominant wind direction is from North-East and East respectively during post Monsoon and in winter changes to westerly and south- westerly. In Udaipur, the post Monsoon and winter wind direction is from North & North -West which changes to South-westerly & Westerly during the remaining part of the year.

2.1.6 Geology

Hydro geologically the river basin is categorised by two distinct units viz.:

i. **Consolidated formation**

This hydro geological unit is mainly dominated by basaltic lava flows associated with inter trappean, infratrappean and Archean rock formation represented by phyllites, gneisses, quartzite & granites. Madhya Pradesh, Rajasthan & North eastern parts of Gujarat are mainly underlain by consolidated rocks.

ii. Unconsolidated formation

Ground water occures under water table and unconfined condition in the bed of sand, kankar & gravel that constitutes the alluvial aquifers occurred as discontinuous beds of varying thickness in hard rocks- terrain in the North & Northeastern part of the basin.

The valley-fills, that are having good ground water potential are quite prominent and significant in the hard rock areas in the district of Jhabua, Chittorgarh, Udaipur, Banswara & Panchmahal. The Southern part of the basin is occupied by quaternary, post Miocene and tertiary sediment deposited over a sinking basement between two major structurally controlled lineaments.

2.1.7 Description of the water storage / diversion structures

At present, there are 15 completed major/medium irrigation/multi purpose projects in Mahi Basin.

List of existing projects (State irrigation) in Mahi Basin

Sl. No	Name of project	River	Storage capacity (Mm^3)		Purpose
			Gross	Live	
1	Mahi bajaj sagar	Mahi	2180	1712	Multi-purpose
2	Kadana	Mahi	1542	1203	Multi-purpose
3	Panam	Panam	735.8	679.2	Irrigation / water supply
4	Jakham	Jakham	141.9	131.6	Irrigation
5	Machhan nalla	Machhan	37.91	29.16	Irrigation
6	Wanakbori weir	Mahi	41.884	36.224	Irrigation
7	Jaisamand	Gomti	414.6	296.1	Irrigation / flood control
8	Hadaf	Hadaf	32.26	25.02	Irrigation
9	Kabutary	Kabutary	9.58	8.07	Irrigation
10	Bhadar	Bhadar	46.72	40.06	Irrigation
11	Umaria	Hadaf	13.53	11.67	Irrigation
12	Edalwada	Naleshvar	11.33	10.50	Irrigation
13	Nagalia weir	Jakham	-	-	Irrigation
14	Karmai weir	Karmai	-	-	Irrigation
15	Somkamala amba	Som	126.06	125.83	Irrigation
16	Labriya Dam	Mahi	199.07	135	Irrigation

Salient features of major/important projects viz. Mahi Bajaj Sagar, Kadana reservoir, Wanakbori weir & Panam reservoir are as follows.

Mahi Bajaj Sagar project

This project is located across River Mahi near village Barekhera about 16 km Northeast of Banswara town in Rajasthan. It has a catchment area of 6149 sqkm. The project comprises of a composite dam of earth fill and masonry having crest length of about 2800 m, spillway length 300 m in the River gorge. The maximum height of the earthen dam is 43 m and masonry dam

is 65.5 m. The live storage capacity of reservoir is 1712 Mm^3. The benefits of this project are irrigation, hydropower generation, fisheries and water supply.

Kadana reservoir project

Kadana dam is located in gorge cut by Mahi river through a low range of hills in Dahod of Gujarat just near the border with Rajasthan. The catchment area up to this project is 25,520 sqkm and catchment area intercepted at Banswara in Rajasthan is 6149 sqkm. The dam is composite earth fill and masonry gravity structure rising 58 m above the stream bed with the top length of dam about 1551 m with main spillway length 406 m in river gorge portion and 113 m long additional spillway in right bank. The effective storage capacity of Kadana reservoir is 1203 $Mm^{3.}$ The benefits of this project include irrigation facilities for 12795 ha and hydro - power generation by installation of 4 nos reversible turbines of capacity 60 MW each, with a total capacity of 240 MW. The total estimated cost of this project is Rs.101.86 crores, out of which Rs.49 crores are for hydro power generation.

Wanakbori weir

The weir is constructed across the river Mahi near Wanakbori village, Balasinnor tehsil of Kheda district in Gujarat. The weir is also known as Mahi stage-I project. The catchment area up to this project is 30,665 sqkm.The length at the top of dam is 796 m and maximum height above lowest point of foundation is 25 m. It has an ogee type spillway of 735 m length. The effective storage capacity of this composite dam is 36.24 Mm^3. The benefit of this project is irrigation for 3, 15,790 ha. The cost of the project is Rs.46.53 crores. The storage capacity of dam is increased to RL 69.240 m by providing 33 nos fuse gates, which will not result in any increase of HFL.

Panam project

The project is located in village Keldezar of tehsil Santrampur in Dahod district of Gujarat across river Panam, a tributary of river Mahi. The length at the top of masonry dam functioning as ogee spillway is 182 m and maximum height above the lowest point of foundation is 56.36 m. It has a catchment area of 2314 sqkm.The live storage capacity of the reservoir is 679.2 Mm^3. The purpose of this project is irrigation for 58,273 ha, water supply, power generation and fisheries. The total estimated cost of the project is Rs.5989.5 lakhs.

2.1.8 Streamflow data

Hydrological observation by CWC

In Mahi basin, CWC is conducting hydrological observations at 6 sites. Detailed salient features and the availability of data of these gauge and discharge observation sites are given in following tables.

Salient features of sites maintained by CWC in Mahi Basin

Sl.no	Name of site	Station code	Scheme	Type
1.	Mahi at Mataji	01 02 13 001	NNW	GDSWQ
2.	Jakham at Dhariwad	01 02 13 004	F F	GD
3.	Som at Rangeli	01 02 13 005	80 key	GDWQ
4.	Mahi at Paderdibadi	01 02 13 006	80 key	GDSWQ
5.	Anas at Chakaliya	01 02 13 007	163 key	GD
6.	Mahi at Khanpur	01 02 13 012	80 key	GDSWQ

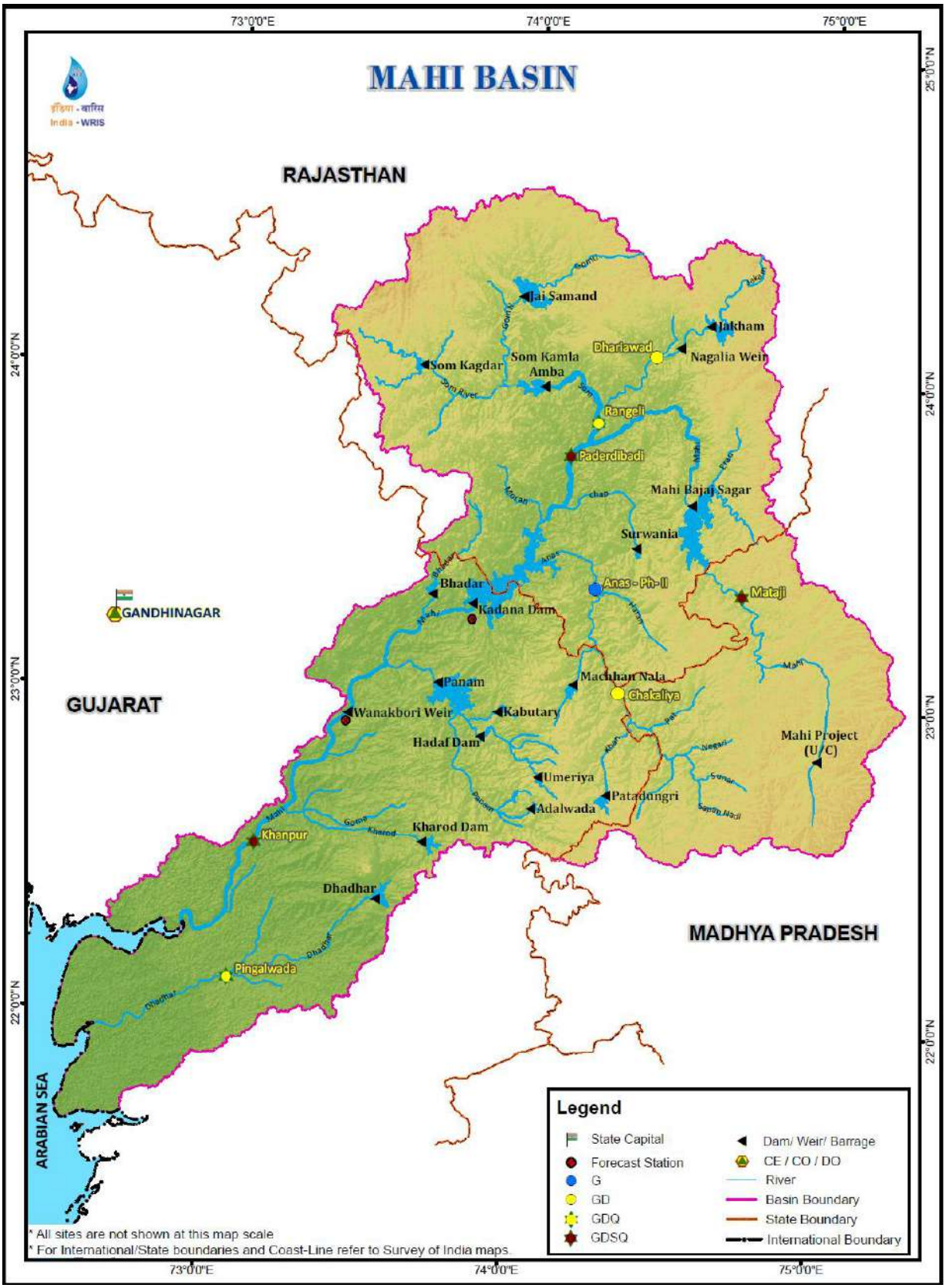
Location name	Local River	Lat. D M S	Long. D M S	Stn. Parameters				Type of gauge	Mode of Discharge Measurement
				Met	Hydro	WQ	Silt Lab		
Mataji	Mahi	23 20 57	74 43 31	SRG	GDS	WQ	Silt lab	Staff G	Wading, bridge, boat, float
Mahi dam	Mahi	23 37 43	74 32 50	SRG	G			Staff G	Dam site
Rangeli	Som	23 52 22	74 13 25	SRG	GD	WQ		Staff G	Wading, bridge, float

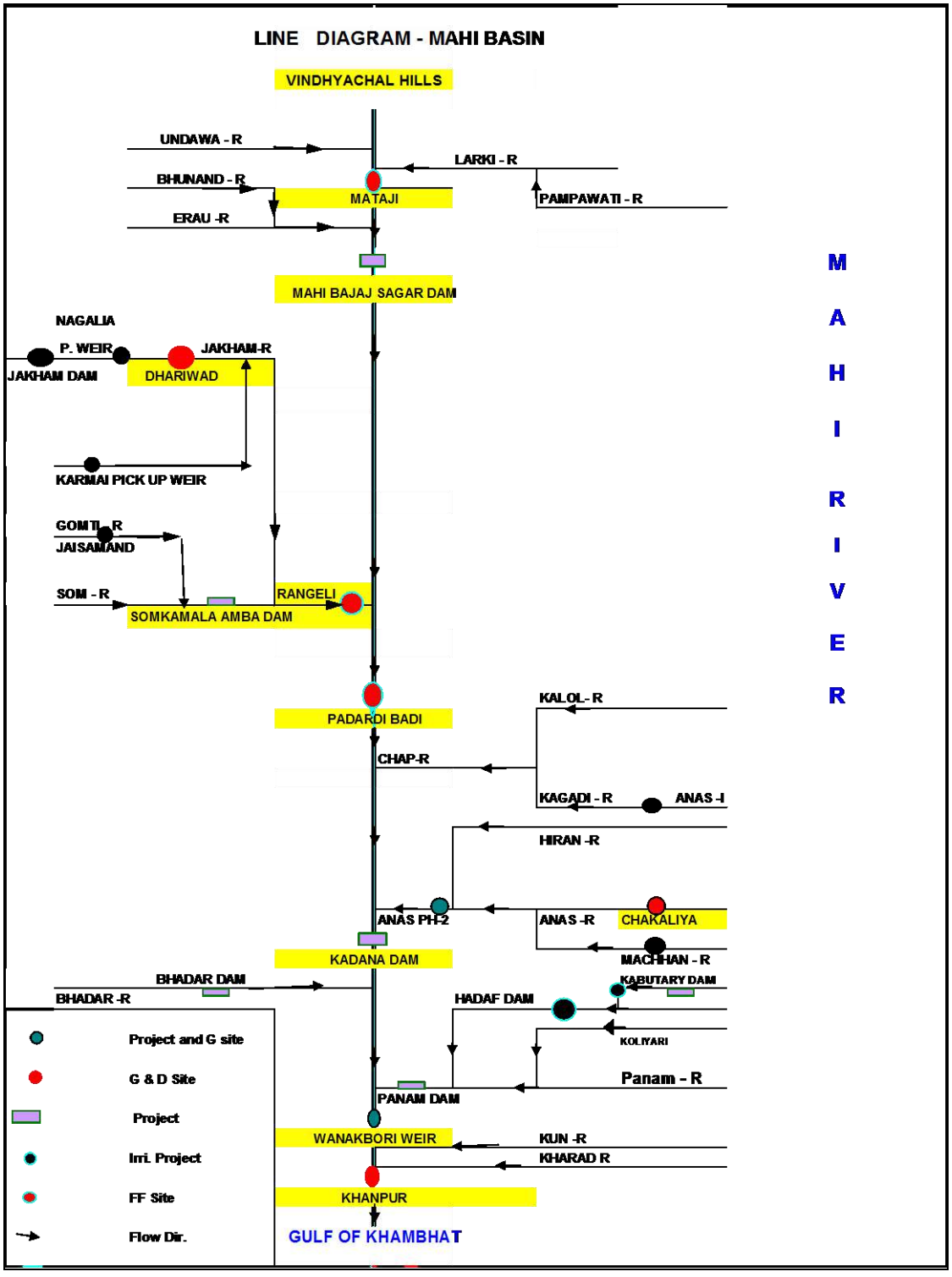
Som kamala amba dam	Som	23 58 36	74 02 00	SRG	G			Staff G	Dam site
Dhariwad	Jakham	24 04 43	74 28 02	SRG	GD			Staff G	Wading, bridge, float
Paderdibadi	Mahi	23 46 03	74 08 12	SRG	GDS	WQ	Silt lab	Staff G	Wading, boat, float
Chakaliya	Anas	23 02 58	74 19 14	SRG	GD			Staff G	Wading,bridge, float
Anas Ph-2	Anas	23 21 11	74 14 07	SRG	G			Steps	Converted to gauge site only.made seasonal site w.e.f.2002
Kadana dam	Mahi	23 18 16	73 49 31	SRG	G			Staff G	Dam site and FF station
Panam dam	Panam	23 03 14	73 43 00	SRG	G			Staff G	Dam site
Wanak bori weir	Mahi	22 56 51	73 25 46	SRG	G			Staff G	FF station
Khanpur	Mahi	22 31 55	73 08 27	FCS	GDS	WQ	Silt lab	Staff G	Wading, boat, ADCP

2.1.9 Data availability

S No.	Site name	Rain Fall	Discharge	Thrice daily water Level	Hourly water level (for Monsoon period only)	Sediment	Water quality
1	Mahi at Mataji GDSWQ	June‘89	July‘82	July ‘82	July ‘82	July‘82	July‘82
2	Jakham at Dhariwad GD	June‘89	June‘84	July ‘84	July‘84	NA	NA
3	Som at Rangeli GDQ	Jan’99	July‘88	July ‘78	July‘78	NA	July ‘88

4	Anas at Chakaliya GD	July‘91	Feb‘91	Feb ‘91	June‘91	NA	NA
5	Mahi at Paderdibadi GDSWQ	Aug‘85	June‘78	Sept‘77	Sept‘77	July ‘80	July‘78
6	Mahi at Khanpur GDSWQ	June‘88	June’88	Dec ‘78	June’79	June ‘87	Jan‘79
7	Som at Som-kamala-amba dam G	Jan’95	---	Jan’95	Jan’95	---	--
8	Anas at Anas ph-2 (seasonal) G	Jun’91	---	Jun’82	Jun’85	--	--
9	Mahi at Kadana dam G	--	--	Jun’78	Jun’78	---	---
10	Panam at Panam dam G	--	--	Jun’80	Jun’80	--	--
11	Mahi at wanak bori weir G	--	--	Jun’79	Jun’79	--	--
12	Mahi at Mahi Bajaj Sagar Dam G	--	--	Jun’82	Jun’82	--	--


MAHI BASIN
RAJASTHAN
GUJARAT
MADHYA PRADESH
GANDHINAGAR
ARABIAN SEA
Jai Samand
Jakham
Dhariawad
Nagalia Weir
Som Kagdar
Som Kamla Amba
Rangeli
Paderdibadi
Mahi Bajaj Sagar
Surwania
Bhadar
Kadana Dam
Anas - Ph-II
Mataji
Panam
Machhan Nala
Chakaliya
Wanakbori Weir
Kabutary
Hadaf Dam
Mahi Project (U/C)
Umeriya
Patadungri
Adalwada
Khanpur
Kharod Dam
Dhadhar
Pingalwada
Legend
State Capital
Forecast Station
G
GD
GDQ
GDSQ
Dam/ Weir/ Barrage
CE / CO / DO
River
Basin Boundary
State Boundary
International Boundary
* All sites are not shown at this map scale
* For International/State boundaries and Coast-Line refer to Survey of India maps
73°0'0"E
74°0'0"E
75°0'0"E
25°0'0"N
24°0'0"N
23°0'0"N
22°0'0"N


LINE DIAGRAM - MAHI BASIN
VINDHYACHAL HILLS
UNDAWA - R
LARKI - R
BHUNAND - R
MATAJI
PAMPAWATI - R
ERAU -R
MAHI BAJAJ SAGAR DAM
NAGALIA
P. WEIR
JAKHAM-R
JAKHAM DAM
DHARIWAD
KARMAI PICK UP WEIR
GOMTI - R
JAISAMAND
SOM - R
RANGELI
SOMKAMALA AMBA DAM
PADARDI BADI
KALOL - R
CHAP-R
KAGADI - R
ANAS -I
HIRAN -R
ANAS PH-2
ANAS -R
CHAKALIYA
MACHHAN - R
KADANA DAM
BHADAR DAM
BHADAR -R
KABUTARY DAM
HADAF DAM
KOLIYARI
Panam - R
PANAM DAM
WANAKBORI WEIR
KUN -R
KHARAD R
KHANPUR
GULF OF KHAMBHAT
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.
M A H I R I V E R

2.2 Sabarmati Basin

2.2.1 Geographical description of the basin

Sabarmati river is one of the major west flowing inter-state rivers in India, draining into the Gulf of Khambhat. The Basin is bounded by Aravalli hills in the North and Northeast, by ridge separating it from basins of minor streams and draining into Rann of Kutch and Gulf of Khambhat in West and by Gulf of Khambhat in the South. It is triangular in shape with the main river as the base and the source of the Watrak as the apex point. It originates in the Aravalli hills at latitude 24^0 40'N and longitude 73^0 20'E in Rajasthan state at an elevation of 762 m above m.s.l. The Sabarmati river has a length of 371 km and the drainage area is of 21674 sq km. Basin map of Sabarmati basin is enclosed as **Plate -2.2.1**. The State wise distribution is shown below.

Sl.no.	Name of State	River length (km)	Drainage area (sqkm)	Percentage of total
1	Rajasthan	48	4124	19
2	Gujarat	323	17550	81
	Total	371	21674	100

2.2.2 Description of River system

The Sabarmati river with its origin in Rajasthan, flows generally in South – West direction. It enters in Gujarat state and passes through the plains and continues to flow in the same direction and joins the Gulf of Khambhat in the Arabian sea. At its 51 km of run, the river is joined by the Wakal on the left bank near village Ghanpankari. Flowing generally in the South – West direction at 67^{th} km of its run, it receives the Sei on the right bank near Mahauri and then the Harnav on the left bank at about 103 km run. From respective sources beyond this confluence, Sabarmati flows through the Dharoil gorge. Emerging from the gorge it passes through the plains and is joined on its left bank at about 170 km from its source by the Hathmati, which is its major tributary. Continuing to flow in South – West direction, the river passes through Ahmedabad and about 65 km down stream, another major tributary, Watrak joins its on the left bank, flowing for a further distance of 68 km, the River outfalls in the Gulf of Khambhat in Arabian sea.

Description of tributaries

Sei

This is a right bank tributary of Sabarmati river. It rises in the Aravalli hills in Rajasthan and flows in South – West direction for a total distance of 95 km before it joins on its right bank. It drains an area of 946 sq km.

Wakal

This is a left bank tributary of Sabarmati river. It rises in the Aravalli hills in Rajasthan and flows in South – West direction for a total length of 88 km. It joins Sabarmati on its left bank. It drains an area of 1625 sq km.

Harnav

This is a left bank tributary of Sabarmati river. It rises in the northern portion of the Kulalia hills of Rajasthan ranges and flows in South – West direction for a total distance of 75 km. Harnav joins the left bank of Sabarmati. It drains an area of 972 sq km.

Hathmati

This is a left bank tributary of Sabarmati River this is a left bank tributary of Sabarmati river it rises in Southwest foot hills of Rajasthan range. In Gujarat state and flows in South -West direction for a distance of 122 km to meet the Sabarmati on its left bank.this tributary drains an area of 1526 sq km.

Watrak

This is a left bank tributary of Sabarmati river it rises in Panchara hills in Dungarpur district of Rajasthan and flows in Southwest direction for a distance of 248 km and joins Sabarmati on the left bank.Watrak and its tributaries drain an area of 8638 sq km.

A line diagram of river system, giving information of Sabarmati basin, its tributaries and sub-tributaries etc. indicating the location of major structures is enclosed as **Plate -2.2.2.**

2.2.3 Climatic characterstics

The Sabarmati basin experiences 3 marked seasons – summer (March-May), Monsoon (June-Sep.) & winter (Oct.-Feb.). From the available data & record, the basin contains two climatic regions, the northern part of the basin comprises sub tropical wet climate (generally basin area occupied by Gujarat). The major part of basin comprises tropical wet climate causes mainly

due to existence of Aravalli & the Western Ghats. The climate varies from arid in the Saurashtra area to semi –arid in North Gujarat to humid in coastal areas.

Temperature (°C) during year 2016-17

Year	Jotasan		Kheroj		Derol bridge		Ratanpur		Kheda		Voutha	
2016-17	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)
	46	2	45	5	Not working		46	7	41	17	40	16

2.2.4 Rainfall

Rainfall varies from a meager few mm in Saurastra to over 1000 mm in southern part. The average annual rainfall in the Sabarmati Basin is about 787.5 mm the south - west Monsoon sets in by middle of June and withdraws by the first week of October. The rainfall is mainly influenced by the southwest Monsoon.

Mean annual rainfall in 'mm' Sabarmati Basin CWC sites

Name of site	Data available (No of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Jotasan	21	743	33	982	53
Kheroj	28	724	31	745.4	56
Derol Bridge	28	745	27	563	38
Watrak dam	30	868	23	1431	49
Raskaweir	31	634	16	373	24
Ratanpur	25	804	19	744.4	34
Kheda	32	736	20	438.6	38
Sei dam	16	796	32	1073.4	49
Dharoi dam	16	803	33	793.8	50
Himatnagar	16	857	23	537.6	45
Voutha	9	744	19	551.2	38
Subhash bridge	8	818	27	514	45

2.2.5 Wind

Average wind speed is the lowest in Udaipur & higher in Ahmedabad district. In general, wind speeds are taken to be moderate over most of the months.

2.2.6 Geology

Hydro geologically the river basin is categorised by two distinct units viz.:

i. Consolidated formation

This hydro geological unit is mainly dominated by basaltic lava flows associated with inter trappean, infratrappean and archean rock formation represented by phyllites gneisses, quartzite & granites. Consolidated rocks mainly underlie north-eastern part of Gujarat

ii. Unconsolidated formation

Ground water occures under water table and in confined condition in the bed of sand, kankar & gravel that constitutes the alluvial aquifers occurred as discontinuous beds of varying thickness in hard rocks- terrain in the north & north eastern part of basin. The valley-fills that are having good ground water potential are quite prominent and significant in the hard rock areas in Udaipur.

In the northern part of the Basin, including areas in Rajasthan and those in sabarkantha district the aquifers available are the highly jointed and fractured or extensively weathered rock zones. Wells tapping some thick rock-formations of this type yield as much as 1, 00,000 litres per hour though – 40,000 litres per hour would be more common. Such aquifer of moderate potential is available within 100-150 m below GL and even as closed as at 30-40 m depth if one was especially fortunate.

The parts of the Basin in Kheda and Surendranagar district have only limited ground water potentials comparable to that in northern parts of the Basin and good confined aquifers are not available. The phreatic aquifers in the alluvial strata are only suited for shallow wells and low yields tube wells.

2.2.7 Description of the water storage / diversion structures

At present there are 13 completed major / medium irrigation schemes which are listed in the following table.

Existing projects in Sabarmati Basin

Sl. No.	Name of project	River	Storage capacity (Mm^3)		Purpose
			Gross	Live	
1	Sei dam	Sei	31.34	24.16	Diversion
2	Dharoil dam	Sabarmati	907.88	731.99	Multipurpose
3	Harnav-I	Harnav	----	----	Water Supply
4	Harnav - II	Harnav	21.67	19.97	Irrigation
5	Guhai	Guhai	62.34	57.04	Irrigation
6	Hathmati	Hathmati	161.0	153.0	Irrigation
7	Meshwo	Meshwo	82.00	77.00	Irriigation & Flood control
8	Mazam	Mazam	43.86	36.58	Flood control
9	Watrak	Watrak	176.9	154.3	Irrigation
10	Waidy	Suron	13.60	12.30	Irrigation
11	Raska weir	Meshwo	----	----	Irrigation
12	Moti fatewadi	Sabarmati	----	----	Irrigation
13	Vasana barrage	Sabarmati	----	----	Irrigation

Salient features of important major irrigation schemes namely Dharoil project and Watrak project are as follows.

Dharoi project

The project is located on Sabarmati River at Dharoil village of kheralu thehsil in Mehsana district of Gujarat. This comprises of a composite dam, having earthen dam of 843 m length with central spillway of 219 m. The maximum height from deepest foundation level for masonry dam is 52.00 m and for earth dam is 31 m. The catchment area up to project is 5475 sqkm. The live storage capacity of the dam is 731.99 Mm^3. The total estimated cost of the project is Rs.96 crores. The direct benefits of the project are water supply for Ahmedabad city, and providing irrigation facilities to an area of 42800 ha. The project also supports existing irrigation under fatewadi canal system. The indirect benefit of the project is flood control. There is provision for 1.4 MW Hydro - power generations also.

Watrak project

This project is located in village Pahadia of Malpur teh. In district Sabarkantha of Gujarat. The project envisages construction of a composite dam across Watrak River having ogee type spillway of length 89 m. The length at top of dam is 313 m and maximum height above the lowest point of Foundation is 43.31 m. The catchment area of this project is 1114 sqkm. The live storage capacity of the reservoir is 154.3 $Mm^{3.}$ The purpose of this project is irrigation for 25914 ha. The estimated cost of the project is Rs.47.58 crores.

2.2.8 Streamflow data

Hydrological observation by CWC.

In Sabarmati Basin, the CWC is conducting gauge and discharge observations at 6 sites. The details of these sites alongwith salient features in Sabarmati Basin are given in the following tables.

Sl.no	Name of site	Station code	Scheme	Type
1.	Wakal at Jotasan	01 02 12 001	F F	GD
2.	Sabarmati at Kheroj	01 02 12 003	F F	GD
3.	Sabarmati at Derol Bridge	01 02 12 006	F F	GDSWQ

4.	Watrak at Ratanpur	01 02 12 010	F F	GD
5.	Watrak at Kheda	01 02 12 012	F F	GD
6.	Sabarmati at Vautha	01 02 12 013	163 key	GDWQ

Salient features of sites maintained by CWC in Sabarmati Basin

Sr No	Name	Local River / tributory	Lat. N	Long. E	Stn Parameters			Silt Lab	Type of gauge	Mode of Discharge Observation
			D M S	D M S	Met	Hydro	WQ			
1	Jotasan	Wakal	24 21 20	73 10 05	SRG	GD			Staff G	Wading,boat, float
2	Sei dam	Sei	24 45 39	73 19 05	SRG	G			Staff G	Dam Sei
3	Kheroj	Sabarmati	24 13 45	73 00 26	SRG	GD			Staff G	Wading, boat, float
4	Harnav weir	Harnav	24 01 49	73 10 23	SRG	G			Staff G	Weir site
5	Dharoil dam	Sabarmati	24 00 13	72 51 24	SRG	G			Staff G	FF station, dam site
6	Hathmati weir	Hathmati	23 36 20	72 58 00	SRG	G			Staff G	Weir site
7	Derol Bridge	Sabarmati	23 34 24	72 48 25	SRG ARG	GDS	WQ	Silt lab	Staff G	Wading, bridge
8	Subhash bridge	Sabarmati	23 03 35	72 35 14	SRG	G			Staff G	FF station

9	Raska weir	Meshwa	22 54 19	72 44 30	SRG	G			Staff G	Weir site
10	Watrak dam	Watrak	23 18 53	73 25 00	SRG	G			Staff G	Dam site
11	Ratanpur	Watrak	22 58 31	72 53 02	SRG	GD			Staff G	Wading, bridge float
12	Kheda	Watrak	22 44 45	72 40 49	SRG	GD			Staff G	Wading, bridge float
13	Vautha	Sabarmati	22 38 59	72 32 08	Na	GD	WQ		Staff G	Wading, boat, float

2.2.9 Data availability

Sl. No	Site name	Rain fall	Disch.	Thrice daily water level	Hourly water level (Monsoon period only)	Sediment	Water quality
1	Sabarmati at Jotasan GD	June‘94	June‘95	June‘95	June ‘95	N A	N A
2	Sabarmati at Kheroj GD	June‘88	June‘81	June‘81	June ‘81	N A	N A
3	Sabarmati at derol GDSQ	June‘88	June‘91	Aug‘80	Aug.80	Sept 92	July 92
4	Watrak at Ratanpur GD	Aug‘85	July ‘89	Mar‘85	June ‘85	N A	N A
5	Watrak at Kheda GD	Jun ‘88	July ‘89	Aprl‘85	June ‘85	N A	N A
6	Sabarmati at Vautha GDQ	N A	June2000	June2000	June2000	N A	June2000
7	Sei dam G	Jun’90	--	Mar’79	Mar’79	---	---
8	Harnav weir G	Jun’79	---	Jul’79	Jul’79	--	--
9	Dharoil dam G	Jun’89	--	Dec’78	Dec’78	--	--
10	Hathmati weir G	Feb’85	--	Jun’80	Jun’80	--	--
11	Subhash bridge G	--	--	Jul’79	Jul’79	--	--
12	Raska weir G	Nov’84	--	Nov’84	Nov’84	--	--
13	Watrak dam G	Jul’85	--	Jul’85	Jul’85	--	--

Plate 2.2.1

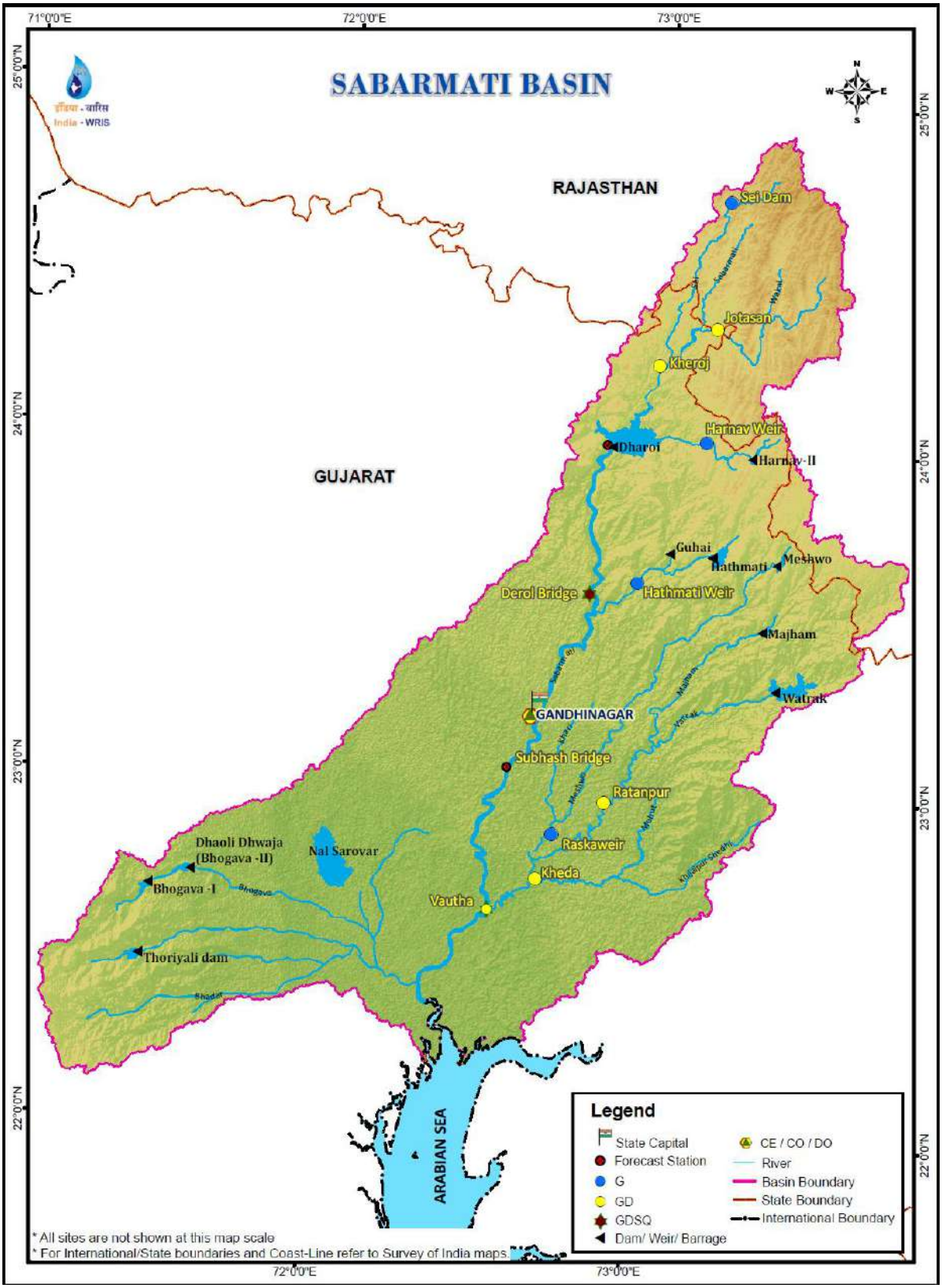
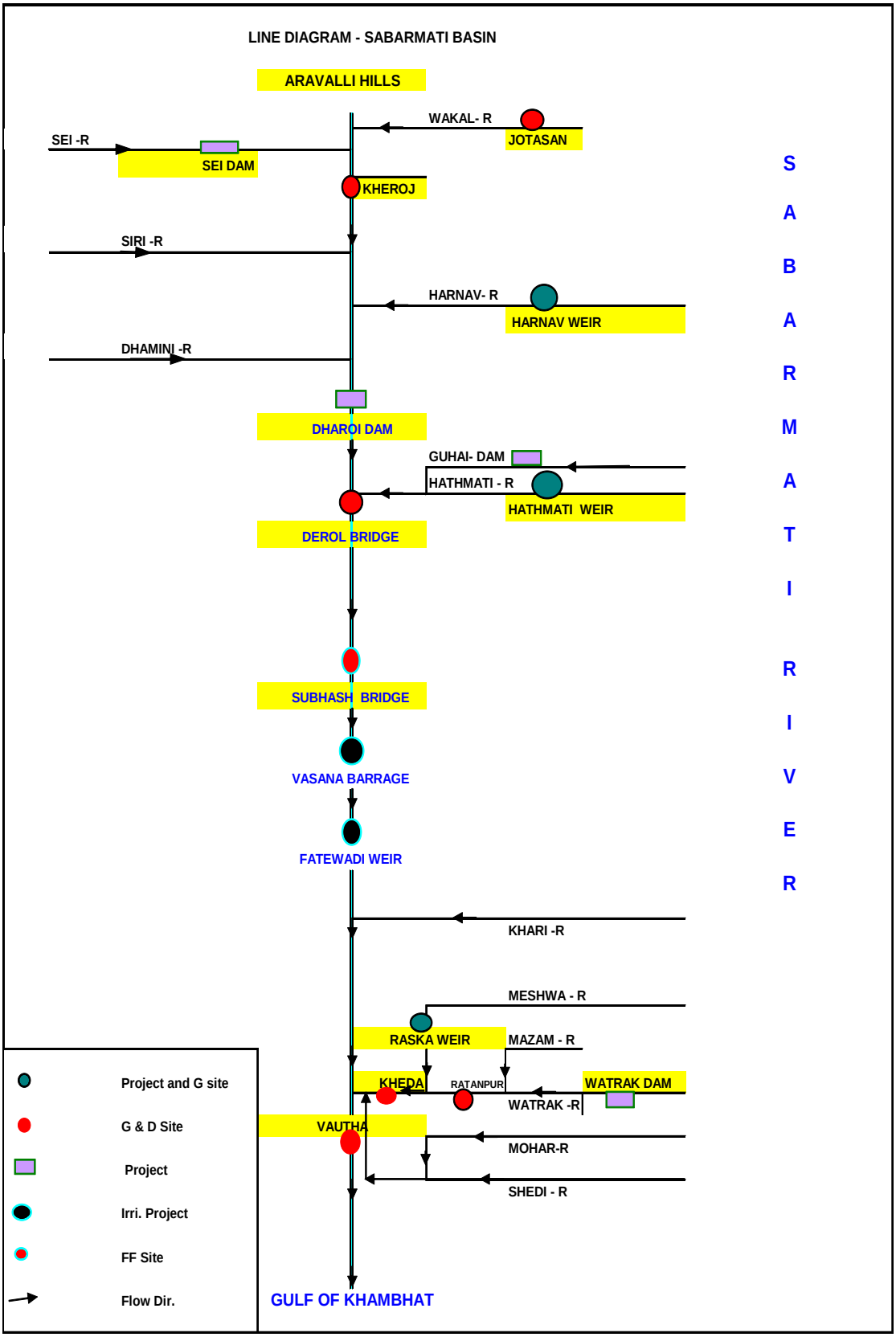

SABARMATI BASIN
RAJASTHAN
GUJARAT
Sei Dam
Jotasan
Kheroj
Harnav Weir
Dharoi
Harnav-II
Guhai
Hathmati
Meshwo
Derol Bridge
Hathmati Weir
Majham
Watrak
GANDHINAGAR
Subhash Bridge
Ratanpur
Raskaweir
Kheda
Vautha
Dhaoli Dhwaja
(Bhogava -II)
Nal Sarovar
Bhogava -I
Thoriyali dam
ARABIAN SEA
Legend
State Capital
Forecast Station
G
GD
GDSQ
Dam/ Weir/ Barrage
CE / CO / DO
River
Basin Boundary
State Boundary
International Boundary
* All sites are not shown at this map scale
* For International/State boundaries and Coast-Line refer to Survey of India maps
71°0'0"E
72°0'0"E
73°0'0"E
25°0'0"N
24°0'0"N
23°0'0"N
22°0'0"N

Plate- 2.2.2


LINE DIAGRAM - SABARMATI BASIN
ARAVALLI HILLS
WAKAL- R
JOTASAN
SEI -R
SEI DAM
KHEROJ
SIRI -R
HARNAV- R
HARNAV WEIR
DHAMINI -R
DHAROI DAM
GUHAI- DAM
HATHMATI - R
HATHMATI WEIR
DEROL BRIDGE
SUBHASH BRIDGE
VASANA BARRAGE
FATEWADI WEIR
KHARI -R
MESHWA - R
RASKA WEIR
MAZAM - R
KHEDA
RATANPUR
WATRAK DAM
WATRAK -R
VAUTHA
MOHAR-R
SHEDI - R
GULF OF KHAMBHAT
SABARMATI RIVER
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.

2.3 Luni Basin

2.3.1 Geographical description of the Basin

Luni is the only river basin of any significance in western Rajasthan, which forms the bulk of arid zone. Luni originates from western slopes of the Aravalli ranges at an elevation of 772 m above m.s.l. near Ajmer flowing in south west direction and traversing a course of 511 km in Rajasthan, it finally flows into the Rann of Kachchh. Most of its tributories drain the steep North-West of Aravalli hills and join it on left side. Its total catchment area falls in Rajasthan. Luni Basin is situated in between 24^0 11' to 26^0 43' north latitude and 70^0 37' to 74^0 39' east longitude approximately. The peculiarity of this river is that it tends to increase its width rather than deepening the bed because the banks are of soils, which are easily erodable whereas beds are of sand. The floods develop and disappear so rapidly that they have no time to scour the bed. The Aravalli ranges form its east boundary whereas main course of river in Barmer district itself forms north boundary and mostly Banas and initial reach of Chambal river form its southern boundary. Basin map of Luni Basin is enclosed as **Plate -2.3.1**

2.3.2 Description of River system

Luni receives all the main tributaries on its left bank except one i.e. Jojari (Mithri) on the right bank. Luni receives ten tributories namely Lilari, Guhiya, Bandi (Hemawas), Sukri (Hemawas), Sukri, Mithri, Jawai, Khari Bandi, Sukri Bandi and Sugi. Drainage on the left bank of Luni is, therefore, more extensive than on right bank. The Luni drains an area of 32879 sqkm in Rajasthan State only.

The catchment area of the basin up to Chittalwana is 32661 sqkm. The remaining catchment area of the Luni basin below Chittalwana and up to Rann of Kachchh is only 218 sqkm which is delta where the water spreads out and does not contribute any runoff. The total available runoff from entire Luni basin is 788 Mm^3, out of which Guhiya, Jojari (Mithri), Bandi (Hemawas) and Jawai tributaries contribute runoff of 116 Mm^3, 64 Mm^3, 120 Mm^3 and 125 Mm^3 respectively. The catchment area, length and elevation of source of important tributaries are shown below.

S.no	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area (sqkm)
1	Luni	Main	737	511	32879
2	Jojari (Mithri)	Right	312	83	1060
3	Lolari	Left	731	60	1611
4	Guhiya & Sukri (Hemavas)	Left	237	125	4126
5	Bandi (Hemavas)	Left	935	135	3016
6	Sukari	Left	995	140	3280
7	Mithri	Left	459	71	2637
8	Jawai	Left	1099	145	2701
9	Khari bandi	Left	701	84	2671
10	Sukri bandi	Left	588	85	1161
11	Sugi	Left	688	80	1370

A line diagram of River system giving information of Luni Basin & its tributaries and sub-tributaries etc is enclosed as **Plate -2.3.2.**

2.3.3 Climatic characterstics

Temperature (°C) **during year 2016-17**

Year	Balotra		Gandhav	
	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)
2016-17	46.5	7.2	50	6

2.3.4 Rainfall

The 50 cm isohyet approximately follow Aravallies range and is dividing line between arid and semi arid in the west and sub humid in the east and south east. The rainfall is erratic and its distribution is uneven in the catchment.

Mean annual rainfall in mm Luni Basin CWC sites

Name of site	Data available (No of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Balotra	17	293	18	304.4	28
Gandhav	15	397	15	80	14

2.3.5 Geology

Aravallies form the watershed boundary that divides the state virtually into two broad physio-climatic zones i.e. arid and semi arid. The arid zone that lies to the west of Aravallies (whole Luni basin) is covered by vast stretches of sand intercepted by numerous hillocks of low elevation. The North-West part of Aravallies shows discontinuity and is full of wide gaps enabling penetration of western sand dunes to East. The drainage system mostly continues to the eastern half of the state; most of the easterly flowing streams drain into Chambal river. On West of Aravallies, only Luni has outlet to the Rann of Kachchh.

2.3.6 Description of the water storage / diversion structures

No major irrigation structure exists in the Luni Basin. However, there is a net deficit of the available runoff due to all existing/under construction /proposed schemes in Luni Basin. Below table shows the salient features of Some of the important irrigation schemes.

Description	**Jawai dam**	**Jaswant sagar dam**	**Hemawas**	**Sardar samand**	**Banki bund**
Tehsil	Bali	Bilara	Pali	Sojat	Ahore
District	Sirohi	Jodhpur	Pali	Pali	Jalore
Latitude	24^0 06’40”	26^0 44’45”	25^0 44’00”	25^0 26’54”	24^0 42’00”
Longitude	73^0 09’00”	72^0 44’45”	73^0 20’00”	73^0 20’58”	72^0 53’00”
C.a.(sq km)	787	3367	1124	2072	1716
C.c.a. (ha)	41300	6381	8300	10337	5235
Gross storage Mm3	198	52.8	62.5	88	48.6

Live storage capacity Mm3	184	52.6	62.5	88	34.5
Type of dam	Masonry	Earthen	Earthen	Earthen	Earthen

2.3.7 Streamflow data

Hydrological observations by CWC

In Luni Basin, the central waster commission is conducting hydrological observations i.e. Gauge and discharge observations at 2 sites. The details of the sites are given below

Sl.No.	Name of site	Station code	Scheme	Type
1.	Luni at Gandhav	01 02 01 002	NNW	GD
2.	Luni at Balotra	01 02 01 001	163 key	GD

The data of above two sites have been presented in this book. During the water year 1984-85 and 1985-86, the site Luni at Gandhav was under the administrative control of defunct Jodhpur gauging division.

Salient features of sites maintained by CWC in Luni Basin

Sr No	Name	Local River	Lat.	Long.	Stn Parameters		Type of gauge	Discharge Measurement
			D M S	D M S	Met	Gauge		
1	Gandhav	Luni	24 59 22	71 40 47	SRG	GD	Staff G	Wading, bridge, float
2	Balotra	Luni	25 49 18	72 13 23	SRG	GD	Staff G	Wading, float

2.3.8 Data availability

Sl No	Site name	Rain fall	Discharge	Thrice daily water level	Hourly water level (for Monsoon period only)
1	Luni at Gandhav GD	Jan'99	June '74	June '74	June '74
2	Luni at Balotra GD	July'90	July '90	July '90	July '90

Plate-2.3.1

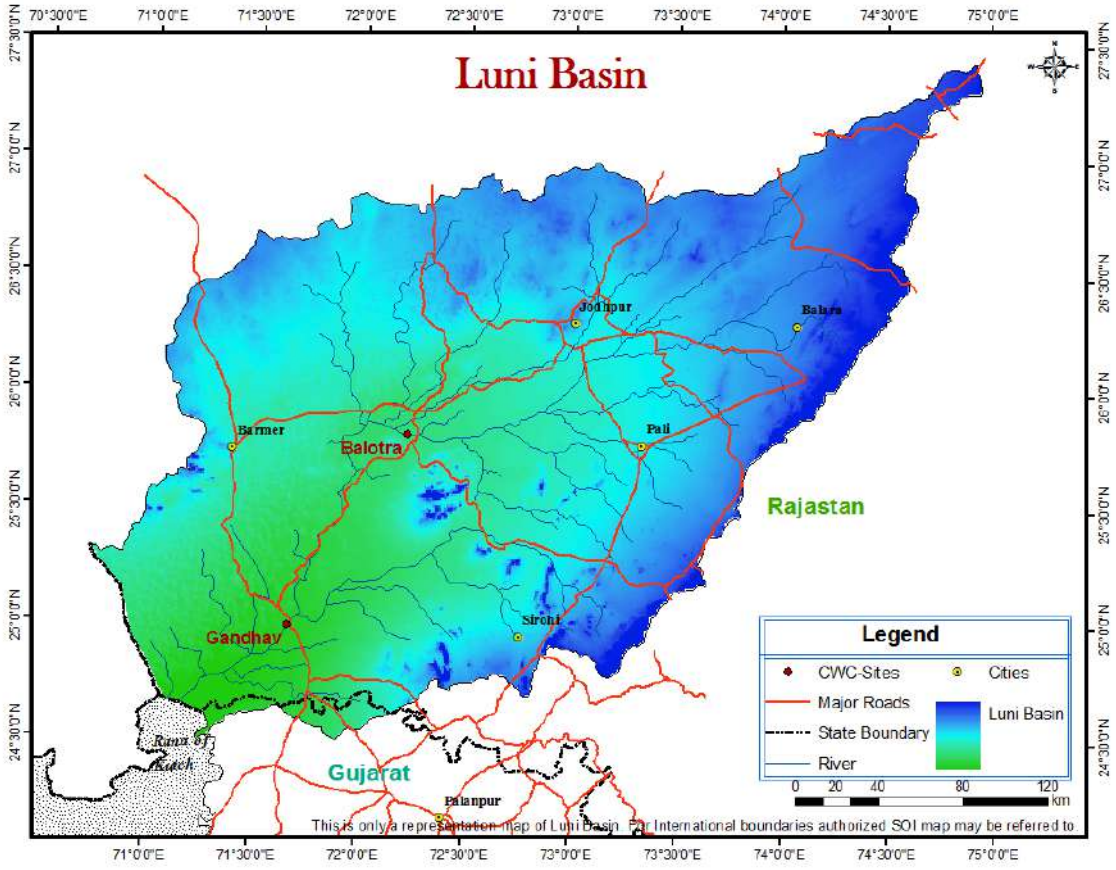
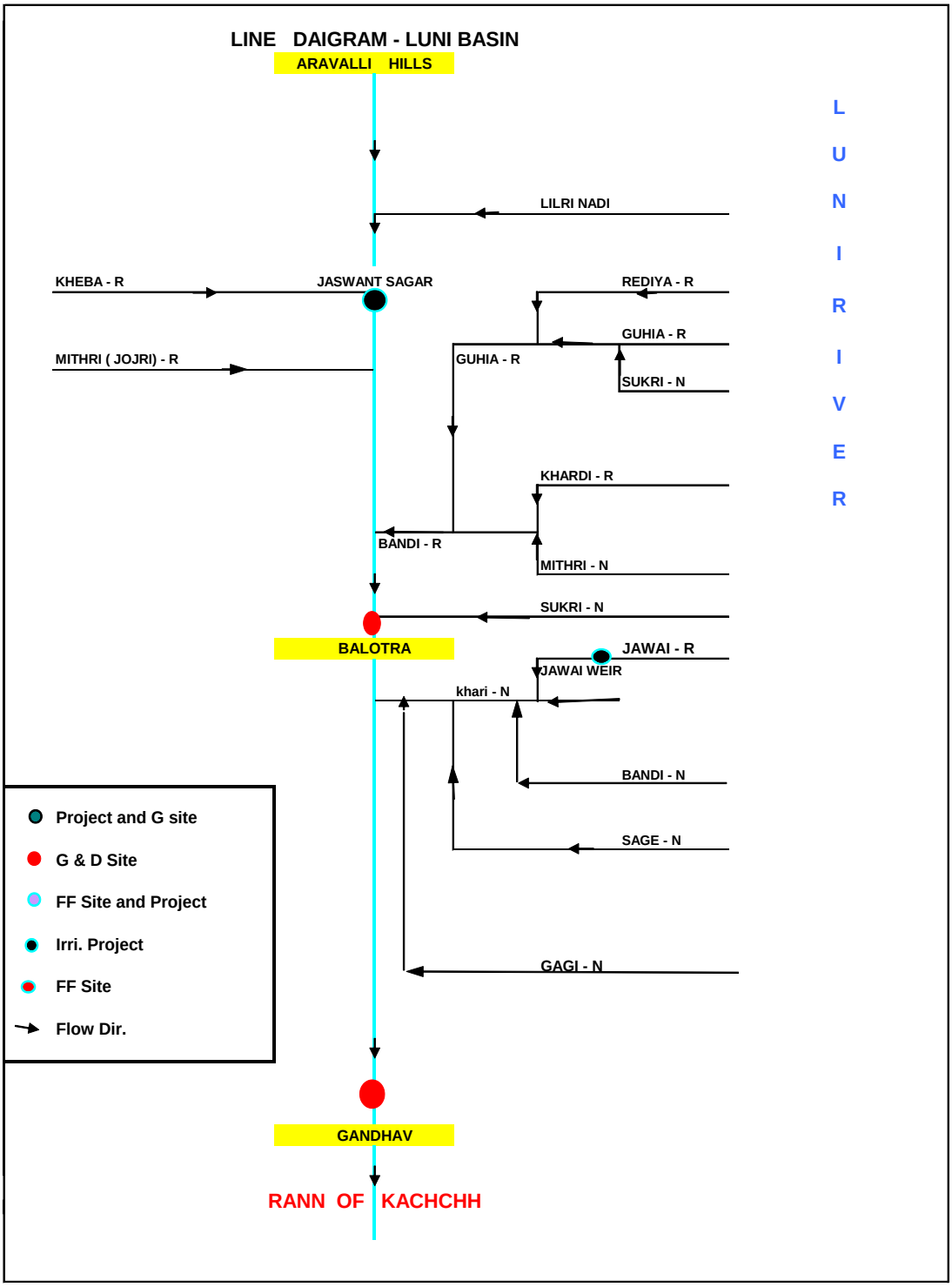

Luni Basin
Jodhpur
Barmer
Balotra
Pali
Rajastan
Sirohi
Ganghav
Gujarat
Palanpur
Legend
CWC-Sites
Cities
Major Roads
State Boundary
River
Luni Basin
0 20 40 80 120
km
This is only a representation map of Luni Basin. For International boundaries authorized SOI map may be referred to.

Plate-2.3.2


LINE DAIGRAM - LUNI BASIN
ARAVALLI HILLS
LILRI NADI
KHEBA - R
JASWANT SAGAR
REDIYA - R
GUHIA - R
MITHRI (JOJRI) - R
GUHIA - R
SUKRI - N
KHARDI - R
BANDI - R
MITHRI - N
SUKRI - N
BALOTRA
JAWAI - R
JAWAI WEIR
khari - N
BANDI - N
SAGE - N
GAGI - N
GANDHAV
RANN OF KACHCHH
L U N I R I V E R
Project and G site
G & D Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

2.4 Banas Basin

2.4.1 Geographical description of the Basin

Banas river originates from Aravalli hills and descends in a South-Western direction through Rajasthan state and travels through Banaskantha and Mehsana district of Gujarat before it drains into little Rann of Kutchh. The Banas basin is the northern basin and is situated between 23^0 30' 24^0 55' north latitudes and 71^0 15' to 73^0 15' east longitudes approximately. Saraswati and Luni basins form the southern and northern boundaries of this basin. The Aravalli hills form its eastern extremity.the Banas drains an area of 8674 sqkm, out of which nearly 37.69% lies in Rajasthan state and remaining 62.31% falls in Gujarat state. Basin map of Banas basin is enclosed as **Plate -2.4.1**

The state and district wise distribution of its drainage area is shown the following table

Sl.no.	**Name of state**	**Name of district**	**Length of River km**	**Drainage area sqkm**	**% of total ca**
1	Rajasthan	Sirohi	78	3269	37.69
2	Gujarat	Banaskantha	119	4638	53.47
3	Gujarat	Mehasana	69	767	8.84
Total			**266**	**8674**	**100.00**

2.4.2 Description of River system

The Banas rises near Pindwara of Sirohi district of Rajasthan at an elevation of 372.51m above m.s.l. Little Rann of Kachchh is the outfall of Banas River. Sipu is the only right bank tributary of Banas, which drains into the main channel. There are 6 tributaries on the left bank of Banas river namely the Batria, the Sukli, the Sewaran, the Suket, the Balaram and the Khari which drain into the main channel. Hence the draining system on the left bank of the Banas river is more extensive as compared to the right bank area. The Sipu and the Khari are the two important right and left bank tributories, which together drain nearly 37% of the total catchment area of Banas.

Sipu

Sipu is the principal trtibutary of the Banas rising from Sirohi and Mount Abu hills in Sirohi district of Rajasthan state. Abu hills fall between the Banas and Sipu sub -basin. About 30% of Mount Abu hills direct runoff drains into the Sipu river while about 70% of Mount Abu hills direct runoff flows into the Banas river. The confluence of Sipu and Banas river is 12 km downstream of Dantiwada dam.

Khari

Khari river rises from Palanpur (Banaskanthadistrict) and drains into the Banas river through Mehsana district at 80 km downstream of Dantiwada dam.

Sukli

The Sukli tributary rises from Aravalli hills near Pindwara of Sirohi district (Rajasthan) and drains into the Banas river downstream of Swaroopganj dam and 9 km upstream of Aburoad in Rajasthan.

Batria

The Batria rises near Ambaji hills of Aravalli range and drains into the Banas, 3km upstream of Abu road. It passes through Sirohi district of Rajasthan.

Sewaran, Suket and Balaram

The Sewaran, Suket and Balaram tributaries rises near Ambaji hills of Aravalli ranges. Sewaran and Suket before they both drain into Banas river 7.5 km downstream of Abu Road pass from Banaskantha and Sirohi districts. Balaram river totally drains Banaskantha district. Its confluence with Banas is 14 km upstream of Dantiwada dam. A line diagram of River system giving information of Banas, its tributaries and sub-tributaries etc. indicating the stations showing diversions etc enclosed as **Plate -2.4.2.**

The catchment area, length and elevation of source of the above said tributaries are indicated in the following table.

Sl.no.	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area (sq km)
1	Banas	Main	372.51	266	8674
2	Sipu	Right	1150	75	1420
3	Sukli	Left	372.51	38	438
4	Batria	Left	780	24	218

5	Sewaram	Left	850	28	202
6	Suket	Left	606	15	79
7	Balaram	Left	807	40	345
8	Khari	Left	215.285	88	1391

2.4.3 Climatic characterstics

Temperature (°C) during year 2016-17

Year	Kamalpur		Chitrasani		Sarotry		Abu road	
	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)	Max. (°C)	Min. (°C)
2016-17	45	8	43	9	44	5	44	5

2.4.4 Rainfall

Mean annual rainfall- Banas Basin- CWC sites

Name of site	Data available (No of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Abu Road	37	668	31	883.8	49
Sarotry	28	777	22	697.6	46
Chitrasani	37	705	36	688.6	44
Bhakudar	32	655	19	519	26
Kamalpur	36	532	12	590.6	23
Dantiwada	18	637	20	389.4	22
Ambaji	18	763	27	816.4	42
Mt.abu	18	1381	38	1377.8	60

2.4.5 Description of the water storage / diversion structures

A line diagram of River system giving information of Banas, its tributaries and sub tributaries etc indicating the stations showing diveRsions, etc is enclosed as Fig 3.4.

List of existing projects in Banas Basin

Sl.no.	Name of project	River	Storage capacity (Mm^3)		Purpose
			Gross	Live	
1	Swarupgunj dam	Banas	39.05	-----	Irrigation
2	Dantiwada dam	Banas	464	444	Irrigation
3	Sipu dam	Sipu	177.8	156	Irrigation

2.4.6 Streamflow data

Hydrological observation by CWC

In Banas Basin the central water commission is conducting hydrological observation i.e. Gauge and discharge observation at 4 sites. The details of these four sites are given below.

Sl.no.	**Name of site**	**Station code**	**Scheme**	**Type**
1.	Banas at abu road	01 02 02 002	F F	GDWQ
2.	Banas at Sarotry	01 02 02 003	F F	GD
3.	Balaram at Chitrasani	01 02 02 004	F F	GDWQ
4.	Banas at Kamalpur	01 02 02 007	NNW	GDSWQ

Salient features of sites maintained by CWC

Sr No	Location Name	Local River	Lat. D M S	Long. D M S	Stn. Parameters			Silt lab	Type of gauge	Mode of Discharge Measurement
					Met	Gauge	WQ			
1	Swarup-ganj	Banas	24 41 28	72 55 52	SRG	G			Staff G	Weir site
2	Abu road	Banas	24 29 38	72 47 30	SRG	GD	WQ		Staff G	Wading,boat
3	Sarotry	Banas	24 22 04	72 32 48	Arg/SR	GD			Staff	Wading,bridge

					G				G	
4	Chitrasani	Balaram	24 17 20	72 29 54	SRG/arg	GD	WQ		Staff G	Wading,bridge
5	Dantiwada dam	Banas	24 20 14	72 20 17	SRG	G			Staff G	FF station, dam site
6	Bhakudar	Sipu	24 23 56	72 18 02	SRG	G			Staff G	Dam site
7	Kamalpur	Banas	23 47 59	71 45 00	SRG	GDS	WQ	Silt lab	Staff G	Wading,float

2.4.7 Data availability

Sl No	Site name	Rain fall	Disch.	Thrice daily water level	Hourly water level (for Monsoon period only)	Sediment	Water quality
1	Banas at Aburoad GDWQ	Jun-80	July-89	May-78	Jun- 88	NA	Jul- 88
2	Banas at Sarotry GD	Jun-80	Jun-89	Jun-80	Jun-80	NA	NA
3	Balaram at Chitrasani GDWQ	Jun-80	July-90	May-78	Jun-78	NA	Jul-88
4	Banas at Kamalpur GDSWQ	Jun-81	Jul-71	July-71	Aug-71	Aug-83	Jun-73
5	Swarupganj G	--	--	Jul-89	Jul-89	--	--
6	Dantiwada dam G	Jun-85	---	Jul-78	Jul-78	--	--
7	Bhakudar dam G	Jul-85	--	Jun-79	Jun-79	---	--

Plate 2.4.1

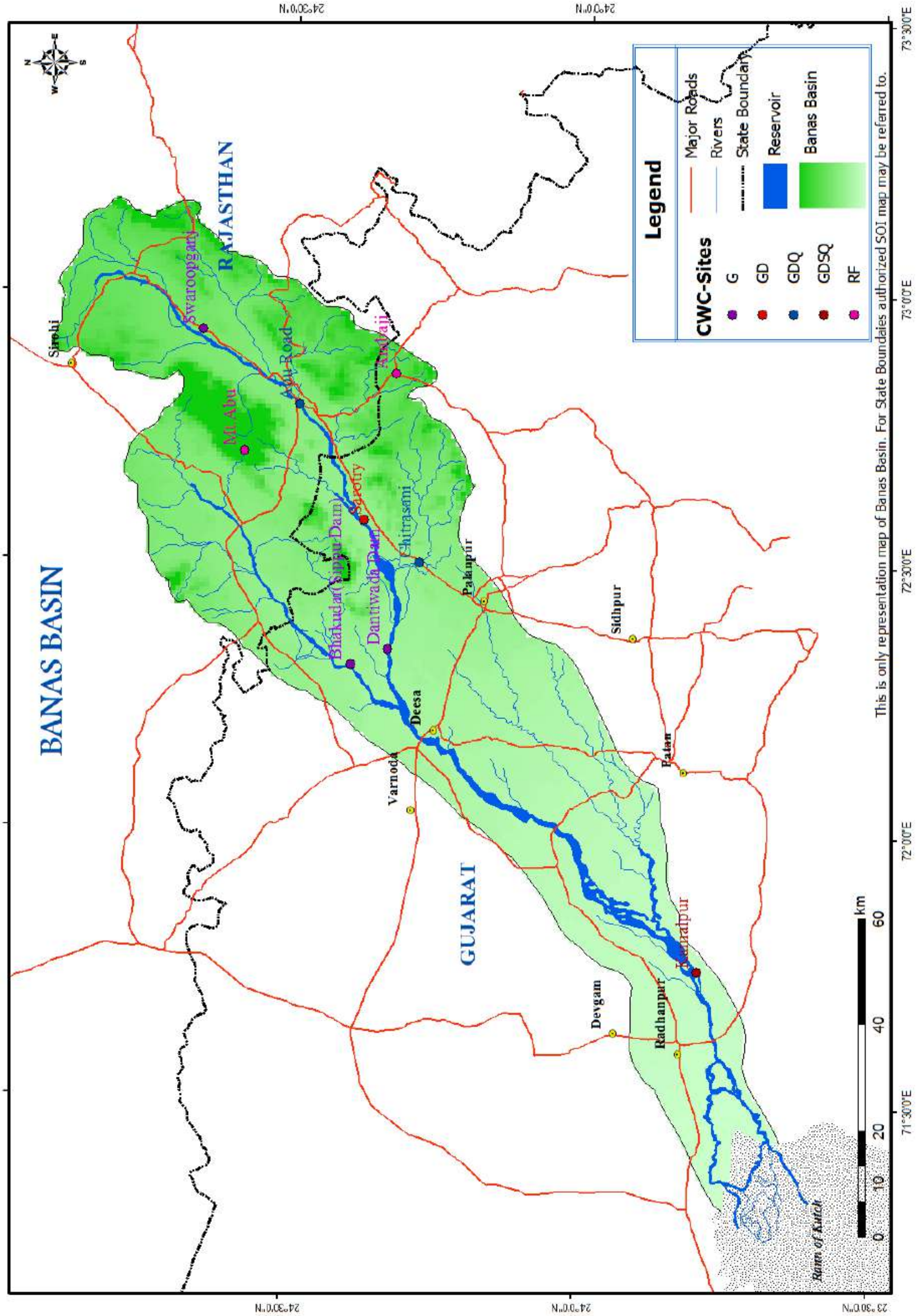
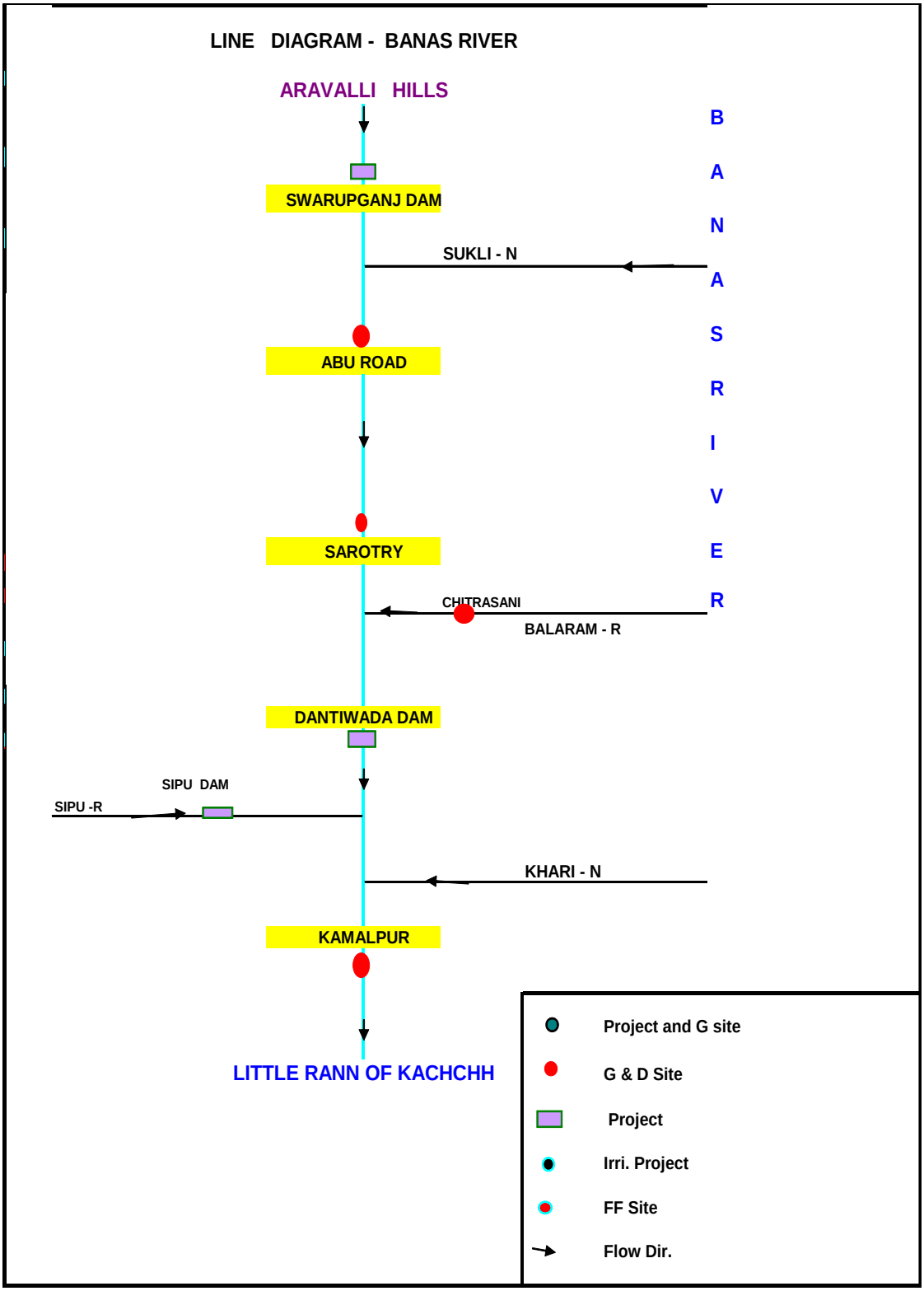

BANAS BASIN
RAJASTHAN
GUJARAT
Legend
CWC-Sites
G
GD
GDQ
GDSQ
RF
Major Roads
Rivers
State Boundary
Reservoir
Banas Basin
Sirohi
Swaroopganj
Abu Road
Mt.Abu
Ambaji
Chitrasani
Palanpur
Sidhpur
Deesa
Varnoda
Patan
Devgam
Radhanpur
Rann of Kutch
km
0
10
20
40
60
This is only representation map of Banas Basin. For State Boundaries authorized SOI map may be referred to.

Plate-2.4.2


LINE DIAGRAM - BANAS RIVER
ARAVALLI HILLS
B
A
N
A
S
R
I
V
E
R
SWARUPGANJ DAM
SUKLI - N
ABU ROAD
SAROTRY
CHITRASANI
BALARAM - R
DANTIWADA DAM
SIPU DAM
SIPU -R
KHARI - N
KAMALPUR
LITTLE RANN OF KACHCHH
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.

2.5 Shetrunji Basin

2.5.1 Geographical description of the Basin

The Shetrunji is one of the major Rivers of Saurastra. The Shetrunji basin is the eastern most basin of Saurastra and is situated in between 21^0 00' to 21^0 47' north latitude and 70^0 50' to 72^0 10' east longitude. The river Shetrunji originates at Chachai Hills in Gir forest of Junagarh district at 380 m above m.s.l. and flows towards East direction till its fall in the Gulf of Khambhat near Santhrampur port. The river Shetrunji makes fertile, the area of Amerli and Bhavnagar districts and some part of Junagarh district of Saurashtra. The Shetrunji drains an area of 5514 sqkm out of which more than 50% in Amerli district. Basin map of Shetrunji Basin is enclosed is enclosed as **Plate -2.5.1**

The district wise distribution of drainage area is shown below.

Name of district	Drainage area sq km	% of total area
1. Amreli	2946.68	53.44
2. Bhavnagar	2492.88	45.21
3. Junagarh	74.44	1.350
Total	**5514.00**	**100.00**

2.5.2 Description of River system

The total length of this east flowing river from its origin to the outfall into the Gulf of Khambhat is 182 km. This river receives tidal influence for a length of 5 km from the mouth. The Shetrunji receives several tributaries on both banks. There are 9 tributaries having lengths more than 15 km. Out of which Safara, Shel, Khari and Talaji are the 4 tributaries on the right bank of Shetrunji and the remaining 5 tributaries viz Stali, Thebu, Gagadia, Rajwal and Kharo are on left bank. The drainage system on left bank of Shetrunji is more extensive as compared to the right bank area.

The Stali, Thebi and Gagadia are important tributaries feeding from left bank of Shetrunji and drain nearly 34% of total catchment area of the river Shetrunji. The Gagadia and Theli (Thebu) are the principal tributaries of Shetrunji rising from the high ground near visavadar talukas of Junagarh district. The catchment area, length and elevation of source, of the important tributaries are tabulated in the following table

Sl.no	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area(sqkm)
1	Shetrunji	Main	380	182	5514
2	Satali	Left	400	35	651
3	Theli	Left	201	18	484
4	Safara	Right	250	34	226
5	Shel	Right	273	42	303
6	Gagaria	Left	180	52	754
7	Kharai	Right	211	39	665
8	Kharo	Left	125	34	261
9	Rajwal	Left	100	34	321
10	Talaji	Right	273	23	134

A line diagram of river system giving information of Shetrunji basin, its tributaries and sub-tributaries etc. indicating the stations showing diversions etc is enclosed as **Plate -2.5.2.**

2.5.3 Climatic characterstics

The average rainfall in the Shetrunji Basin is 604.52 mm. The south -west Monsoon sets in by middle of June and withdraws by the first week of October. About 90% of total rainfall is received during July and August. Owing to the topographical characteristics climate is variable.

Temperature (°C) during year 2016-17

Lowara		
Year	**Max.** (°C)	**Min.** (°C)
2016-17	42	11

Mean annual rainfall in mm Shetrunji Basin CWC sites

Name of site	Data available (No of yeaRs)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Lowara	28	478	25	789	46

2.5.4 Description of the water storage / diversion structures

Major / medium irrigation projects in River Basin Shetrunji

At present, there are 16 completed irrigation schemes (1 major and 15 minor).

A) Major Irrigation Scheme:

1) Shetrunji Irrigation Scheme:

B) Minor Irrigation Scheme:

1	Munjiasar	9	Thebi
2	Vedi	10	Khodiar
3	Popatdi	11	Shel Dedumal-1
4	Bavdi	12	Kodvadri
5	Hanol	13	Rajwal
6	Kharo	14	Hamirpura
7	Pingli	15	Samidhiara
8	Datred (P.W)		

Shetrunji irrigation scheme

The Shetrunji irrigation scheme comprises construction of masonry dam in the river portion and earthen dam on both the banks. The catchment area at dam site is 430 sqkm. It has gross capacity of 350 MCM with live storage of 309 Mm^3. It commands gross area of 2, 09,400 acres of land out of which cultivated command area is 1,21,400 acres and irrigable area is 88,000 acres.

2.5.5 Streamflow data

Hydrological observation by CWC

In Shetrunji basin, Central Water Commission is conducting hydrological observations at only one site namely Lowara for which data has been finalised and the same is presented in this book. The details of the site are given below.

Sl.no.	Name of site	Station code	Scheme	Type
1.	Shetrunji at Lowara	01 02 09 001	NNW	GDSWQ

Salient features of sites maintained by CWC in Shetrunji Basin

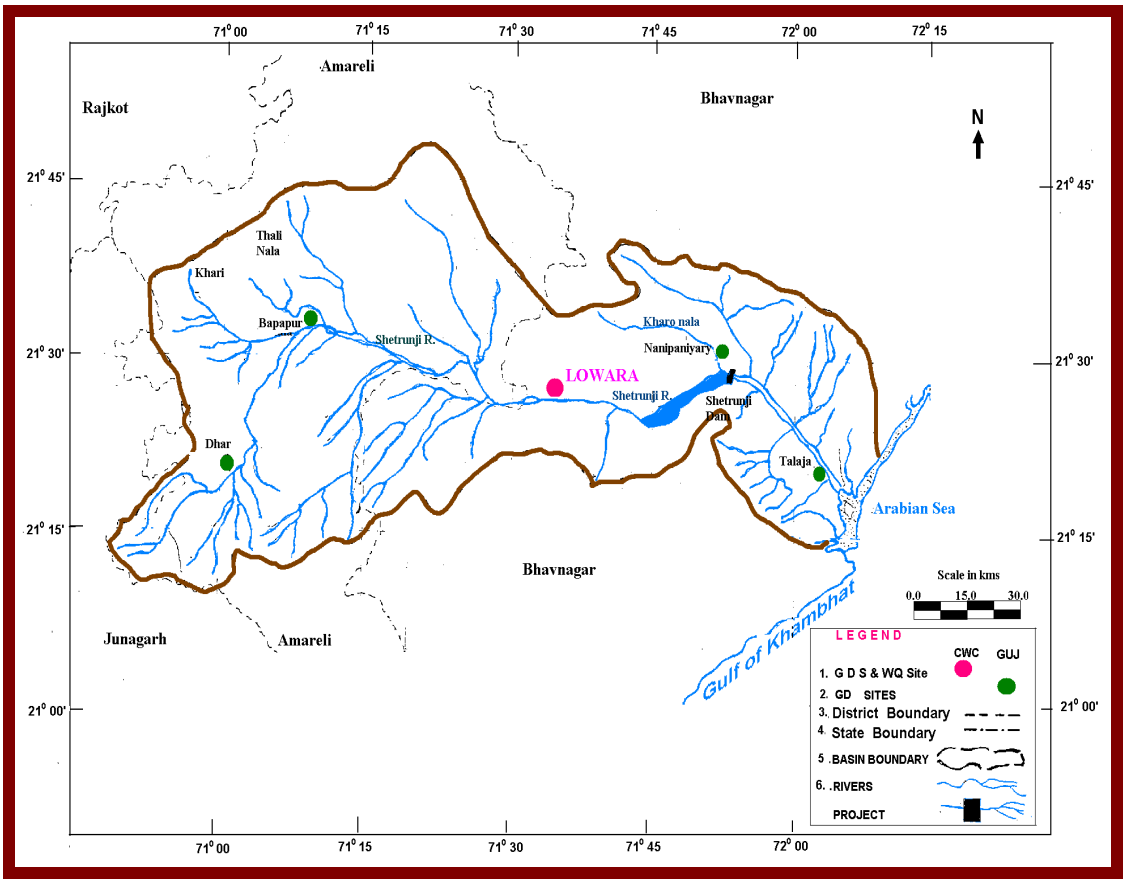
Sr No	Name	Local River	Lat.	Long.	Stn Parameters			Silt lab	Type of gauge	Discharge measure-ment
			D M S	D M S	Met	Gauge	WQ			
1	Lowara	Shetrunji	21 26 36	71 33 42	SRG	GDS	WQ	Silt lab	Staff G	Wading, boat, float

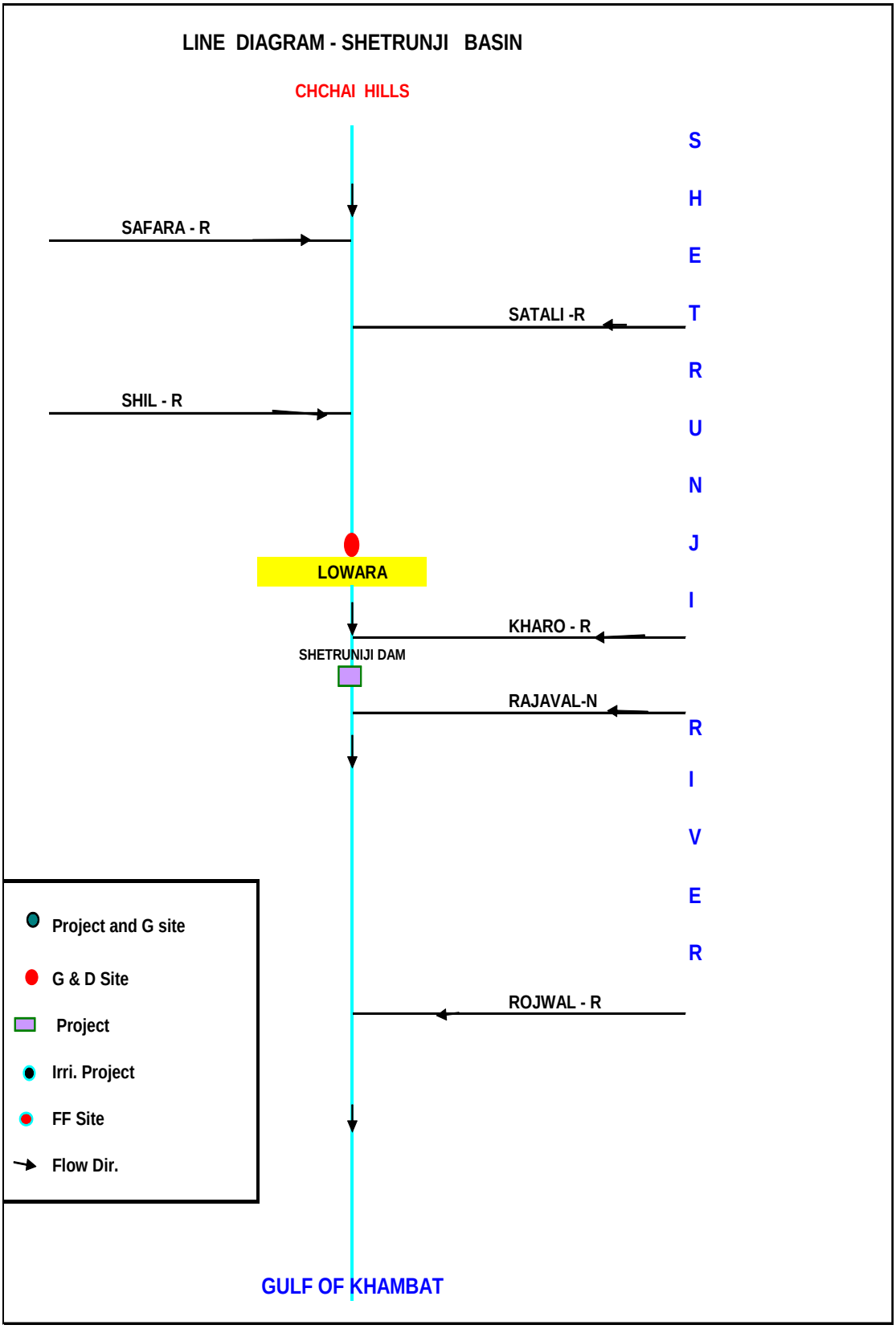
2.5.6 Data availability

Sl No	Site name	Rain fall	Discharge	Thrice daily water level	Hourly water level (for Monsoon period only)	Sedi-ment	Water quality
1	Shetrunji at Lowara GDSQ	June-89	Nov -70	Nov -70	June -71	July -73	July-77

Plate-2.5.1

Shetrunji Basin




LINE DIAGRAM - SHETRUNJI BASIN
CHCHAI HILLS
SHETRUNJI RIVER
SAFARA - R
SATALI -R
SHIL - R
LOWARA
KHARO - R
SHETRUNJI DAM
RAJAVAL-N
ROJWAL - R
GULF OF KHAMBAT
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.

2.6 Bhadar Basin

2.6.1 Geographical description of the Basin

Bhadar is one of the major rivers of Saurashtra. It drains about 1/7 th of the area of Saurashtra. The Bhadar basin is the South-Western basin and situated between 21^0 25' to 22^0 10' north latitude and 69^0 45' to 71^0 20' east longitude. The river Bhadar originates at an elevation of 261 m above m.s.l. in Vaddi about 26 km North-West of Jasdan in Rajkot district and flows towards south upto Jasdan village and then turns towards South-West up to village Jetpur and finally changes its direction towards West till its confluence with Arabian sea at Navibandar (Porbandar). Thus, from Jetpur to Porbandar the river Bhadar makes fertile areas of Rajkot, Jamnagar, Amreli and Junagarh districts of Saurashtra. The Bhadar drains an area of 7094 sqkm out of which 706 sqkm in hilly and the rest in plain regions of Saurastra. Basin map of Bhadar basin is enclosed is enclosed as **Plate -2.6.1.**

The district wise distribution of drainage area is shown in the following table

Name of district	**Drainage area sq km**	**% of total**
1. Rajkot	4902.67	69.11
2. Jamnagar	1047.78	14.77
3. Amreli	715.78	10.09
4. Junagarh	427.77	6.03
Total	7094	100

2.6.2 Description of River system

The total length of this South- West flowing river from its origin to its outfall into the sea is 198 km. For the first 150 km the river flows in Rajkot district and the rest of 48 km in Junagarh district. The river receives tidal influence for a length of about 26 km from mouth in Junagarh district. The river Bhadar receives several tributaries on both the banks. There are 9 major tributaries out of which 6 tributaries viz Gondali, Chapparwadi, Phopal, Utawali, Moj and Venu are feeding from right and the remaining 3 tributaries viz Vasavadi, Surwa and Galolia from left. The drainage system on the right bank of river Bhadar is more extensive as compared to the left bank.

Gondali, Chapperwadi, Phopal and Venu, these 4 important right bank tributaries together account for nearly 35% of total catchment area of Bhadar. Venu, which is the principal

tributary of Bhadar also rises in Jamnagar district in hilly range and drains Jamnagar and Rajkot districts. Phopal, another tributary rises at high level range about 5 km north of the town Lodhika. The catchment area, length and elevation of sources of important tributaries are indicated below

Sl.no.	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area (sqkm)
1	Bhadar	Main	261	198	7094
2	Vasavadi	Left	194	32.18	583
3	Gondali	Right	231	46.66	513.85
4	Surwa	Left	180	30.6	273.6
5	Galolio	Left	160	27	198.25
6	Chappervadi	Right	180	43.45	455.4
7	Phopal	Right	175	48.27	590.5
8	Utawali	Right	146	24	103.6
9	Moj	Right	245	48.27	105.15
10	Venu	Right	180	61.15	953.12

A line diagram of river system giving information of Bhadar basin, its tributories and sub-tributories etc. indicating the stations showing diversions, etc. is enclosed as **Plate -2.6.2.**

2.6.3 Climatic characterstics:

The average rainfall in Bhadar Basin is 625 mm. The south west Monsoon sets in by the middle of June and withdraws by the first week of October. About 90% of total rainfall is received during July and August. Owing to the topographical characteristics climate is variable

Temperature (°C) during year 2016-17

Ganod		
Year	Max. (°C)	Min. (°C)
2016-17	47	7

Mean annual rainfall (mm) for Bhadar Basin (CWC sites)

Name of site	Data available (No. of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Ganod	36	663	14	676.3	30

2.6.4 Description of the water storage / diversion structures

Medium irrigation projects in Bhadar River Basin

At present there are 12 completed structures either reservoirs or weirs in Bhadar catchment which are as follows:

1. Jasdan tank (Alansagar)
2. Gondali Irrigation Scheme (near Kotesangani)
3. Gondali Irrigation Scheme (Veri tank)
4. Sekroli Irrigation Scheme
5. Moj dam
6. Venu dam
7. Venu dam-II
8. Phualjar Irrigation Scheme
9. Mewasa bund
10. Rajawadla tank
11. Hamir barrage
12. Bhadar dam

The Bhadar irrigation scheme is on the Bhadar River in Rajkot .The gross storage capacity is 238 MCM and tributary storage capacity is 221 MCM. The cost of project is Rs 4.5475 crores.

2.6.5 Streamflow data

Hydrological observations by CWC

In Bhadar basin, Central Water Commission is conducting hydrological observations i.e. Gauge and discharge observation at site Ganod for which data has been finalised and presented in this book. The details of this site are given below.

Sl.no.	Name of site	Station code	Scheme	Type
1.	Bhadar at Ganod	01 02 07 001	NNW	GDSWQ

Salient features of sites maintained by CWC in Bhadar Basin

Sr No	Name	Local River	Lat. D M S	Long. D M S	Stn Met	Stn. Gauge	Stn WQ	Silt lab	Type of gauge	Discharge Measurement
1	Ganod	Bhadar	21 39 53	70 10 52	SRG	GDS	WQ	Silt lab	Staff G	Wading, boat, float

2.6.6 Data availability

Sl. No	Site name	Rain fall	Discharge	Thrice daily water level	Hourly water level (for Monsoon period only)	Sediment	Water quality
1	Bhadar at Ganod GDSWQ	June-81	Nov -70	Nov-70	June -71	July -73	July -77

Plate-2.6.2

Bhadar Basin

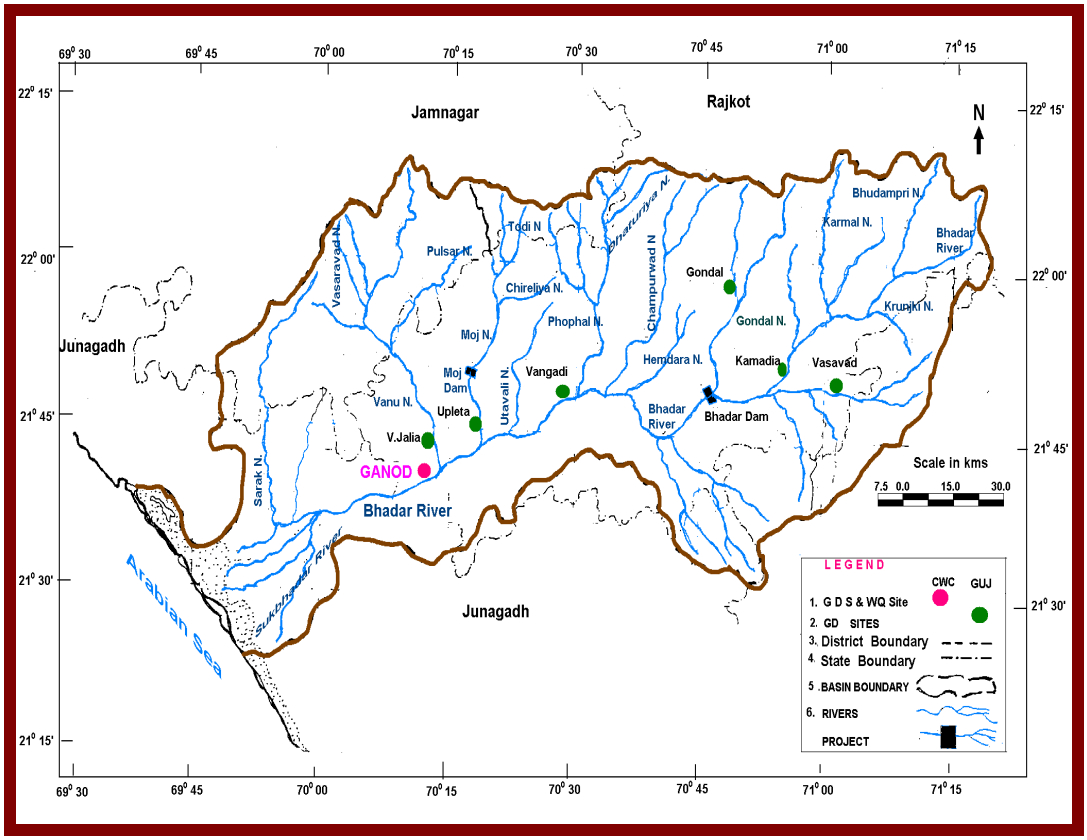
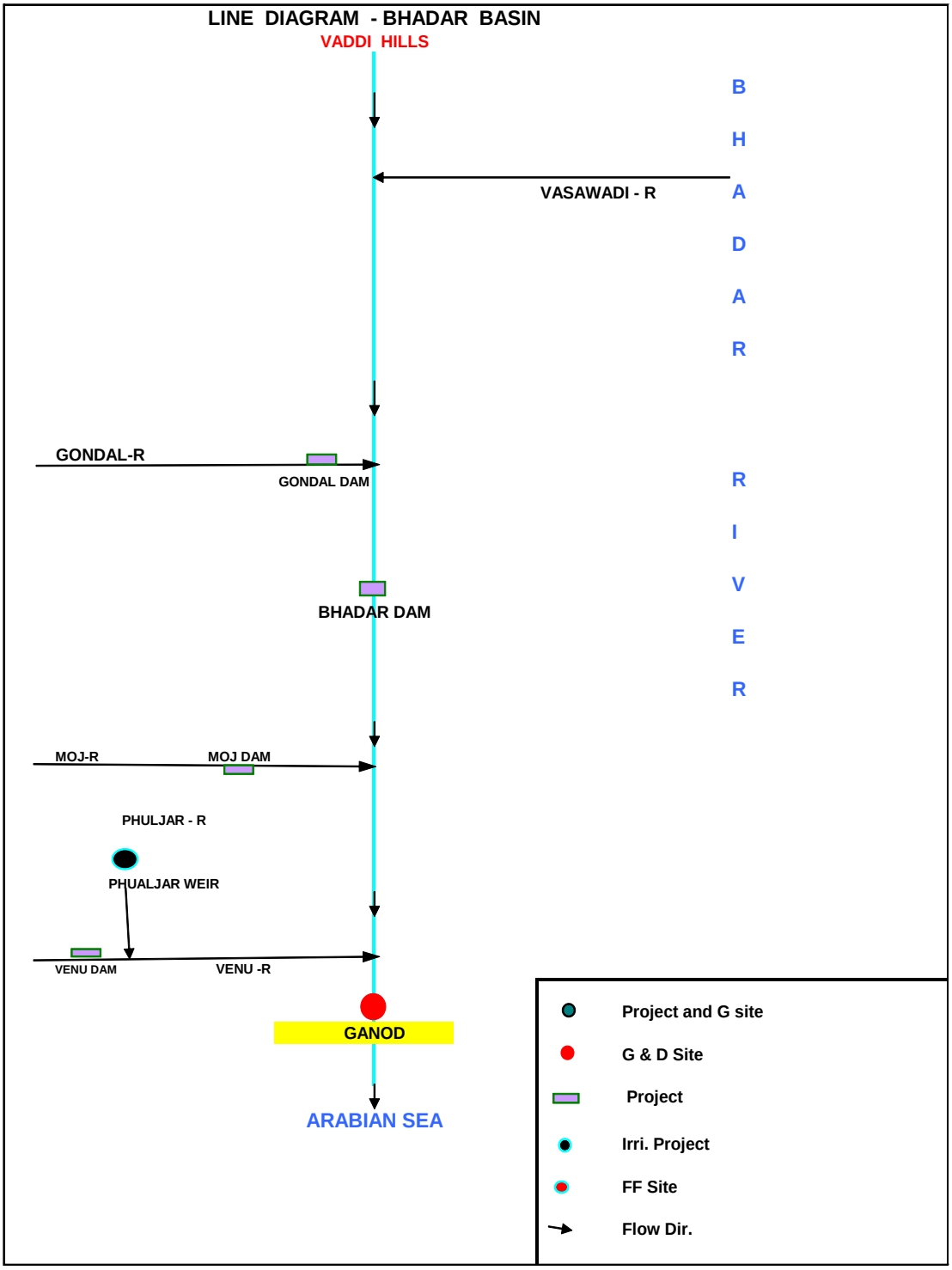


Plate-2.6.2


LINE DIAGRAM - BHADAR BASIN
VADDI HILLS
B
H
A
D
A
R
VASAWADI - R
GONDAL-R
GONDAL DAM
R
I
V
E
R
BHADAR DAM
MOJ-R
MOJ DAM
PHULJAR - R
PHUALJAR WEIR
VENU DAM
VENU -R
GANOD
ARABIAN SEA
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.

2.7 Machhu Basin

2.7.1 Geographical description of the Basin

Machhu river rises in the hills of Jasdan near village Khokhara in Chotila taluk of Surendranagar districts at an elevation of 220 m above m.s.l. This is one of the North flowing rivers of Saurashtra in Gujarat state. The Machhu basin is situated between 22^0 10 to 23^0 10' north latitude and 70^0 40' to 71^0 15' east longitude. The river Machhu originates from the hill ranges of Jasdan Sardar and Mandva in Rajkot district and Chotila in Surendranagar district and flows in north westerly direction along the district boundry of Surendranagar and Rajkot upto village Beti and then flows mostly towards north in Rajkot district and finally disappears near Malia in the little Rann of Kachchh. Machhu alongwith its tributaries flows 52 % in the hilly area and 48 % in plain region. The river makes fertile areas of Malia, Morbi, Wankaner, Jasdan and Rajkot taluks of Rajkot districts and part of Chotila taluk in Surendranagar district. Machhu drains an area of 2515 sqkm out of which more than 75 % lies in Rajkot district. Basin map is enclosed as **Plate -2.7.1**

The district wise distribution is shown as below

Name of district	**Drainage area sq km**	**% of total**
1. Rajkot	1924	76.51
2. Surendranagar	591	23.49
Total	2515	100.00

2.7.2 Description of River system

The total length of this North flowing river from its origin to its outfall into the little Rann of Katchch is 141.75 km. Machhu receives several tributaries on both the banks. There are 6 major tributaries out of which 4 tributaries namely Jamburi, Benia, Machhori and Maha feed from the right and the remaining 2 tributories namely Beti and Asoi from the left. The drainage system on the right bank of Machhu is more extensive as compared to the left bank.

The Beti, Asoi, Machhori and Maha, the 4 important tributaries together account for nearly 42.52% of the total catchment area of Machhu. Maha, the principal tributari, rises from Rampura in Chotila taluk of Surendranagar district and drains in north western direction and

fertiles Surendranagar and Rajkot districts and joins main stream Machhu about 1.6. km downstream of Panchaisa village.

Machhori the another important tributari also rises from Chotila taluka and drains towards north direction and meets the main stream about 8.5 km downstream of wankaner in Rajkot district. Asoi tributari rises from the hilly region of village vanjhara of wankaner taluka and drains towards north direction and meets the main stream just upstream of village derali.

The catchment area, length and elevation of sources of important tributaries are given below.

Sl.no.	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area (sqkm)
1	Machhu	Main	220	141.75	2515.00
2	Beti	Left	280	28.00	235.69
3	Jampuri	Right	300	27.36	119.14
4	Bania	Right	300	27.36	113.96
5	Machhori	Right	260	26.00	140.62
6	Asoi	Left	140	25.75	197.84
7	Maha	Right	200	45.06	507.64

A line diagram of river system giving information of Machhu Basin, its tributaries and sub tributaries etc. indicating the stations showing diversions, flows at terminal sites is enclosed as **Plate -2.7.2.**

2.7.3 Climatic characterstics

The average rainfall in the Machhu Basin is 533.5mm. The south west Monsoon sets in by the middle of June and withdraws by the first week of October. Owing to the topographical characteristics, the climate is variable.

Temperature (°C) during year 2016-17

Gungan		
Year	Max. (°C)	Min. (°C)
2016-17	41	14

Mean annual rainfall in mm Machhu Basin CWC site

Name of site	Data available (No of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Gungan	29	564	12	370	17

2.7.4 Description of the water storage / diversion structures

Medium irrigation projrcts in River Basin Machhu

At present there are five medium irrigation schemes completed in the catchment of Machhu.

1 Adhia Irrigation Scheme
2 Kuvadva Irrigation Scheme
3 Ghunda Irrigation Scheme
4 Machhora Irrigation Scheme
5 Vadsar and Amarsar Irrigation Scheme.

There are two important Irrigation Schemes viz Machhu-I & Machhu-II. Machhu Irrigation Scheme-I is on river Machhu in Wankaner taluka of district Rajkot. The gross storage capacity of this dam at FRL is 72.74 Mm^3, having 70.8 Mm^3 as effective storage capacity. The cost of this project is Rs.1.5404 crore.

Machhu Irrigation Scheme-II is on Machhu in Morbi taluka of district Rajkot.The gross storage capacity of this dam is 100.55 Mm^3, having 90.8 Mm^3 as effective storage capacity. The estimated cost of this project was 31.61 crore.

2.7.5 Streamflow data

Hydrological observations by CWC

In Machhu basin, Central Water Commission is conducting hydrological observations i.e. Gauge and discharge observation at site Gungan .

The details of this site are given below:-

Sl.No.	**Name of site**	**Station code**	**Scheme**	**Type**
1.	Machhu at Gungan	01 02 03 001	NNW	GD

Salient features of sites maintained by CWC in Machhu Basin

Sl No	Name	Local River	Lat. N D M S	Long. E D M S	Stn Met	Stn. Gauge	Stn WQ	Silt lab	Type of gauge	Discharge Measurement
1	Gungan	Machhu	22 57 42	70 45 52	SRG	GD	---	--	Staff G	Wading, boat,float

2.7.6 Data availability

Sl. No	Site name	Rain fall	Discharge	Thrice daily water level	Hourly water level (for Monsoon period only)
1	Machhu at Gungan GD	June -88	Dec -70	Sep -70	Sep -70

Plate-2.7.1

Machhu Basin

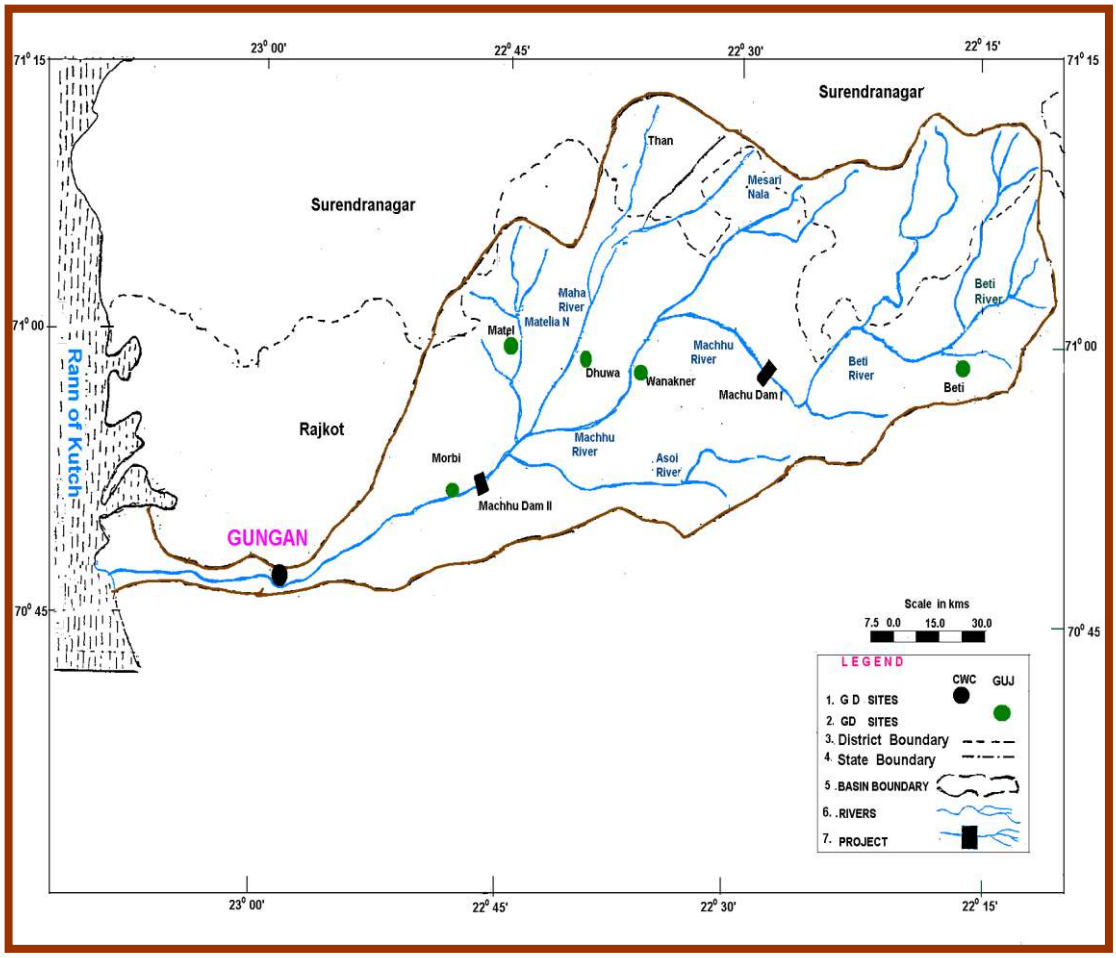
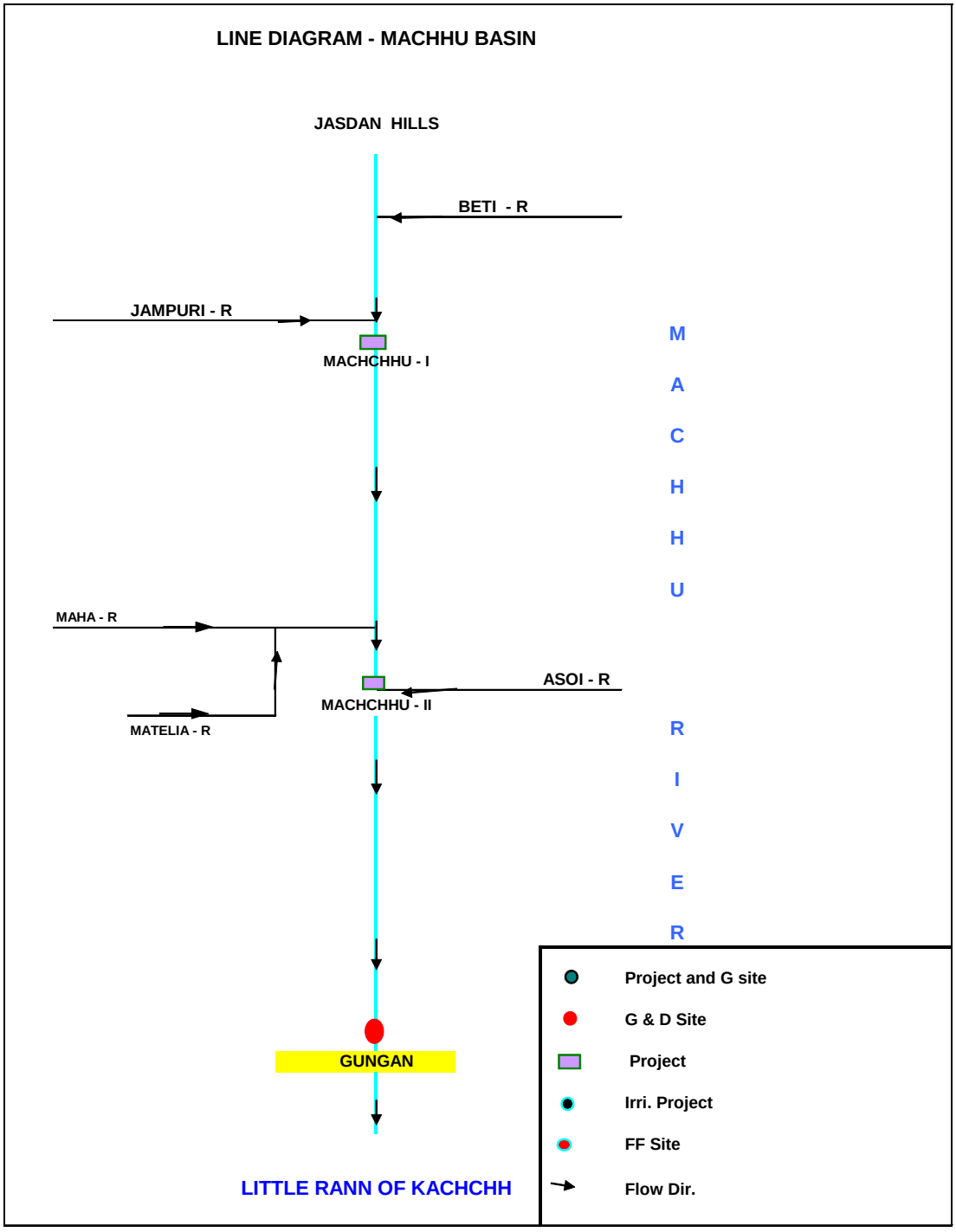


Plate-2.7.1


LINE DIAGRAM - MACHHU BASIN
JASDAN HILLS
BETI - R
JAMPURI - R
MACHCHHU - I
MAHA - R
ASOI - R
MACHCHHU - II
MATELIA - R
GUNGAN
LITTLE RANN OF KACHCHH
M A C H H U R I V E R
Project and G site
G & D Site
Project
Irri. Project
FF Site
Flow Dir.

2.8 Rupen Basin

2.8.1 Geographical description of the Basin

Rupen river originates from Taranga hill ranges near Kheralu taluka of Mehsana district in Gujarat at an elevation of 180 m above m.s.l. and decends in south western direction and travels through Mehsana district before it drains into little Rann of Kachchh. The Rupen Basin is a northern Basin of Gujarat and is situated between 23^0 25' to 24^0 00' north latitude and 71^0 30' to 72^0 46' east longitude approx. Basin map of Machhu Basin is enclosed is enclosed as **Plate -2.8.1**

2.8.2 Description of River system

Pushpavathi and Khari the two right bank tributaries of Rupen river, drains into the main channel. There is only one left bank tributary namely Khari. Hence the drainage system on the right bank of Rupen river is more extensive as compared to left bank area.

Pushpavathi and Khari are the two important tributaries which together drain nearly 24.6 % of the total catchment area of Rupen river. Pushpavathi is the principal tributary of Rupen rising from the hilly ranges upstream of Balad village of Kheralu taluk, in Mehsana district of Gujarat at an elevation of 183 m above m.s.l. Pushpavathi meets the main river Rupen at upstream of village Sapawada.The catchment area, length and elevation of sources of the above three tributaries are as shown below.

Sl.no.	Name of River	Bank	Elevation of source above m.s.l. (m)	Length (km)	Catchment area (sq km)
1	Rupen	Main	180	156	2500
2	Khari	Left	131	59	180
3	Pushpavati	Right	183	68	446
4	Khari	Right	53	46	170

A line diagram of river system giving information of Rupen basin, its tributories and sub-tributories etc indicating the stations showing diveRsions is enclosed as **Plate -2.8.2.**

2.8.3 Climatic characterstics

The south west monsoon sets in the last week of June and withdraws by the end of September. Owing to the topographical characteristics the climate is variable.

Temperature (°C) during year 2016-17

Sapawada		
Year	Max. (°C)	Min. (°C)
2016-17	41	15

Mean annual rainfall in mm Rupen Basin CWC site

Name of site	Data available (No. of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Sapawada	26	592	15	512.1	23

2.8.4 Streamflow data

Hydrological observations by CWC

In Rupen Basin, the CWC is conducting hydrological observations at Sapawada.

The details of this site are given below.

Sl.no.	Name of site	Statin code	Scheme	Type
1.	Rupen at Sapawada	01 02 04 001	163 key	GD

Salient features of sites maintained by CWC in Rupen Basin

Sr No	Location Name	River	Lat. N D M S	Long. E D M S	Stn Met	Stn. Gauge	Stn WQ	Silt lab	Type of gauge	Mode of Discharge Measure-ment
1	Sapawada	Rupen	23 32 54	72 00 52	SRG	GD	--	----	Staff G	Wading, float

2.8.5 Data availability

Availability of gauge and discharge data of c.w.c sites in Rupen Basin.

Sl No	Site name	Rain fall	Discharge	Thrice daily water level	Hourly water level (for Monsoon period only)	Sediment	Water quality
1	Rupen at Sapawada	June '91	Aug '89	Aug '89	Aug '89	Not available	Not available

Plate-2.8.1

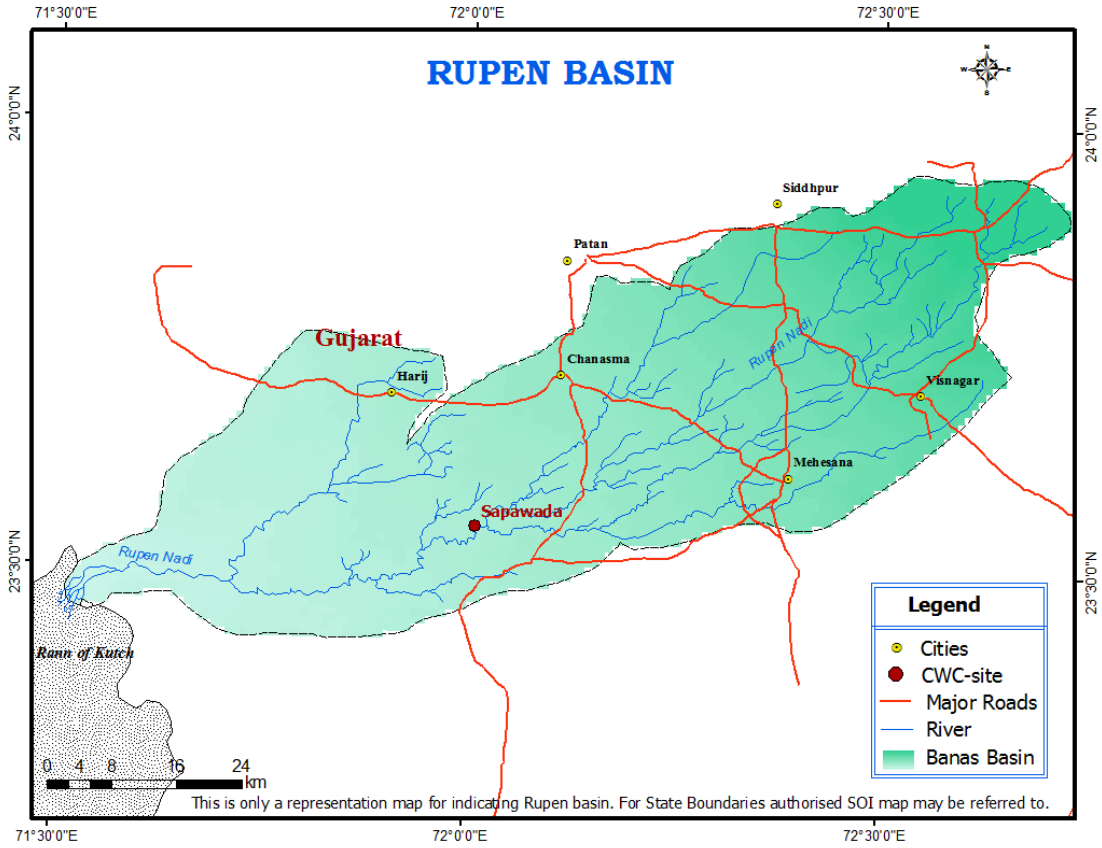
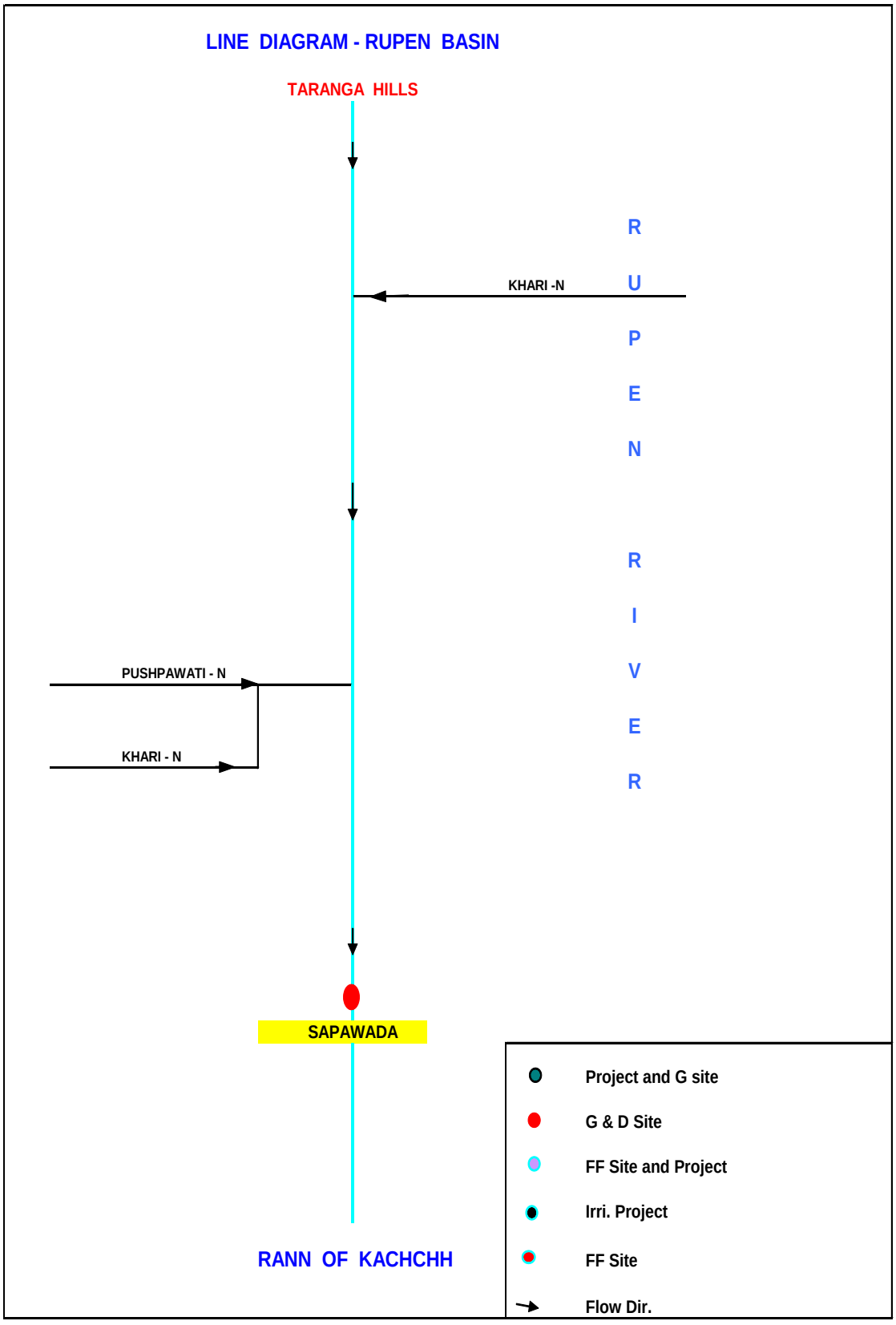


Plate-2.8.2


LINE DIAGRAM - RUPEN BASIN
TARANGA HILLS
KHARI -N
R
U
P
E
N
R
I
V
E
R
PUSHPAWATI - N
KHARI - N
SAPAWADA
RANN OF KACHCHH
Project and G site
G & D Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

2.9 Machhundri Basin

2.9.1 Geographical description of the Basin

Machhundri river originates from Gir forest & meets in Arebian sea. Its length is 59 km. & catchment area 406 sq.km. Machhundri dam is situated on this river having 218 sqkm. catchment area. Basin map of Machhundri Basin is enclosed as **Plate -2.9.1**

2.9.2 Climatic characterstics

The south west monsoon sets in the last week of June and withdraws by the end of September. Owing to the topographical characteristics the climate is variable.

Mean annual rainfall in mm Machhundri Basin CWC site

Name of site	Data available (No. of years)	Average rainfall (mm)	Average no. of rainy days	Rainfall during water year (mm)	No of rainy days
				2016-17	2016-17
Una	2	740	46	777.8	57

2.8.4 Streamflow data

Hydrological observations by CWC

In Machhundri Basin, the CWC is conducting hydrological observations at Una.

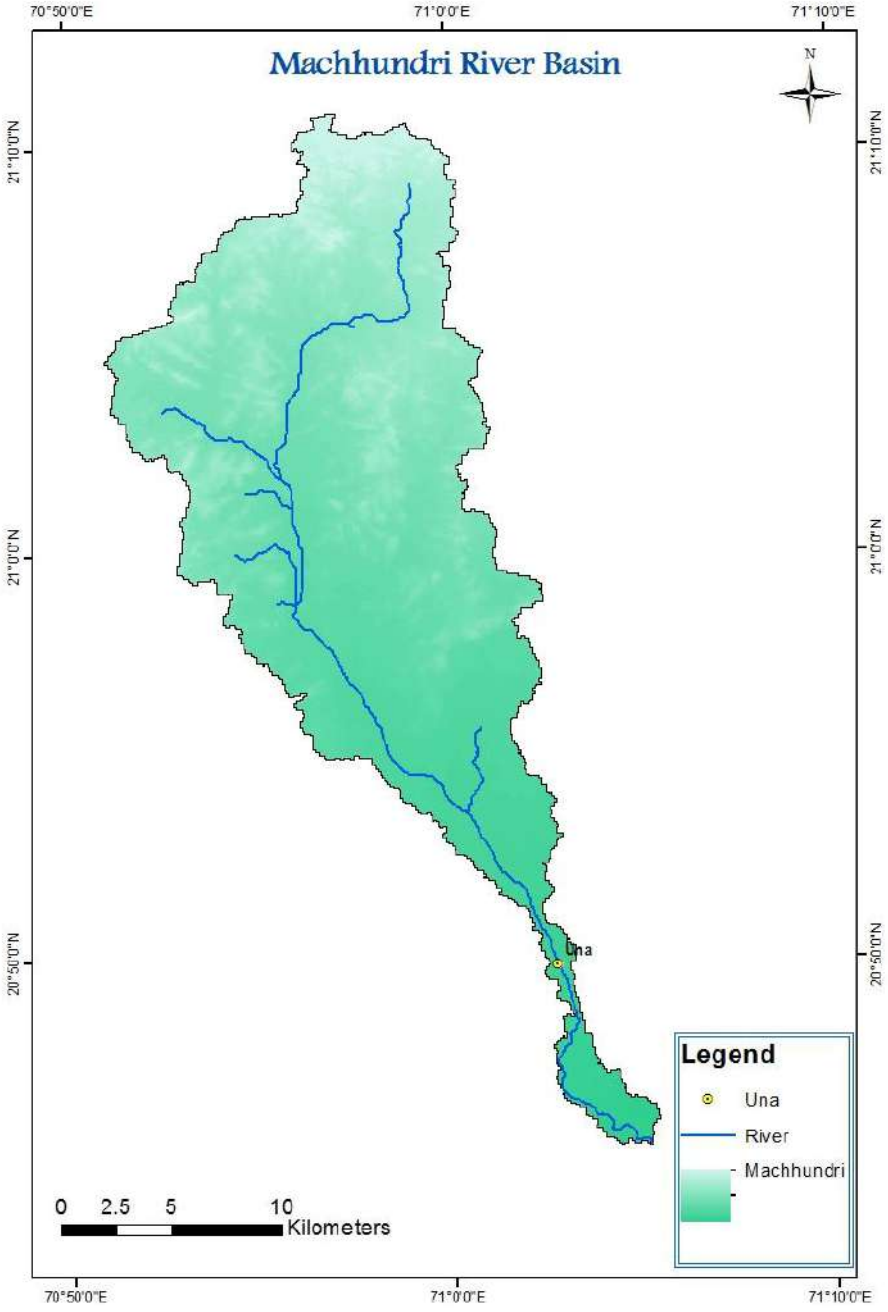
The details of this site are given below.

Sl.no.	Name of site	Statin code	Scheme	Type
1.	Machhundri at Una	01 02 14 001	2701DWRIS	GD

Salient features of sites maintained by CWC in Machhundri Basin

Sr No	Location Name	River	Lat. N D M S	Long. E D M S	Stn	Stn.	Type of gauge	Mode of Discharge Measurement
					Met	Gauge		
1	Una	Machhundri	20 49 42	71 02 51	SRG	GD	Staff G	Wading, bridge, float

Plate – 2.9.1



3.0 Hydrological observations by State Government

Source of information

Apart from the sites maintained by central water commission the state government of Gujarat, Madhya Pradesh, Rajasthan and Maharashtra are also conducting gauge and discharge observations in among 14 Basins. The Basin wise list of sites and the authority maintaining the sites are listed in the following para.

Basin wise list of sites

Sl. no	Name of Basin	Name of site		Site maintained by
1	Mahi Basin	1 Mahi	At Vasad	Sup. Engineer, WRI
		2 Bhadar	At Khanpur	Circle I, LD Engg.
		3 Bhadar	At Undva	College campus, nr.
		4 Machhan	At Davadia	Gujarat university,
		5 Machhan	At Limdi (Wankol)	Ahmedabad
		6 Hadaf	At Morva	&
		7 Kabutari	At Vadosar	Executive engineer
		8 Panam	At Sant Road	WRI divn., Bhadra
		9 Goma	At Kalol	Fort, Laldarwaja,
		10 Mahi	At Anklav	Ahmedabad Gujarat
		11 Mahi	At Borsad	
		12 Mahi	At Gamla	Superintending
		13 Goma	At Sureli	Engineer, Jakham
		14 Kun	At Khandia	Irrigation circle,
		15 Koliyari	At Rampur	Udaipur, Rajasthan
		16 Wankadi	At Wankadi	
		17 Jakham	At Dhariwad	Chief Engineer,
		18 Jakham	At Nagalia Pickup Weir	Mahi Bajaj Sagar
		19 Jakham	At Karmai Pickup Weir	project , Banswada,
		20 Mahi	At Mahi Dam	Rajasthan
		21 Mahi	At Chandangarh	
		22 Mahi	At Ratangarh	Chief Engineer,
		23 Mahi	At Bhairongarh	survey & Irrigation

		24 Anas	At Anas I	(major projects)
		25 Anas	At Anas Ii	Irrigation dept. E-3 /
		26 Pantalla	At Parwalia	28 - a, Arora colony,
		27 Bhunand	At Sangam	near bus stop II,
		28 Pampawati	At Larki	Bhopal, Madhya
		29 Undwa Nallah	At Ranisingh	Pradesh
	Note: Following River gauge stations are closed from 1st June 2006 *1 Bhadar at Vegadi 2 Aaji-iii at Tarana 3 Jolapuri at Jolapur*			

Name of Basin		**Name of site**	**Site maintained by**
2	Sabarmati Basin	1.Sabarmati At Gandhinagar(Borij) 2.Sabarmati At Subhash Bridge 3.Sabarmati At Derol Bridge 4.Sabarmati At Kheroj 5.Sabarmati At Balwa 6.Abarmati At Dharoil 7.Sabarmati At Kalol 8.Sabarmati At Kanewal 9.Sabarmati At Mhij 10.Sabarmati At Mansa 11.Sabarmati At Nallake 12.Sabarmati At Rasikpur 13.Sabarmati At Red Lazximipura 14.Siri At Ganpipali 15.Dhamini At Momanwas 16.Harnav At Khedbrahma 17.Harnav A Abhapur 18.Guhai At Kadiadra 19.Guhai At Rampur 20.Guhai At Khandiol 21.Vekri At Mathasur 22.Hathmati At Bhiloda	Supt,engineer, WRI circle-I, L.D.Engg.college campus near Gujarat University, Ahmedabad & Executive Engineer, WRI Division, Bhadra Fort, Laldarwaz, Ahmedabad (Gujarat)

		23.Hathmati At Balochpur 24.Hathmati At Himatnagar 25.Hathmati At Mankadi 26.Hathmati At Pal 27.Khari At Prntij 28.Khari At Raipur 29.Meshwo At Kabola 30.Meshwo At Mithajinamuwada 31.Majam At Ambaliyara 32.Majam At Modasa 33.Watrak At Dhabha 34.Watrak At Memdabad 35.Watrak At Bayad 36.Watrak At Meghraj 37.Watrak At Bempoda 38.Khari At Magodi 39.Warasi At Betawada 40.Mahor At Katlal 41.Mahor At Mahadevpura-Mahadevia 42.Shedi At Bilodra 43.Shedi At Dakor	

3	Luni Basin	1 Luni At Luni 2 Luni At Latoti 3 Luni At Alniawas 4 Sagi At Sewadi 5 Bandi At Gadi 6 Bandi At Santhu 7 Rel At Ramsen 8 Sukri At Leta 9 Jawai At Shivganj 10 Sukri At Ghana 11 Khardi At Pali	Executive Engineer Planning & Co - ordination Division I, Adarsh nagar, Raja park, Jaipur, Rajasthan

		12 Mithri At Auwa 13 Rediya At Singari 14 Sukri At Bagri 15Mithri- At Pipar Jojri 16 Lilri At Banjakudi	
4	Banas Basin	1 Banas At Roho 2 Banas At Deesa 3 Banas At Umari 4 Banas At Balundra 5 Banas At Dantiwada Dam 6 Banas At Gadh 7 Banas At Wav 8 Banas At Zerda 9 Sipu At Panthawada 10 Sipu At Bhakudar 11 Balaram At Chitrasani	Sup. Engineer, WRI Circle I, LD Engg. College Campus, near Gujarat University, Ahmedabad & Executive Engineer WRI divn., Bhadra Fort, Laldarwaja, Ahmedabad Gujarat
5	Shetrunji Basin	1 Shetrunji At talaja 2 Shetrunji At dhari 3 Shetrunji At gariyadhar 4 Shetrunji At gopnath 5 Shetrunji At jesar 6 Shetrunji At lathi 7 Rajwal At makhadka 8 kharo At nanipaniyari 9 satli At babapur	Sup. Engineer, WRI Circle I, LD Engg. College Campus, near Gujarat University, Ahmedabad & Executive Engineer WRI divn., Bhadra fort, Laldarwaja, Ahmedabad Gujarat
6	Bhadar Basin	1 Bhadar At Vangadi 2 Bhadar At Kamadhia 3 Bhadar At Chhaparvadi-Ii 4 Bhadar At Dhandhuka 5 Bhadar At Jasdan 6 Bhadar At Kukavav 7 Minsar At Rana-Kandorana 8 Venu Ii At Warjan Jaliya 9 Moj At Upleta 10 Gondali At Gondal 11 Vasawadi At Vasavad	Sup. Engineer, WRI Circle I, LD Engg. College Campus, near Gujarat University, Ahmedabad & Executive Engineer WRI Divn., Bhadra fort, Laldarwaja, Ahmedabad Gujarat
7	Machhu Basin	1 Machhu At Morbi 2 Machhu At Wankaner 3 Machhu At Beti 4 Machhu At Chotila 5 Asoi At Sindhavadar 6 Maha At Dhuwa 7 Matelia At Matel	Sup. Engineer, WRI Circle I, LD Engg. College campus, Near Gujarat University, Ahmedabad & Executive Engineer WRI Divn., Bhadra Fort, Laldarwaja, Ahmedabad Gujarat

8	Rupen Basin	1 Rupen At Delwada 2 Rupen At Valam Ashram 3 Rupen At Dhinoj 4 Rupen At Ranuj 5 Rupen At Viramgam 6 Pushpavati At Aithor 7 Khari At Zillia 8 Khari At Mehsana	Sup. Engineer, WRI Circle I, LD engg. College campus, Near Gujarat University, Ahmedabad & Executive Engineer WRI Divn., Bhadra Fort, Laldarwaja, Ahmedabad, Gujarat

3.1 Methodology: Streamflow measurement

3.1.1 Gauge measurement

Water level or stage of the river is measured as its elevation above the GTS datum. Water level measurement was conducted by reading non-recording gauges. A series of vertical staff gauges as per the specifications laid down in is 4080-1977 have been fixed at three sections at each site i.e. Upstream, station gauge and downstream. The gauge posts are of r.c.c/wooden/ metallic with cut and edge wateRs and are fixed securely in position by installing them in m-150 concrete blocks of suitable size. Enamelled gauge plate with marking in metric unit is fixed on the gauge posts with least count 0.005 m, out of the three gauge lines the central line is used as station gauge line and readings of the other two lines are used for calculating the surface slope. The gauges were read hourly during Monsoon season and three hourly i.e. 0800, 1300 and 1800 hRs., during non Monsoon season at station gauge line.

3.1.2 Discharge observation

Discharge observation is conducted once a day at 0800 hrs, at all the sites by area velocity method except on Sunday and holidays in non Monsoon period. However additional observations were conducted during floods to cover different stages, irrespective of holidays.The river width is generally 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/metallic tape or wire rope stretched across the river with segment markings indicated thereon, when the river width is quite small and the flow depths permit wading. For larger width and deeper flow conditions and in unmanageable flood conditions segment points vertically are located by measuring the navigation craft with reference to pivot point and segment blocks constructed at sites.the depth measurement is carried out by using sounding rod for depths up to 3 metres and by using long bamboos for depths between 3 metres and 6 metres. For depths exceeding 6 metres sounding reel measurements at segment points are resorted to, and in Some cases, the depths are measured by echo sounder or are computed from the most recent x-sections of the

river.The velocity is measured as per IS: 3918 - 1976 by using a cup type current meter conforming to IS: 3910 - 1976. The current meter is lowered to the requisite depth i.e. 0.6 of total depth down the vertical at every segment point by suspension equipment as specified in IS: 6064 - 1981 and where the depth is less than 0.3 metres, the velocity is observed just below the water surface in medium and high stages with significant flow velocities, boats fitted with power engines are used. Measurements of velocity are sometimes carried out from the bridges when the River flow condition does not permit the boat to be kept stable for velocity observation. When none of the above procedures are possible, the velocity is measured by float observations.

The data observed as above at the site is entered in the prescribed standard format to compute the total River discharge and it is further scrutinised at various levels before finalisation.
The daily observed/estimated discharge data is presented in this book.

Equipment used for observation:

Sl. No	Name of equipment	By wading	By boat	Bridge	By float
1	Current meter	√	√	√	X
2	Pigmy current meter	√	X	X	X
3	Stop watch	√	√	√	√
4	Wading rod	√	X	X	X
5	Nylon rope & tag	√	X	X	X
6	Measuring tape	√	X	X	X
7	Protractor	√	√	√	X
8	Ranging rod	√	√	X	√
9	Sounding rod	√	√	X	X
10	Automatic battery counter	√	√	√	X
11	Thermometer	√	√	√	√
12	Prismatic compass	X	X	X	√
13	Balloon	X	X	X	√
14	Sounding cable with fish weight	X	√	X	X
15	Echo sounder	X	√	√	X
16	Bridge out fit	X	X	√	X
17	Boat out fit	X	√	X	X

3.1.3 Explanatory notes

Explanatory notes given here have been designed to assist in the data 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 next calendar year and includes one complete hydrological cycle.

2. Discharge is given in cubic metres per second.

3. Discharges given are daily observed / estimated discharges.

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

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

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.

$$\text{Runoff (mm)} = \frac{\text{Annual runoff (Mm3)}}{\text{Catchment area (km}^2\text{)}} \times 1000$$

7. Peak and lowest flows 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 gauge station. The name of the division is abbreviated by taking first alphabet of the River name followed by alphabets "DN" for division. For example Mahi division is denoted by MDN. These abbreviations are given cross-reference in the list of abbreviations and symbols.

9. Gauging station code number is a unique nine-digit reference number, which facilitates retrieval of flow data in data bank. The first two digits denote the measuring authority. The third and fourth digits are the Basin/zone identifier and fifth and sixth digits are the independent River Basin identifier. The last three digits of the code number indicate gauging site no. which is given from origin to mouth.

11. The month and the year from which data are available in the data bank are indicated against the record available.

3.1.4 Method of presentation

The data presented in this book is processed discharge data obtained from application of SWDES/HYMOS software.

The stationwise hydrological data is presented comprising history sheet, daily flow table and pictorial summary.The sequence of hydrological station arranged from its outfall to origion giving inter-priority to an intermediate tribuetory station.

4.0 Hydrological data

The hydrological data presented hereby mainly consist of the following

History sheet

Its manly consist of some salient features of particular site as Site name, state, district, river basin, tributary, catchment area, latitude / logitude, opening / closing date for various types of data & maximum –minimum discharge values.

Data sheet

It consists of stage- discharge data (both observed & estimated from stage discharge curve for the season), for the current year with mean water level during the discharge observation and peak observed and computed discharge with corresponding water level with date during the year, lowest discharge with corresponding water level with date during the year, Peak discharge with corresponding water level with date since inception, Lowest discharge with corresponding water level with date since inception.

Stage discharge curve

It gives a relationship between the stage of the river and the corresponding discharge.

Annual run-off

It gives the value of Annual run off in MCM for all the years from the opening of the site.

Water level v/s time graph

Hourly observed water level for one to three important highest peak flood events of current Water Year covering the period well before the start and upto well beyond the completion of these flood events.

Charts / maps

Basin map showing sites / projects

The site-wise pre – Monsoon and post – Monsoon crossections

The site-wise Pie chart

Site-wise Bar charts

The site-wise hydrographs (flood events)

HISTORY SHEET

Water Year : 2016-17

Site	**:**	**Mahi at Khanpur**	**Code**	**:**	**01 02 13 012**
State	:	Gujarat	District		Anand
			Independent		
Basin	:	Mahi	River	:	Mahi
Tributary	:	Mahi	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Mahi
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Mahi Sub Divn., Kadana
Drainage Area	:	32510 Sq. Km.	Bank	:	Right
Latitude	:	22°31'55" N	Longitude	:	73°08'27" E
Zero of Gauge (m)	:	8.22 (m.s.l)	21/12/1978	-	
		Opening Date	Closing Date		
Gauge	:	21/12/1978			
Discharge	:	21/12/1978			
Sediment	:	01/05/1988			
Water Quality	:	01/01/1979			

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	6168	14.570	12/08/1979	3.800	8.600	17/04/1980
1980-1981	2417	14.005	01/09/1980	5.400	8.450	06/04/1981
1981-1982	9880	23.600	17/08/1981	4.300	8.625	06/04/1982
1982-1983	2121	13.605	19/08/1982	5.000	8.800	29/03/1983
1983-1984	4416	15.348	16/08/1983	0.300	8.660	08/05/1984
1984-1985	12880	21.810	20/08/1984	9.200	8.850	28/05/1985
1985-1986	1524	11.645	08/10/1985	7.700	8.845	30/05/1986
1986-1987	3652	15.570	16/08/1986	6.200	8.685	05/04/1987
1987-1988	5241	18.435	27/08/1987	2.670	8.567	14/07/1987
1988-1989	7515	19.295	06/08/1988	8.300	8.760	13/04/1989
1989-1990	2680	13.720	20/08/1989	7.989	8.935	30/05/1990
1990-1991	20127	26.320	24/08/1990	7.754	8.704	04/07/1990
1991-1992	10293	20.870	01/08/1991	8.571	8.690	23/05/1992
1992-1993	199.6	9.473	08/09/1992	8.747	8.740	12/03/1993
1993-1994	8391	19.295	18/07/1993	5.800	8.770	06/07/1993
1994-1995	16590	22.795	07/09/1994	12.00	8.600	23/06/1994
1995-1996	1022	10.920	31/07/1995	6.500	8.940	24/03/1996
1996-1997	7796	17.460	09/09/1996	11.00	9.080	30/03/1997
1997-1998	11956	21.370	02/08/1997	7.740	8.935	25/05/1998
1998-1999	5751	16.865	18/09/1998	10.00	9.010	06/09/1998
1999-2000	291.7	10.020	21/07/1999	4.785	8.680	29/04/2000
2000-2001	884.5	11.495	14/07/2000	2.844	8.850	03/01/2001
2001-2002	378.6	10.440	08/08/2001	4.845	8.830	21/07/2001
2002-2003	992.5	11.130	04/09/2002	1.490	8.870	15/03/2003
2003-2004	1677	12.210	27/09/2003	1.800	8.850	15/06/2003
2004-2005	9717	19.020	15/08/2004	10.00	9.070	25/07/2004
2005-2006	1675	12.750	03/08/2005	15.80	8.770	24/04/2006
2006-2007	31062	26.820	12/08/2006	17.150	8.770	03/07/2006
2007-2008	11480	21.235	10/07/2007	15.05	8.720	21/05/2008
2008-2009	441.7	10.690	13/08/2008	10.01	8.700	23/04/2009
2009-2010	465.4	10.850	31/08/2009	5.203	8.690	18/05/2010
2010-2011	1156	11.795	05/08/2010	3.273	8.750	31/05/2011
2011-2012	4362.8	15.240	13/09/2011	2.371	8.470	29/05/2012
2012-2013	12403.0	20.820	07/09/2012	2.346	8.470	06/06/2012
2013-2014	5348	16.695	03/08/2013	7.011	8.52	07/06/2013
2014-2015	4868	16.35	10/09/2014	8.482	8.29	25/04/2015
2015-2016	7091	16.14	29/07/2015	9.978	8.37	19/05/2016
2016-2017	13879	21.39	22/08/2016	7.483	8.36	31/05/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

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	8.460	13.26	8.580	18.85	8.775	33.52	10.970	587.3 #	9.445	205.2	8.760	61.06
2	8.460	11.80 *	8.540	16.80	8.865	43.78	13.450	1643	9.170	144.2 *	8.700	51.42
3	8.450	11.16 *	8.530	16.83 *	9.900	223.2	12.230	1118	10.525	807.5	8.610	45.10
4	8.450	11.16 *	8.520	15.78	9.450	123.9	10.950	692.7 *	10.280	660.1	8.490	21.00 #
5	8.440	10.53 *	10.240	374.2	9.825	206.2	10.550	681.1	10.510	825.5	8.390	12.79 #
6	8.440	10.53 *	9.320	131.8 *	9.510	144.8	10.735	917.0	10.350	668.2	8.400	13.51 *
7	8.440	11.99	8.845	34.40	9.580	192.4 *	10.310	675.6	10.685	938.6	8.420	20.66
8	8.440	11.87	8.625	21.03	9.615	134.5	10.315	670.4	10.490	836.5	8.420	20.55
9	8.440	11.85	8.520	18.39	9.980	260.2	9.945	476.1	10.180	583.4 *	8.420	20.54
10	8.440	12.03	8.480	13.15 *	9.960	262.0	9.515	258.4	10.070	502.5	8.450	20.80
11	8.420	11.16	8.470	14.49	11.920	939.2 #	9.450	233.2 *	9.970	464.4 *	8.480	23.74
12	8.420	9.370 *	8.575	19.21	12.825	2004	9.690	329.0 *	9.780	369.7 *	8.480	22.71
13	8.420	13.04	10.070	274.9	12.040	985.7 #	9.380	186.4	9.535	242.4	8.480	20.08 *
14	8.420	11.50	9.880	210.3	11.510	983.0 *	9.370	183.6	9.510	248.1	8.480	20.08 *
15	8.540	13.24	9.280	100.3	10.640	553.2 *	9.440	208.5	9.525	243.9	8.480	22.50
16	8.540	13.48	8.975	53.05	10.500	662.8	9.240	142.7	9.340	195.4 *	8.500	23.96
17	8.540	13.38	8.900	57.51 *	10.250	485.0	8.970	83.75	9.095	129.0	8.480	22.90
18	8.510	15.14	8.665	32.82	10.090	476.7	8.800	61.85 *	9.175	133.9	8.480	22.87
19	8.500	14.57 *	8.600	24.51	9.825	316.0	9.285	165.0	9.075	107.6	8.420	20.06
20	8.470	13.31	8.600	24.63	9.800	283.5	10.385	683.3	8.795	70.26	8.440	16.61 *
21	8.470	13.33	8.550	20.01	10.090	343.4 *	10.185	512.1	8.650	47.93	8.460	21.50
22	8.480	13.28	8.520	18.62	21.390	13879	9.760	388.6	8.625	46.36	8.460	20.95
23	8.480	13.14	8.490	18.57	14.440	3232 #	10.095	526.6	8.630	36.46 *	8.420	19.89
24	8.480	13.17	8.480	13.20 *	15.305	4196 #	10.285	613.1	8.885	78.04	8.420	19.15
25	8.510	14.00	8.480	18.46	13.390	2314 *	9.890	423.0 *	9.110	127.4	8.420	19.28
26	8.650	27.44 *	8.500	18.24	12.035	1602	9.865	441.1	8.960	92.46	8.460	20.19
27	8.530	14.53	8.820	39.57	11.645	1528	9.800	393.2	8.835	75.10	8.460	18.30 *
28	8.520	14.57	8.750	32.09	11.240	836.9 *	9.725	338.8	8.655	49.00	8.460	20.56
29	8.560	16.97	8.760	33.01	12.195	1992	9.600	276.0	8.480	20.08 #	8.460	20.84
30	8.600	19.00	8.730	33.23	11.470	765.1 #	9.535	264.7	8.420	15.01 *	8.460	20.46
31			8.710	33.74 *	10.900	563.8 #			8.700	46.01 #		
Ten-Daily Mean												
I Ten-Daily	8.446	11.62	8.820	66.13	9.546	162.4	10.897	772.0	10.170	617.2	8.506	28.74
II Ten-Daily	8.478	12.82	9.002	81.18	10.940	768.9	9.401	227.7	9.380	220.5	8.472	21.55
III Ten-Daily	8.528	15.94	8.617	25.34	13.100	2841	9.874	417.7	8.723	57.62	8.448	20.11
Monthly												
Min.	8.420	9.370	8.470	13.15	8.775	33.52	8.800	61.85	8.420	15.01	8.390	12.79
Max.	8.650	27.44	10.240	374.2	21.390	13879	13.450	1643	10.685	938.6	8.760	61.06
Mean	8.484	13.46	8.807	56.51	11.257	1309	10.057	472.5	9.402	290.6	8.475	23.47

Annual Runoff in MCM = 5977 Annual Runoff in mm = 184

Peak Observed Discharge = 13879 cumecs on 22/08/2016 Corres. Water Level :21.39 m

Lowest Observed Discharge = 7.483 cumecs on 31/05/2017 Corres. Water Level :8.36 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 Data for the period 2016 - 2017

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	8.510	22.68	8.420	15.01 *	8.420	14.54	8.430	16.24	8.400	12.70	8.370	10.54 *
2	8.510	22.97	8.420	15.52	8.420	14.49	8.430	16.35	8.400	13.51 *	8.370	10.71
3	8.480	20.08 *	8.420	16.06	8.420	14.52	8.410	14.20	8.410	12.69 *	8.370	10.44
4	8.480	20.08 *	8.420	16.09	8.420	14.62	8.410	14.03	8.410	12.56	8.370	9.603
5	8.480	21.16	8.420	16.03	8.440	16.61 *	8.410	14.25 *	8.410	12.52 *	8.370	11.33
6	8.460	20.26	8.420	14.65	8.450	17.44 *	8.410	14.73 *	8.400	11.43	8.370	11.03
7	8.440	19.33	8.420	14.35	8.470	19.18 *	8.430	14.30	8.390	11.01	8.370	9.932
8	8.450	17.84	8.420	15.01 *	8.510	22.92 *	8.420	14.51	8.370	10.80	8.370	9.759
9	8.440	17.61	8.470	17.40	8.450	17.44 *	8.420	14.36	8.360	10.76 *	8.370	9.558
10	8.440	17.31	8.470	19.16	8.420	15.01 *	8.420	15.42	8.350	10.41	8.370	11.41 *
11	8.440	16.61 *	8.420	14.63	8.420	15.01 *	8.420	14.86	8.360	10.26	8.370	10.66
12	8.430	15.80 *	8.420	14.69	8.420	15.01 *	8.420	15.01 *	8.370	9.603	8.370	10.66
13	8.430	17.03	8.420	14.73	8.420	15.01 *	8.420	15.01 *	8.370	10.08	8.370	10.60
14	8.430	16.88	8.420	14.54	8.420	15.01 *	8.420	14.86	8.370	11.41 *	8.370	11.41 *
15	8.430	16.88	8.420	15.01 *	8.420	15.01 *	8.410	14.25 *	8.370	10.95	8.370	9.475 *
16	8.430	16.92	8.420	14.46 *	8.420	15.01 *	8.410	14.91	8.370	11.41 *	8.370	10.63
17	8.440	18.15	8.420	15.01 *	8.420	15.01 *	8.410	14.68	8.370	10.72	8.370	9.692
18	8.440	16.61 *	8.410	14.25 *	8.440	16.61 *	8.420	15.23	8.370	10.67	8.370	9.871
19	8.440	17.05	8.410	14.25 *	8.470	19.18 *	8.420	15.01 *	8.370	10.38	8.370	10.41
20	8.440	18.14	8.400	13.51 *	8.460	18.30 *	8.420	14.74 *	8.370	10.22	8.370	9.982
21	8.410	15.32	8.400	13.51 *	8.460	18.30 *	8.420	15.04	8.370	10.19	8.370	11.41 *
22	8.410	15.24	8.400	13.51 *	8.460	18.30 *	8.420	14.51	8.370	10.44	8.370	9.676 *
23	8.410	16.08	8.400	13.51 *	8.460	18.30 *	8.410	12.89	8.370	11.41 *	8.370	9.782
24	8.440	17.40	8.410	14.25 *	8.460	18.30 *	8.430	13.39	8.370	10.72 *	8.370	9.909
25	8.460	18.30 *	8.420	15.01 *	8.440	16.61 *	8.430	13.67	8.370	10.46	8.370	9.395
26	8.440	16.61 *	8.420	15.01 *	8.430	15.80 *	8.430	15.80 *	8.370	10.48	8.370	9.395
27	8.420	15.01 *	8.420	15.01 *	8.430	16.81	8.420	13.60 *	8.370	10.74	8.370	8.733
28	8.420	15.01 *	8.420	15.01 *	8.430	16.75	8.420	13.61	8.370	10.66	8.370	11.41 *
29	8.420	16.26	8.420	15.01 *			8.410	13.18	8.370	10.41	8.370	9.617 *
30	8.420	16.03	8.420	15.01 *			8.410	13.01	8.370	11.41 *	8.370	9.553
31	8.420	15.96	8.420	15.01 *			8.400	12.58			8.360	7.483
Ten-Daily Mean												
I Ten-Daily	8.469	19.93	8.430	15.93	8.442	16.68	8.419	14.84	8.390	11.84	8.370	10.43
II Ten-Daily	8.435	17.01	8.416	14.51	8.431	15.92	8.417	14.86	8.369	10.57	8.370	10.34
III Ten-Daily	8.425	16.11	8.414	14.53	8.446	17.40	8.418	13.75	8.370	10.69	8.369	9.669
Monthly												
Min.	8.410	15.01	8.400	13.51	8.420	14.49	8.400	12.58	8.350	9.603	8.360	7.483
Max.	8.510	22.97	8.470	19.16	8.510	22.92	8.430	16.35	8.410	13.51	8.370	11.41
Mean	8.442	17.63	8.420	14.97	8.439	16.61	8.418	14.46	8.376	11.03	8.370	10.13

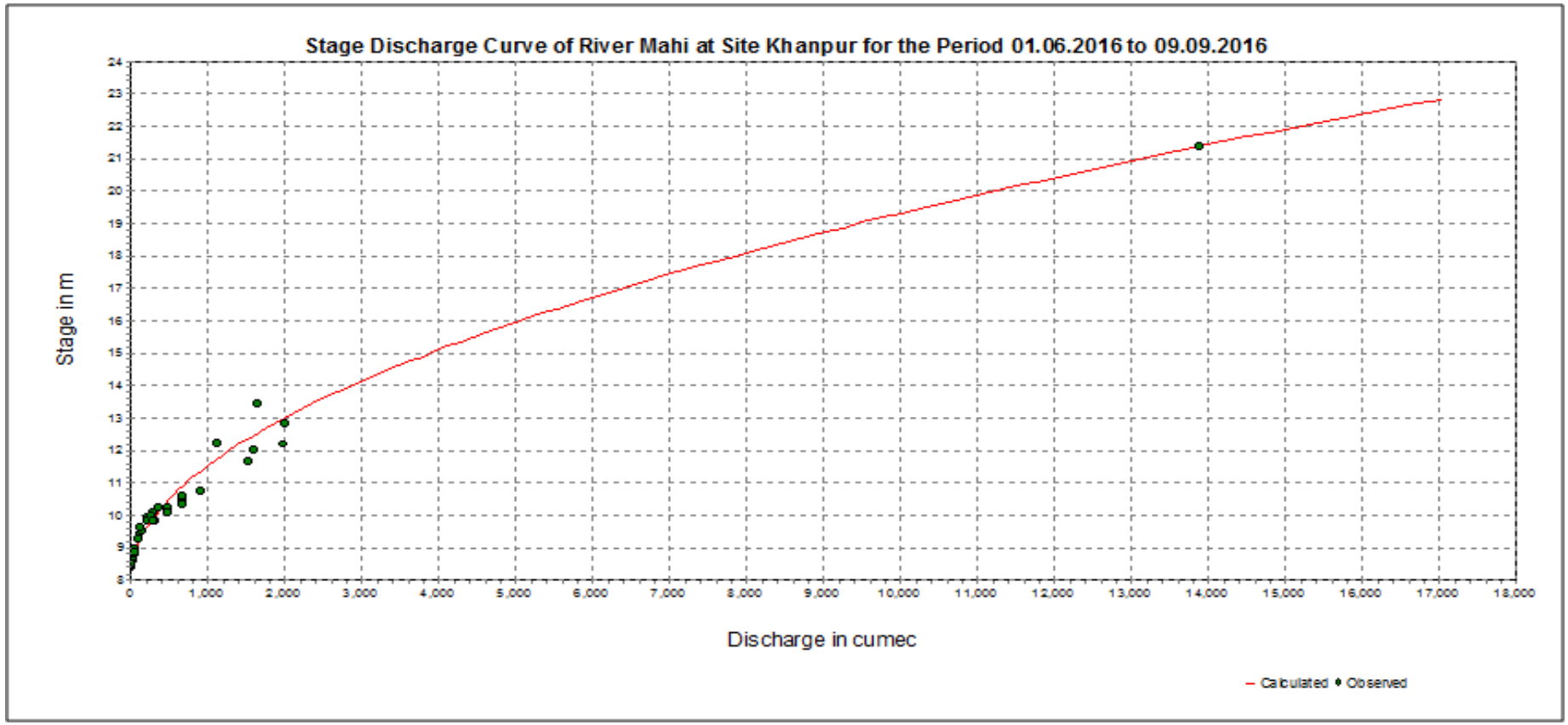
Peak Computed Discharge = 2314 cumecs on 25/08/2016 **Corres. Water Level :13.39 m**

Lowest Computed Discharge = 9.370 cumecs on 12/06/2016 **Corres. Water Level :8.42 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)

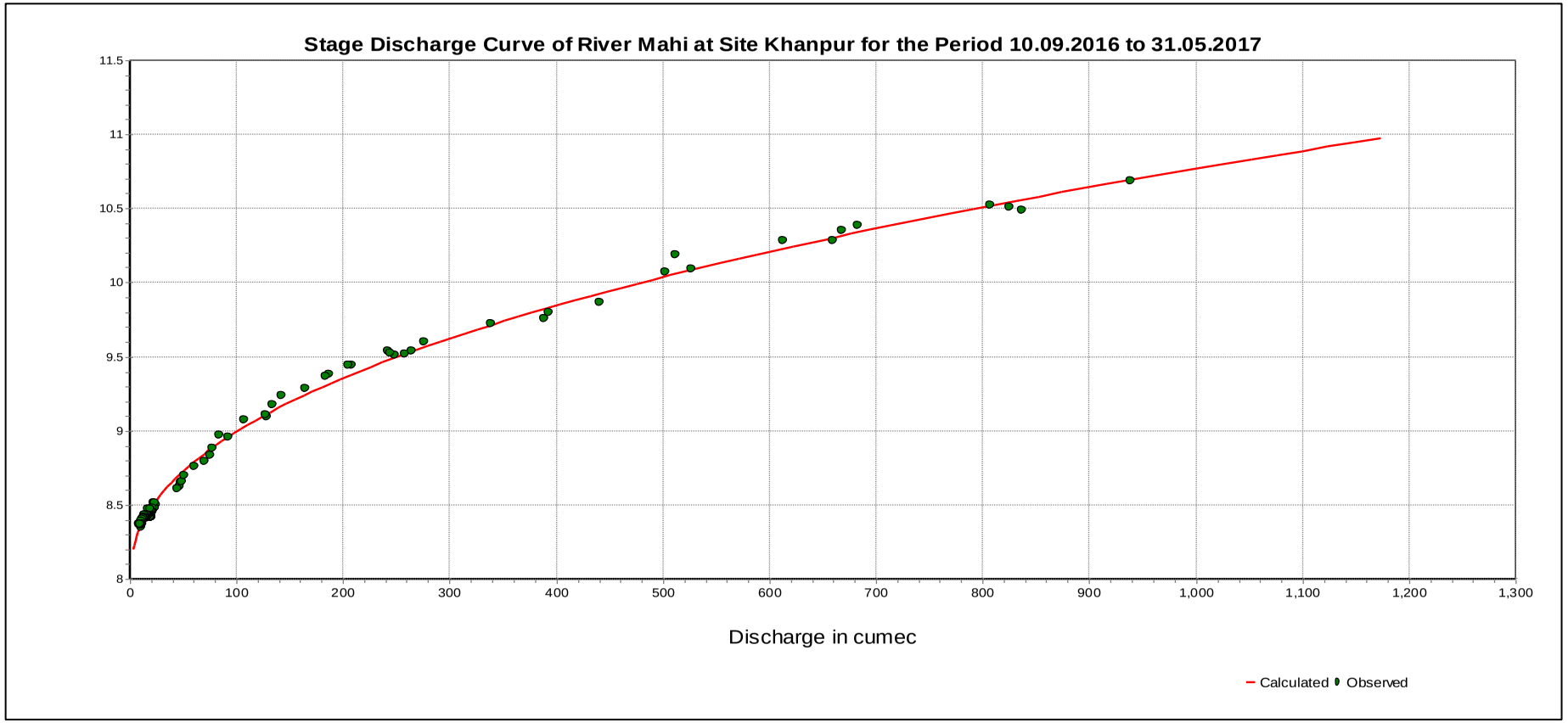
Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
8.3	23	-8.11	1.945	90.955



Procedure - Standard

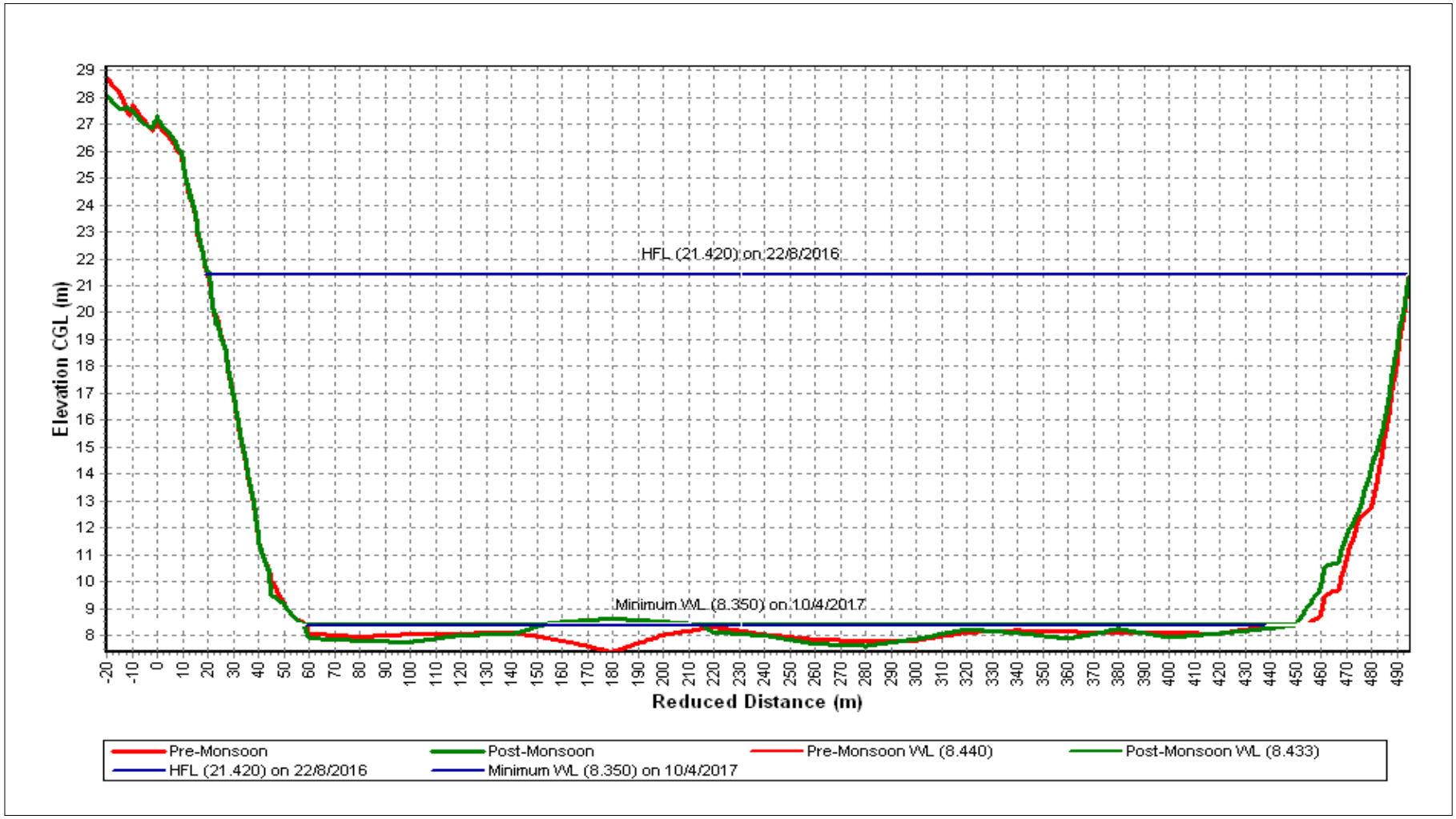
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
8.2	11	-7.98	2.274	97.118

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

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**



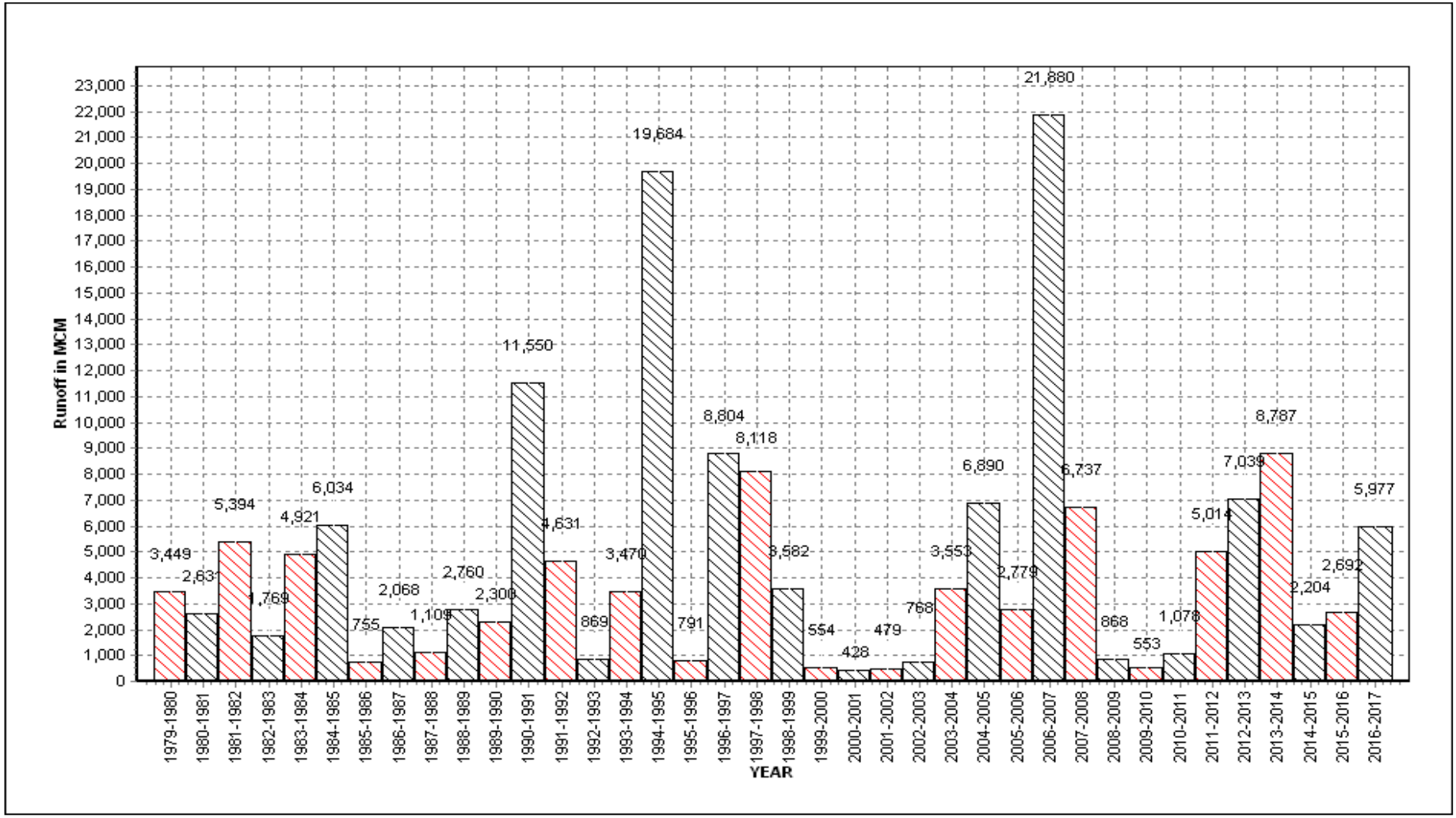
Historic Flood Level - 28.270 m on 24.08.1990 at 1600 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1979 - 2017

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

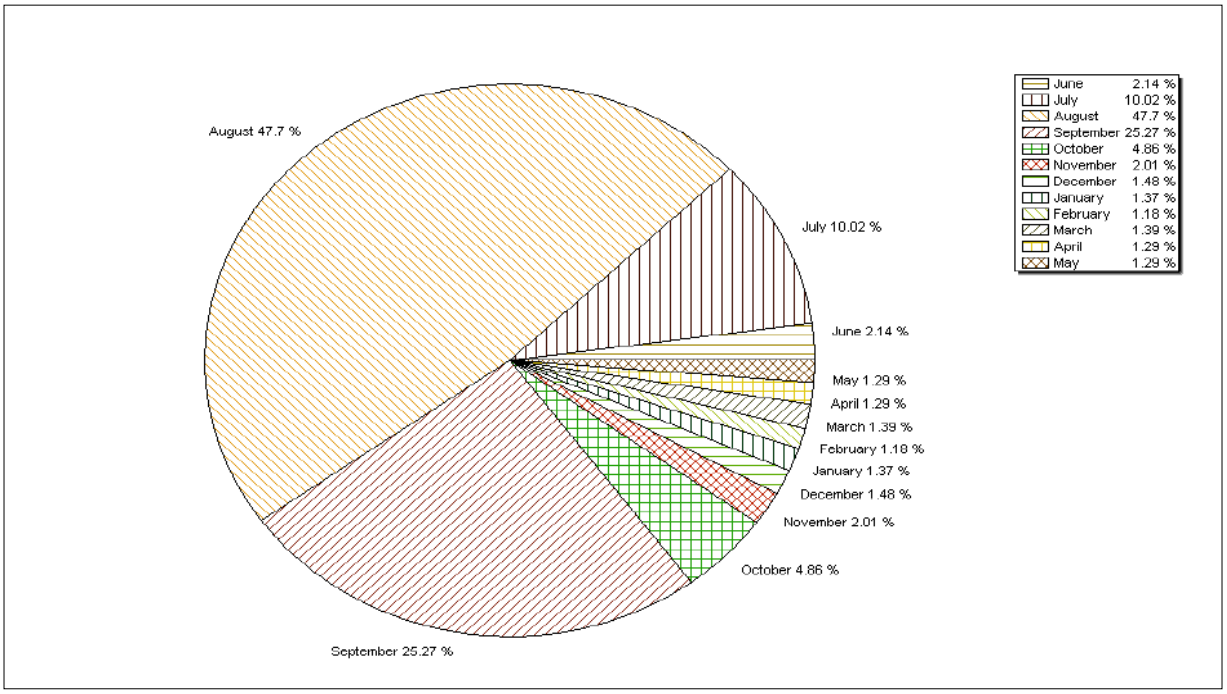


Note: Missing values have not been considered while arriving at Annual Runoff

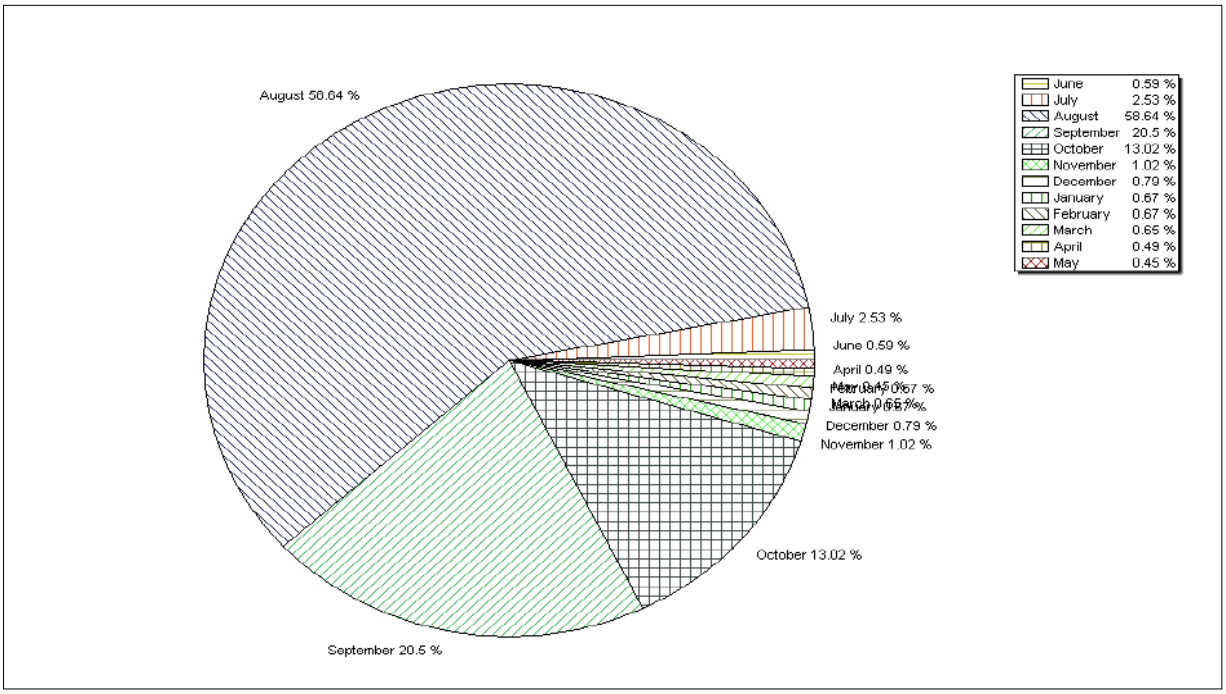
Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1979-2016



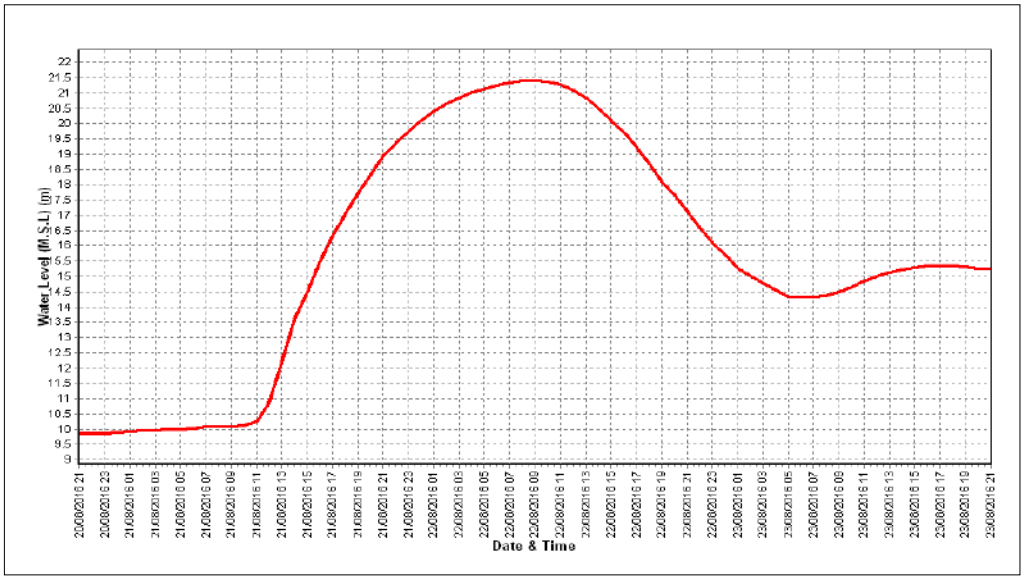
Monthly Runoff for the Year : 2016-2017



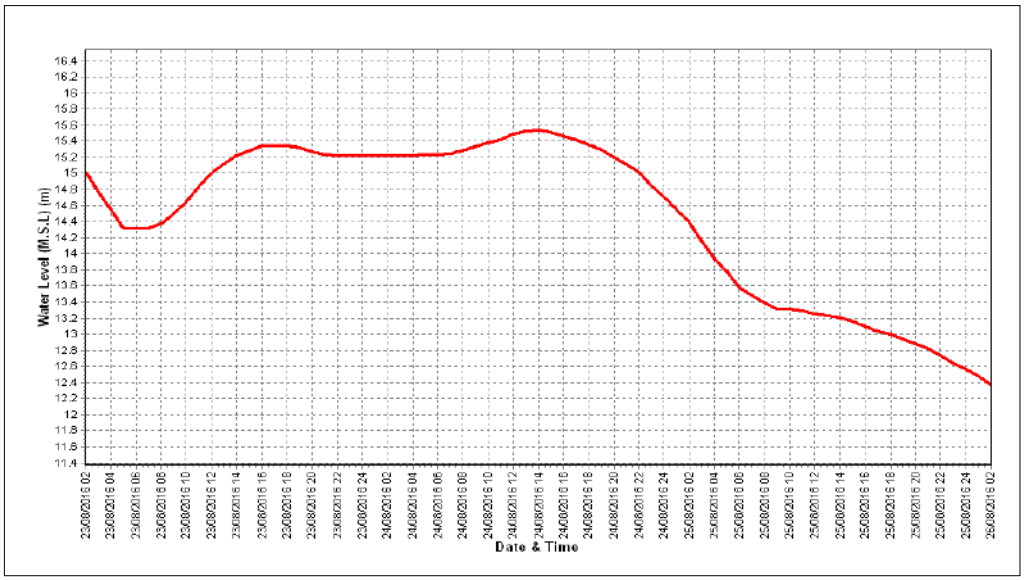
Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

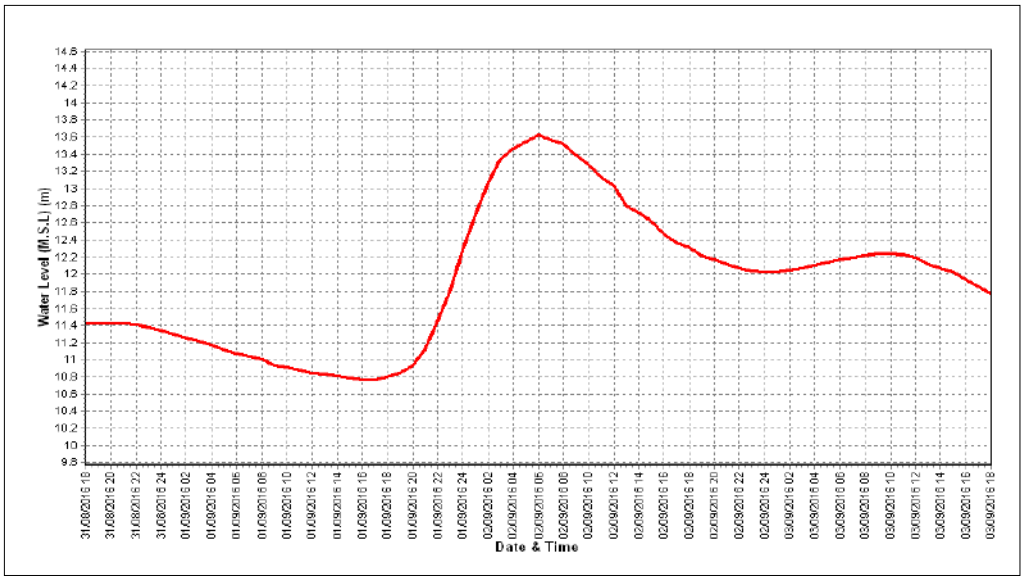
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-17

Site	**: Anas at Chakaliya**	**Code**	**: 01 02 13 007**
State	: Gujarat	District	Panchmahal
Basin	: Mahi	Independent R	: Mahi
Tributary	: Anas	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Anas
Division	: Mahi Division, Gandhinagar	Sub-Division	: Mahi Sub Divn., Kadana
Drainage Area	: 3121 Sq. Km.	Bank	: Left
Latitude	: 23°02'58" N	Longitude	: 74°19'14" E
Zero of Gauge (m)	: 180 (m.s.l)	01/03/1991	- 30/04/2003
	215 (m.s.l)	01/05/2003	-
	Opening Date	Closing Date	
Gauge	: 13/02/1991		
Discharge	: 13/02/1991		
Sediment	: -		
Water Quality	: -		

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1991-1992	2583	188.125	31/07/1991	0.000	181.360	29/04/1992
1992-1993	674.3	183.925	07/09/1992	0.000	180.890	15/06/1992
1993-1994	3717	192.100	17/07/1993	0.000	181.350	04/04/1994
1994-1995	4128	190.000	07/09/1994	0.000	181.440	17/04/1995
1995-1996	1387	184.350	25/07/1995	0.000	180.760	09/05/1996
1996-1997	3933	188.525	28/07/1996	0.000	181.400	22/04/1997
1997-1998	3419	187.400	01/08/1997	0.000	181.490	12/05/1998
1998-1999	1505	182.320	26/09/1998	0.000	181.160	11/06/1998
1999-2000	223.0	182.950	20/06/1999	0.000	181.350	13/01/2000
2000-2001	60.00	182.200	13/08/2000	0.000	181.370	14/11/2000
2001-2002	1525	185.050	18/06/2001	0.000	River Dry	23/01/2002
2002-2003	4226	189.800	03/09/2002	0.000	River Dry	25/03/2003
2003-2004	3228	223.950	24/08/2003	0.000	217.410	22/02/2004
2004-2005	5874	224.250	14/08/2004	0.000	217.250	01/03/2005
2005-2006	6956	224.350	28/07/2005	0.000	216.920	01/06/2005
2006-2007	5474	226.900	11/08/2006	0.000	River Dry	01/06/2006
2007-2008	3227	224.650	08/08/2007	0.000	217.360	01/06/2007
2008-2009	691.0	219.700	12/08/2008	0.000	217.020	12/05/2009
2009-2010	736.2	220.675	23/07/2009	0.000	218.200	04/11/2009
2010-2011	630.5	220.550	31/08/2010	0.000	218.060	20/05/2011
2011-2012	258.5	219.700	02/09/2011	0.000	River Dry	21/06/2011
2012-2013	2858.0	226.200	06/09/2012	0.000	218.150	01/06/2012
2013-2014	1025	222.1	02/08/2013	0.000	218.22	01/06/2013
2014-2015	486.2	222.275	09/09/2014	0.000	218.14	01/06/2014
2015-2016	1032	222.76	28/07/2015	0.000	218.33	17/06/2015
2016-2017	704	220.67	22/08/2016	0.000	218.33	01/06/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : Anas at Chakaliya (01 02 13 007) **Division : Mahi Division, Gandhinagar**

Local River : Anas **Sub-Division : Mahi Sub Divn., Kadana**

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	218.330	0.000	218.360	0.000	218.730	21.03 #	219.500	162.2	219.100	78.13	218.460	8.202
2	218.330	0.000	218.420	0.000	218.700	18.33 #	219.500	166.8	220.250	463.3 *	218.450	7.173
3	218.330	0.000	218.400	0.000	220.300	489.1 #	219.440	113.3	219.550	190.1	218.450	7.153
4	218.330	0.000	218.400	0.000	220.600	660.1 #	219.400	138.2 *	219.750	270.8	218.440	5.947
5	218.330	0.000	218.420	0.000	219.900	257.2	219.340	87.98	219.450	122.5	218.440	5.695
6	218.330	0.000	218.520	0.000	219.470	157.2 #	219.300	69.73	219.230	68.11	218.440	3.080 *
7	218.330	0.000	218.530	6.808	220.360	521.1 *	219.160	49.99	219.130	61.94	218.440	5.421
8	218.330	0.000	218.500	6.033	219.750	280.5	219.070	68.22	219.050	52.64	218.440	5.302
9	218.330	0.000	218.480	5.408	219.730	238.8	218.960	62.46	219.150	81.15 *	218.440	5.240
10	218.330	0.000	218.460	3.760 *	219.660	206.1	218.880	57.79	219.020	47.85	218.440	4.674
11	218.330	0.000	218.450	4.496	219.862	255.1	218.800	28.11 *	218.980	51.62 *	218.440	4.545
12	218.330	0.000	218.560	8.127	219.700	217.5	218.710	19.21 *	218.930	44.30 *	218.440	4.236
13	218.330	0.000	219.000	47.01	219.450	136.9	218.640	13.55 #	218.870	49.37	218.440	3.080 *
14	218.330	0.000	219.100	47.08	219.330	120.6 *	218.600	10.79 #	218.820	44.51	218.440	3.080 *
15	218.330	0.000	219.000	36.29	219.180	87.13 *	218.560	8.380 #	218.770	37.84	218.440	4.120
16	218.330	0.000	218.920	26.56	219.000	68.84	218.580	9.540 #	218.720	20.11 *	218.430	3.192
17	218.330	0.000	218.800	28.11 *	218.890	63.82	218.700	18.33 #	218.680	34.58	218.430	3.030
18	218.330	0.000	218.640	8.688	218.840	54.02	220.000	345.8 *	218.650	31.66	218.430	2.861
19	218.330	0.000	218.600	7.009	218.800	46.99	220.100	390.5 #	218.630	26.07	218.430	2.778
20	218.330	0.000	218.570	5.992	218.760	34.00	219.620	217.2	218.620	22.84	218.430	2.760 *
21	218.330	0.000	218.550	5.054	220.000	345.8 *	219.750	273.2	218.600	20.74	218.430	2.445
22	218.330	0.000	218.540	4.614	220.670	704.0 #	219.900	305.2	218.590	23.46	218.430	2.395
23	218.330	0.000	218.520	4.109	220.000	345.8 #	219.670	148.8 #	218.560	8.380 *	218.430	2.105
24	218.330	0.000	218.500	5.370 *	219.740	263.6	219.350	114.2	218.540	21.03	218.430	2.067
25	218.350	0.000	218.470	3.896	219.660	215.6 *	219.600	196.1 *	218.530	9.810	218.430	1.978
26	218.420	0.000	218.530	4.728	219.600	211.0	219.800	288.7	218.520	10.90	218.430	1.897
27	218.430	0.000	218.750	14.96	219.550	179.6	219.650	212.3 #	218.510	10.26	218.430	2.760 *
28	218.410	0.000	219.400	138.2 #	220.000	345.8 *	219.300	87.04	218.500	9.968	218.430	1.818
29	218.400	0.000	219.300	113.4 #	219.460	142.8	219.130	67.00	218.490	9.293	218.430	2.760 *
30	218.380	0.000	218.960	48.62 #	219.410	128.6	218.950	61.49	218.480	8.817	218.430	2.760 *
31			218.800	28.11 *	219.340	85.92			218.470	4.140 *		
Ten-Daily Mean												
I Ten-Daily	218.330	0.000	218.449	2.201	219.720	284.9	219.255	97.67	219.368	143.6	218.444	5.789
II Ten-Daily	218.330	0.000	218.764	21.94	219.181	108.5	219.031	106.1	218.767	36.29	218.435	3.368
III Ten-Daily	218.371	0.000	218.756	33.73	219.766	269.9	219.510	175.4	218.526	12.44	218.430	2.299
Monthly												
Min.	218.330	0.000	218.360	0.000	218.700	18.33	218.560	8.380	218.470	4.140	218.430	1.818
Max.	218.430	0.000	219.400	138.2	220.670	704.0	220.100	390.5	220.250	463.3	218.460	8.202
Mean	218.344	0	218.660	19.76	219.563	222.7	219.265	126.4	218.875	62.46	218.436	3.818

Annual Runoff in MCM = 1157 Annual Runoff in mm = 371

Peak Observed Discharge = 704.0 cumecs on 22/08/2016 Corres. Water Level :220.67 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :218.33 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 Data for the period 2016 - 2017

Station Name : Anas at Chakaliya (01 02 13 007) **Division : Mahi Division, Gandhinagar**

Local River : Anas **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	218.430	2.760 *	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000
2	218.420	2.470 *	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000
3	218.420	2.470 *	218.420	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
4	218.420	2.470 *	218.420	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
5	218.420	2.470 *	218.420	0.000 *	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
6	218.420	2.470 *	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
7	218.420	1.333	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
8	218.420	2.470 *	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
9	218.420	2.470 *	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
10	218.420	1.273	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
11	218.420	2.470 *	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
12	218.420	1.030	218.410	0.000	218.400	0.000	218.390	0.000	218.390	0.000	218.380	0.000
13	218.420	0.829	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
14	218.420	0.542	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
15	218.420	0.285	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
16	218.420	0.284	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
17	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
18	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.380	0.000
19	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.370	0.000
20	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.320	0.000 *
21	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.300	0.000
22	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.280	0.000
23	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.260	0.000
24	218.420	0.000	218.410	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.240	0.000
25	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.220	0.000
26	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.200	0.000
27	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.200	0.000
28	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.200	0.000
29	218.420	0.000	218.400	0.000			218.390	0.000	218.380	0.000	218.200	0.000
30	218.420	0.000	218.400	0.000			218.390	0.000	218.380	0.000	218.200	0.000
31	218.420	0.000	218.400	0.000			218.390	0.000			218.200	0.000
Ten-Daily Mean												
I Ten-Daily	218.421	2.266	218.415	0.000	218.400	0.000	218.392	0.000	218.390	0.000	218.380	0.000
II Ten-Daily	218.420	0.544	218.410	0.000	218.400	0.000	218.390	0.000	218.382	0.000	218.373	0.000
III Ten-Daily	218.420	0.000	218.404	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.227	0.000
Monthly												
Min.	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000	218.200	0.000
Max.	218.430	2.760	218.420	0.000	218.400	0.000	218.400	0.000	218.390	0.000	218.380	0.000
Mean	218.420	0.906	218.409	0	218.400	0	218.391	0	218.384	0	218.324	0

Peak Computed Discharge = 521.1 cumecs on 07/08/2016 Corres. Water Level :220.36 m

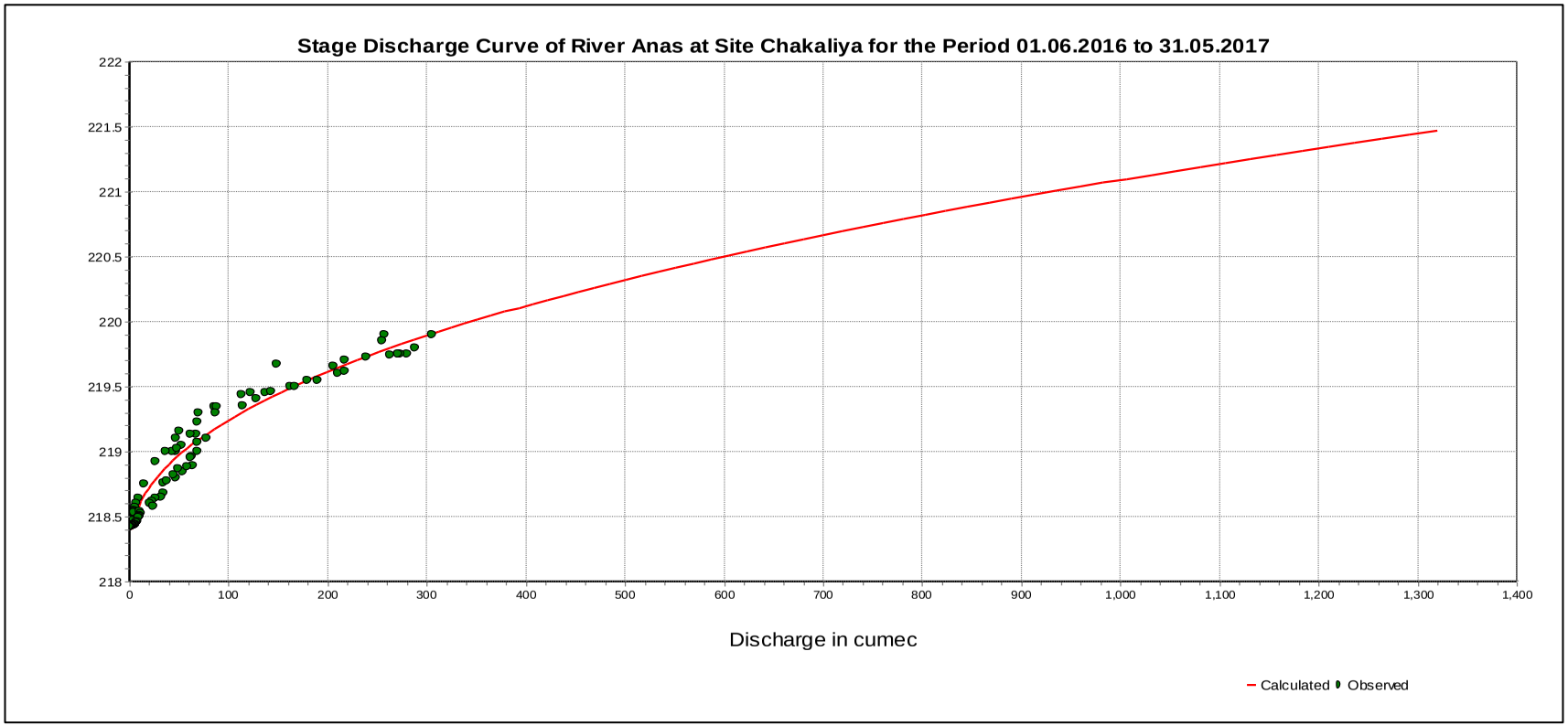
Lowest Computed Discharge = 0.000 cumecs on 05/01/2017 Corres. Water Level :218.42 m

Note: River was in pooling condition from 17/12/2016 to 31/05/2017.

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



Procedure - Standard

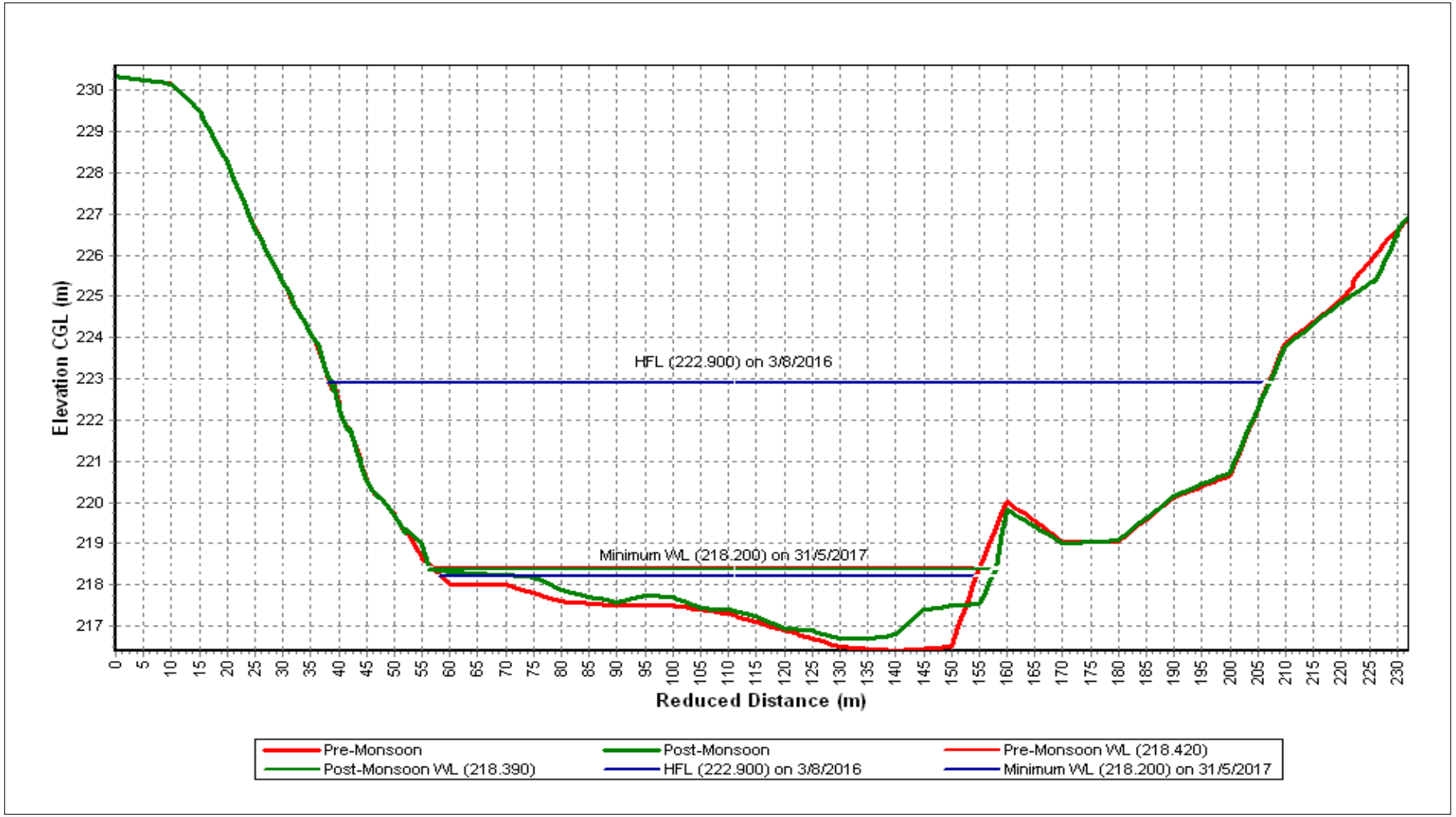
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
218.4	221.5	-218.23	2.215	97.616

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

Station Name : Anas at Chakaliya (01 02 13 007) **Division : Mahi Division, Gandhinagar**

Local River : Anas **Sub-Division : Mahi Sub Divn., Kadana**



Histroic Flood Level -230.200 m on 11.08.2006 at 1400 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

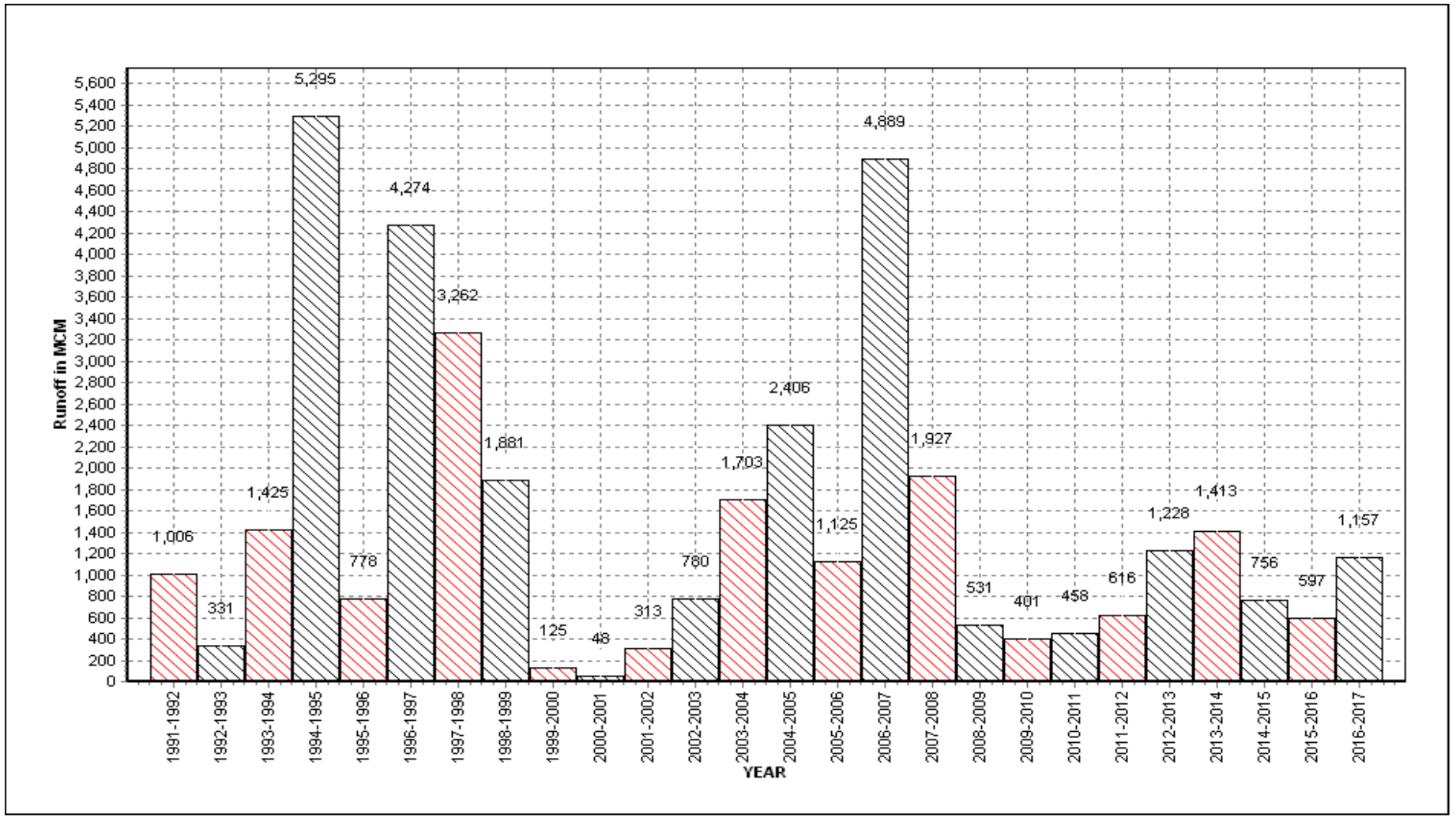
Annual Runoff Values for the period: 1991 - 2017

Station Name : Anas at Chakaliya (01 02 13 007)

Local River : Anas

Division : Mahi Division, Gandhinagar

Sub-Division : Mahi Sub Divn., Kadana

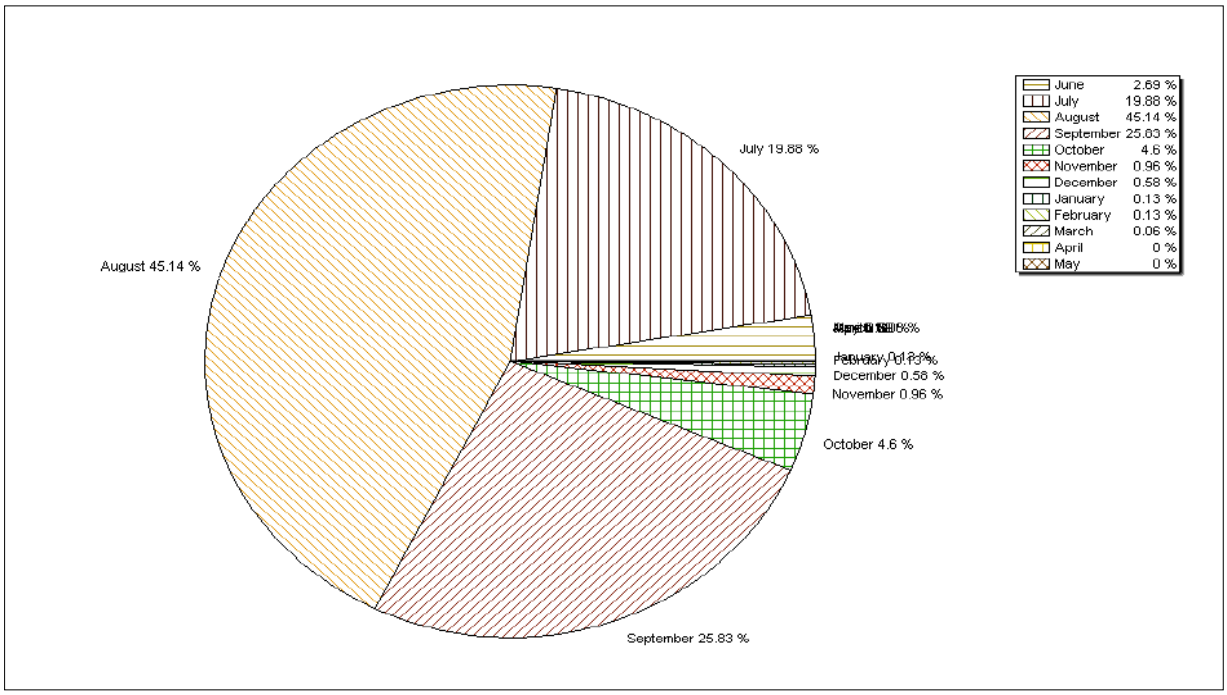


Note: Missing values have not been considered while arriving at Annual Runoff

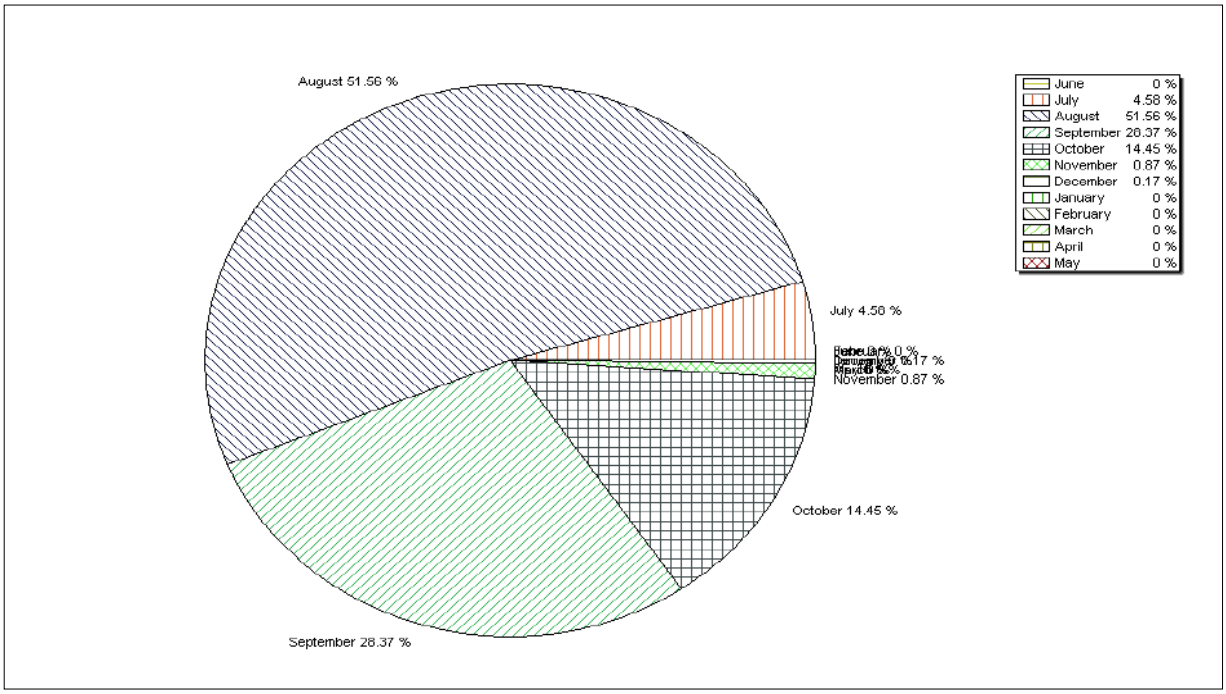
Station Name : Anas at Chakaliya (01 02 13 007) **Division : Mahi Division, Gandhinagar**

Local River : Anas **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1991-2016



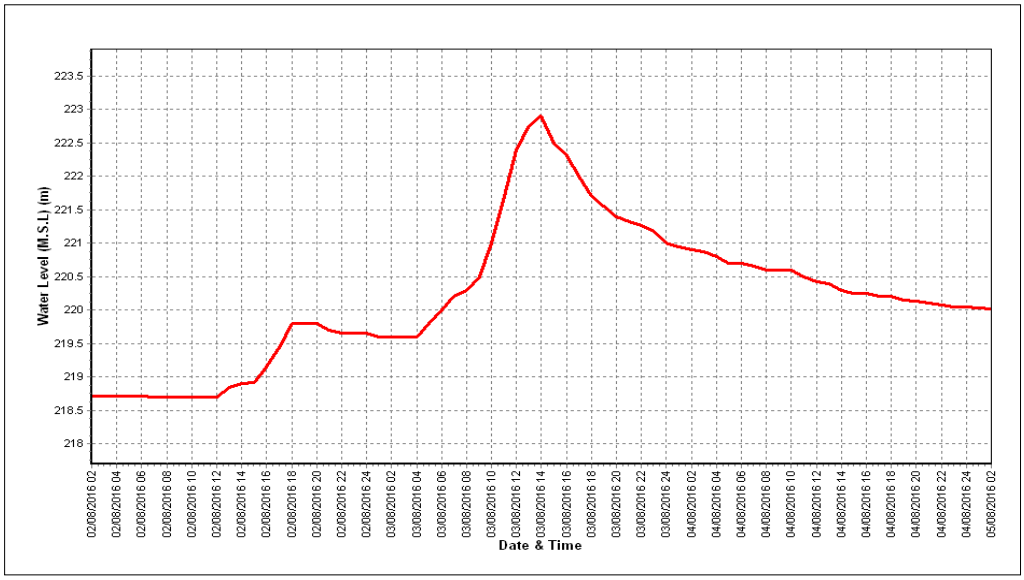
Monthly Runoff for the Year : 2016-2017



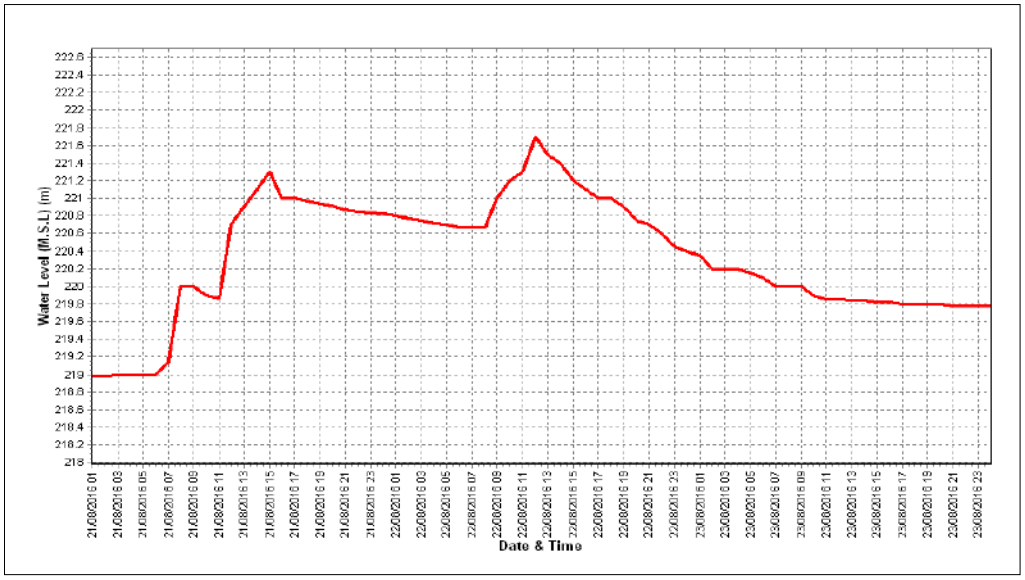
Station Name : Anas at Chakaliya (01 02 13 007) **Division : Mahi Division, Gandhinagar**

Local River : Anas **Sub-Division : Mahi Sub Divn., Kadana**

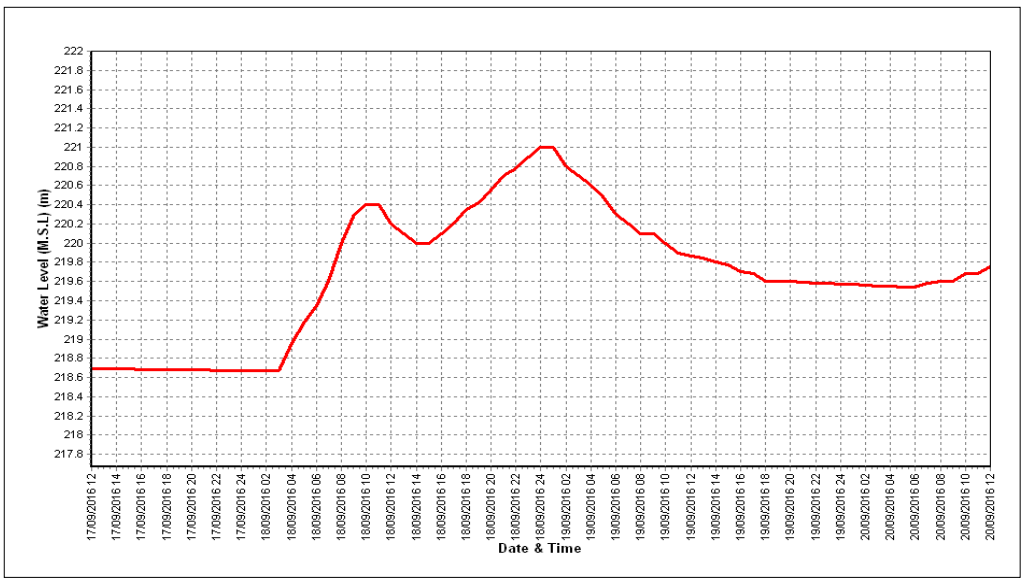
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Mahi at Paderdibadi**	**Code**	**:**	**01 02 13 006**
State	:	Rajasthan	District		Dungarpur
Basin	:	Mahi	Independent Ri	:	Mahi
Tributary	:	Mahi	Sub Tributary	:	
Sub Sub Tributary:			Local River	:	Mahi
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Mahi Sub Divn., Kadana
Drianage Area :		16247 Sq. Km.	Bank	:	Right
Latitude	:	23°46'02" N	Longitude	:	74°08'12" E
Zero of Gauge(m):		131 (m.s.l)	17/09/1977	-	
		Opening Date	Closing Date		
Gauge	:	17/09/1977			
Discharge	:	24/06/1978			
Sediment	:	21/07/1980			
Water Quality	:	01/07/1978			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1978-1979	4615	141.355	17/08/1978	0.000	River Dry	31/05/1979
1979-1980	6206	141.390	10/08/1979	0.000	River Dry	12/05/1980
1980-1981	3886	140.050	31/08/1980	0.000	River Dry	02/05/1981
1981-1982	5720	142.100	17/08/1981	0.000	River Dry	15/06/1981
1982-1983	1725	137.700	19/08/1982	0.000	132.775	17/06/1982
1983-1984	1090	137.130	16/08/1983	0.100	132.970	06/06/1983
1984-1985	9343	143.080	20/08/1984	0.000	River Dry	13/05/1985
1985-1986	523.5	135.785	25/09/1985	0.000	132.840	08/07/1985
1986-1987	6818	141.800	16/08/1986	0.000	132.945	31/05/1987
1987-1988	2154	139.110	26/08/1987	0.000	132.970	09/08/1987
1988-1989	1320	137.450	06/08/1988	0.000	132.945	27/05/1989
1989-1990	584.7	135.970	02/09/1989	0.000	132.925	07/06/1989
1990-1991	4760	141.600	24/08/1990	2.000	133.150	30/05/1991
1991-1992	3037	139.897	24/08/1991	0.125	133.105	30/06/1991
1992-1993	328.6	135.088	09/09/1992	0.000	133.015	20/06/1992
1993-1994	1580	137.125	17/07/1993	0.000	133.090	07/06/1993
1994-1995	6684	142.250	02/08/1994	0.000	133.115	07/06/1994
1995-1996	303.4	134.983	26/07/1995	0.000	133.110	30/06/1995
1996-1997	3143	139.310	08/08/1996	0.000	132.795	13/06/1996
1997-1998	2440	138.250	24/08/1997	0.000	133.015	16/06/1997
1998-1999	6699	141.700	17/09/1998	0.000	133.070	29/04/1999
1999-2000	531.5	135.250	19/07/1999	0.000	132.890	13/05/2000
2000-2001	158.0	134.410	13/07/2000	0.000	132.350	22/12/2000
2001-2002	204.0	134.625	12/07/2001	0.000	River Dry	02/06/2001

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
2002-2003	243.9	134.880	04/09/2002	0.000	132.580	18/01/2003
2003-2004	1777	137.140	26/09/2003	0.000	133.075	21/06/2003
2004-2005	2888	139.990	24/08/2004	0.000	133.115	02/07/2004
2005-2006	3637	141.525	28/07/2005	0.558	133.180	17/05/2006
2006-2007	16153	147.525	19/08/2006	0.000	132.550	01/06/2006
2007-2008	3802	140.080	09/08/2007	0.000	133.130	02/05/2008
2008-2009	262.7	135.150	12/08/2008	0.000	132.930	27/05/2009
2009-2010	438.9	135.850	05/09/2009	0.000	133.180	17/03/2010
2010-2011	204.9	134.180	09/09/2010	1.619	133.190	12/04/2011
2011-2012	2382.2	140.520	12/09/2011	0.000	133.000	16/05/2012
2012-2013	2034.0	140.200	07/09/2012	0.000	132.750	01/06/2012
2013-2014	1788	139.75	02/08/2013	0.000	133.11	01/06/2013
2014-2015	519.6	135.57	10/09/2014	0.000	133.15	01/06/2014
2015-2016	2250	139.1	28/07/2015	1.71	133	12/12/2015
2016-2017	3497	140.65	22/08/2016	0.000	133	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

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	133.000	0.000	133.020	0.000	134.130	182.4	135.430	438.2	133.970	78.30	133.490	19.09
2	133.000	0.000	133.020	0.000	134.340	208.0	136.700	726.7	133.940	143.7 *	133.440	17.14
3	132.990	0.000	133.020	0.000	134.815	304.0	135.400	422.1	135.280	397.4 *	133.440	17.64
4	132.990	0.000	133.040	0.000	135.300	430.9	135.100	354.0 *	134.600	249.1 *	133.440	17.07 *
5	132.980	0.000	134.215	182.5	134.720	274.0	135.160	378.6	134.670	262.4 *	133.430	15.98
6	132.970	0.000	133.730	117.3 *	134.400	220.2	134.930	336.7	135.490	452.0 *	133.430	16.58
7	132.960	0.000	133.570	99.39 #	135.400	428.1 *	134.850	324.6	134.860	300.8 *	133.420	16.90
8	132.960	0.000	133.460	16.68	134.600	264.9	134.740	283.8	135.050	342.4 *	133.410	16.43
9	132.950	0.000	133.380	80.44 #	134.750	278.2 #	134.620	265.5	134.680	264.4 *	133.410	16.28
10	132.940	0.000	133.340	76.77 *	137.300	1119 #	134.750	278.2 *	134.450	222.0 *	133.400	15.90
11	132.930	0.000	133.350	77.67 #	137.970	1464 #	134.620	252.9 *	134.220	184.1 *	133.390	15.35
12	132.920	0.000	133.350	77.67 #	135.990	545.8	134.310	207.7	133.980	149.1 *	133.390	14.59 *
13	132.910	0.000	135.370	431.6	135.485	459.2	134.290	195.1 *	133.950	152.2	133.380	14.08 *
14	132.900	0.000	134.220	184.5	135.290	399.9 *	134.500	236.5	133.940	146.8	133.370	13.57
15	132.900	0.000	133.870	146.4	134.600	249.1 *	134.470	234.8	133.920	145.4	133.360	14.03
16	132.880	0.000	133.700	107.8	134.600	266.8	134.270	200.4	133.900	138.4 *	133.360	13.05 *
17	132.880	0.000	133.610	103.7 *	134.345	216.2	134.070	167.9	133.880	138.5	133.360	13.05 *
18	132.860	0.000	133.530	20.06	134.275	200.4	134.190	179.4 *	133.870	136.4	133.350	12.53 *
19	132.850	0.000	133.490	17.89	134.450	232.2	134.350	205.0 *	133.860	134.6	133.340	12.01 *
20	132.840	0.000	133.450	17.56	134.420	229.5	134.390	211.7 *	133.850	132.7	133.330	11.48 *
21	132.840	0.000	133.410	16.65	146.400	11915 *	135.130	368.5	133.640	90.67	133.330	11.48 #
22	132.840	0.000	133.380	15.48	140.650	3497	134.540	242.5	133.610	85.70	133.320	10.95 *
23	132.830	0.000	133.350	14.30	139.310	2248	135.100	359.4	133.580	100.5 *	133.320	10.95 *
24	133.020	0.000	133.340	76.77 *	138.390	1722	134.620	266.7	133.560	80.22	133.320	10.95 *
25	133.020	0.000	133.950	157.2	136.900	939.2 *	134.450	222.0 *	133.540	78.34	133.350	12.53 *
26	133.020	0.000	134.030	156.0 *	136.270	625.1	134.230	194.7	133.540	36.23 *	133.350	12.53 *
27	133.010	0.000	133.740	118.5 *	136.060	571.0	134.110	175.4	133.540	77.53	133.380	14.08 *
28	133.010	0.000	135.710	514.0 *	135.400	428.1 *	134.250	188.8 *	133.530	76.11	133.410	16.62
29	133.010	0.000	134.800	288.3 *	136.540	689.4	134.080	163.1 *	133.520	94.16 *	133.410	15.95
30	133.010	0.000	134.240	187.2 *	135.340	427.1	134.010	153.2 *	133.510	93.14 *	133.400	15.58
31			134.110	167.4 *	135.615	467.6			133.500	92.12 *		
Ten-Daily Mean												
I Ten-Daily	132.974	0.000	133.379	57.30	134.976	370.9	135.168	380.8	134.699	271.2	133.431	16.90
II Ten-Daily	132.887	0.000	133.794	118.5	135.142	426.3	134.346	209.1	133.937	145.8	133.363	13.37
III Ten-Daily	132.961	0.000	134.005	155.6	137.898	2139	134.452	233.4	133.552	82.24	133.359	13.16
Monthly												
Min.	132.830	0.000	133.020	0.000	134.130	182.4	134.010	153.2	133.500	36.23	133.320	10.95
Max.	133.020	0.000	135.710	514.0	146.400	11915	136.700	726.7	135.490	452.0	133.490	19.09
Mean	132.941	0	133.735	111.9	136.066	1016	134.655	274.5	134.046	163.7	133.384	14.48

Annual Runoff in MCM = 4411 Annual Runoff in mm = 272

Peak Observed Discharge = 3497 cumecs on 22/08/2016 Corres. Water Level :140.65 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :133 m

Note: From 01/06/2016 to 04/06/2016 river was in pooling condition

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 Data for the period 2016 - 2017

Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	133.410	15.59 *	133.440	17.07 *	133.470	17.76	133.380	14.19	133.340	11.75	133.310	10.23
2	133.410	15.59 *	133.450	17.62	133.460	18.04 *	133.370	13.71	133.340	12.01 *	133.300	9.919
3	133.410	15.59 *	133.460	18.04 *	133.450	17.11	133.370	13.66	133.330	11.48	133.290	9.320 *
4	133.420	16.09 *	133.460	17.79	133.460	17.42	133.370	13.57 *	133.330	11.49	133.290	9.320 *
5	133.440	17.07	133.450	17.44	133.460	18.04 *	133.360	13.05 *	133.330	11.36	133.290	9.061
6	133.420	17.23	133.450	17.26	133.460	18.04 *	133.360	13.54	133.330	11.48 *	133.280	9.270
7	133.420	17.02	133.450	16.52	133.450	17.56 *	133.380	14.19	133.330	11.48 *	133.280	8.760 *
8	133.420	16.85	133.470	18.52 *	133.450	17.56 *	133.380	13.30	133.330	11.48 *	133.280	8.760 *
9	133.420	16.09 *	133.480	19.26	133.480	19.00 *	133.370	14.09	133.320	10.95 *	133.270	8.200 *
10	133.420	16.09 *	133.480	19.00 #	133.480	19.00 *	133.370	13.94	133.320	10.94	133.260	7.630 *
11	133.420	16.09 *	133.470	17.93	133.440	17.07 *	133.380	14.08 *	133.320	10.76	133.250	7.050 *
12	133.410	15.59	133.470	17.66	133.420	16.09 *	133.390	14.59 *	133.320	10.76	133.240	6.460 *
13	133.410	16.49	133.450	16.52	133.390	14.07	133.390	14.59 *	133.320	10.80	133.230	5.850 #
14	133.410	16.39	133.450	17.05	133.380	14.08 *	133.390	14.83	133.320	10.95 *	133.230	5.850 *
15	133.410	16.29	133.440	17.07 *	133.370	14.13	133.410	15.59 *	133.310	10.41 *	133.220	5.240 *
16	133.410	15.59 *	133.430	16.64	133.390	14.59 *	133.410	15.00	133.330	10.48 *	133.210	5.610 *
17	133.410	15.59 *	133.430	16.46	133.380	14.13	133.400	14.76	133.340	11.80	133.210	5.610 *
18	133.400	15.09 *	133.420	16.21	133.380	13.87 *	133.390	14.58	133.340	11.57	133.210	5.610 #
19	133.390	14.59 *	133.410	15.59 *	133.350	12.53 *	133.390	14.59 *	133.340	11.56	133.210	5.610 #
20	133.390	14.59 *	133.410	15.59 *	133.320	10.95 #	133.380	14.08 *	133.340	11.55	133.210	5.020
21	133.390	14.59 *	133.330	11.48 *	133.310	10.41 #	133.370	13.20	133.330	11.25	133.210	4.610 *
22	133.390	14.59 *	133.210	4.610 *	133.310	10.41 #	133.370	13.15	133.330	11.03	133.210	4.610 *
23	133.410	15.59 *	133.210	11.83	133.300	9.870 #	133.370	13.11	133.330	11.48 *	133.210	4.610 *
24	133.410	15.59 *	133.240	6.460 *	133.300	9.870 *	133.370	13.57 *	133.330	10.90	133.200	3.960 *
25	133.410	15.59 *	133.250	7.050 *	133.310	10.41 *	133.360	12.86	133.320	10.73	133.200	3.960 *
26	133.410	15.59	133.300	9.870 *	133.310	10.41 *	133.360	13.05 *	133.320	10.50	133.200	3.960 *
27	133.400	15.09 *	133.480	19.00 *	133.310	10.41 *	133.360	12.71	133.310	10.41 *	133.190	3.290 *
28	133.400	15.09 *	133.490	19.48 *	133.380	13.96	133.350	12.26	133.310	10.41 *	133.190	3.290 *
29	133.410	16.10	133.520	20.90 *			133.350	12.26	133.310	10.19	133.190	3.290 *
30	133.420	16.67	133.510	20.43 *			133.340	12.05	133.310	10.41 *	133.190	3.290 *
31	133.420	16.56	133.490	19.48 *			133.340	11.93			133.190	3.290 *
Ten-Daily Mean												
I Ten-Daily	133.419	16.32	133.459	17.85	133.462	17.95	133.371	13.72	133.330	11.44	133.285	9.047
II Ten-Daily	133.406	15.63	133.438	16.67	133.382	14.15	133.393	14.67	133.328	11.06	133.222	5.791
III Ten-Daily	133.406	15.55	133.366	13.69	133.316	10.72	133.358	12.74	133.320	10.73	133.198	3.833
Monthly												
Min.	133.390	14.59	133.210	4.610	133.300	9.870	133.340	11.93	133.310	10.19	133.190	3.290
Max.	133.440	17.23	133.520	20.90	133.480	19.00	133.410	15.59	133.340	12.01	133.310	10.23
Mean	133.410	15.82	133.419	15.99	133.392	14.53	133.374	13.68	133.326	11.08	133.234	6.147

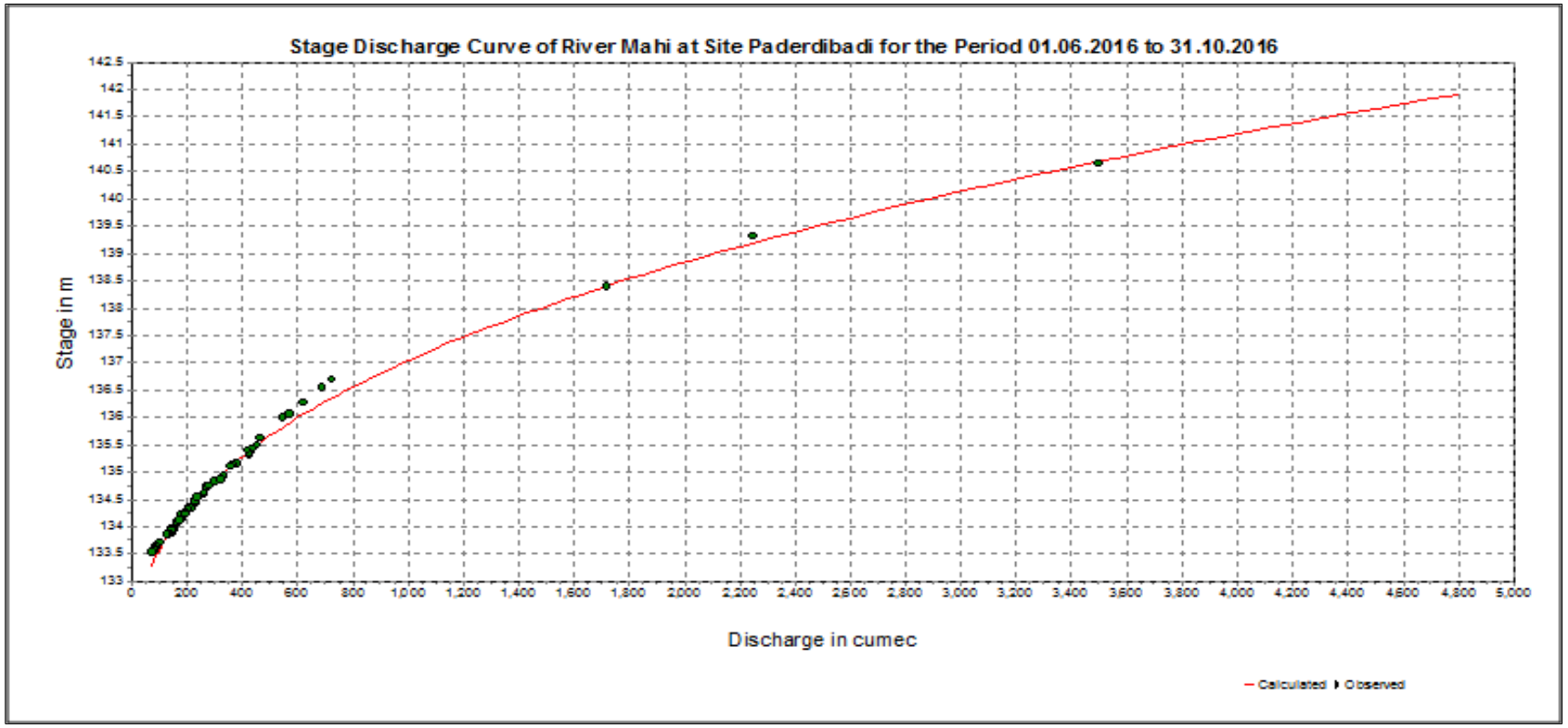
Peak Computed Discharge = 11915 cumecs on 21/08/2016 **Corres. Water Level :146.4 m**

Lowest Computed Discharge = 3.290 cumecs on 27/05/2017 **Corres. Water Level :133.19 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)

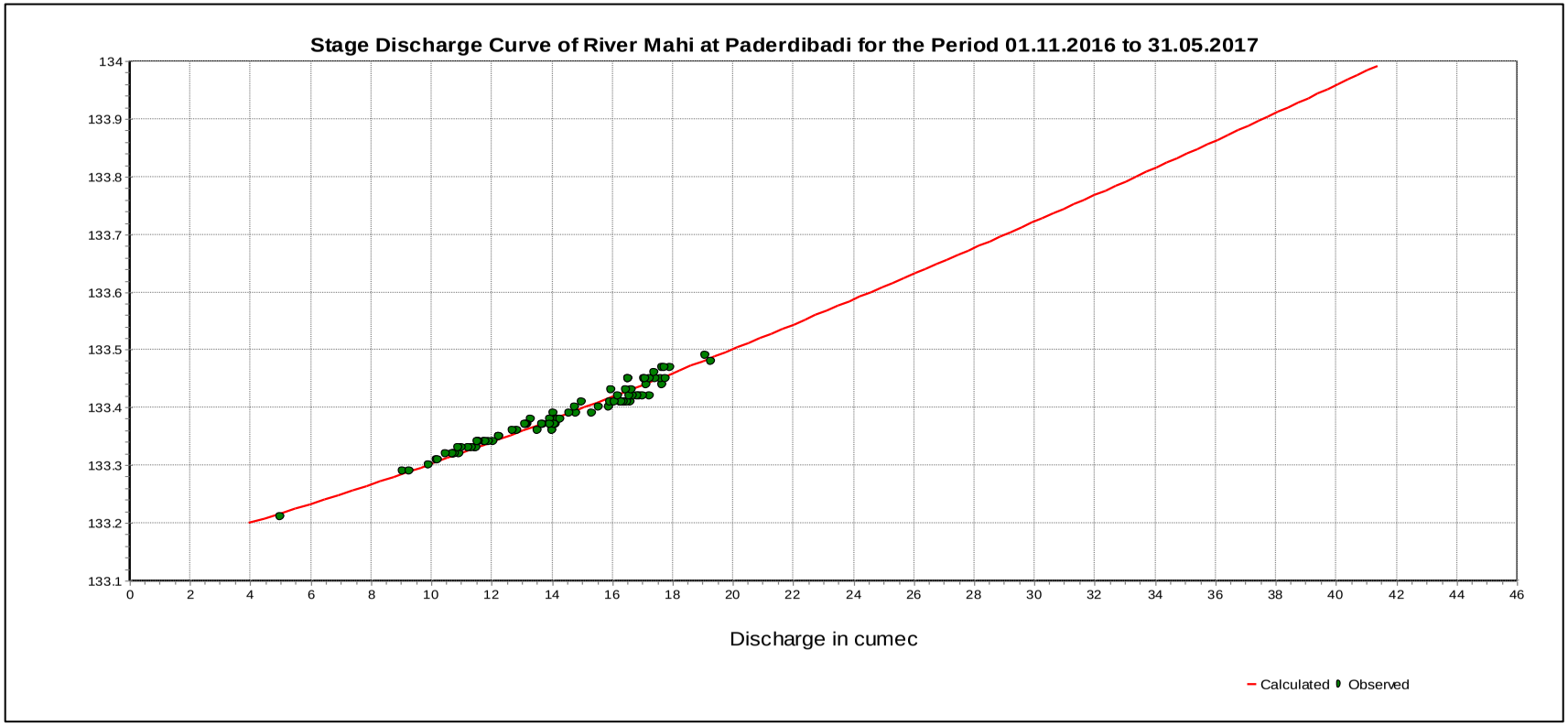
Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
133.3	142	-131.128	2.611	9.659



Procedure - Standard

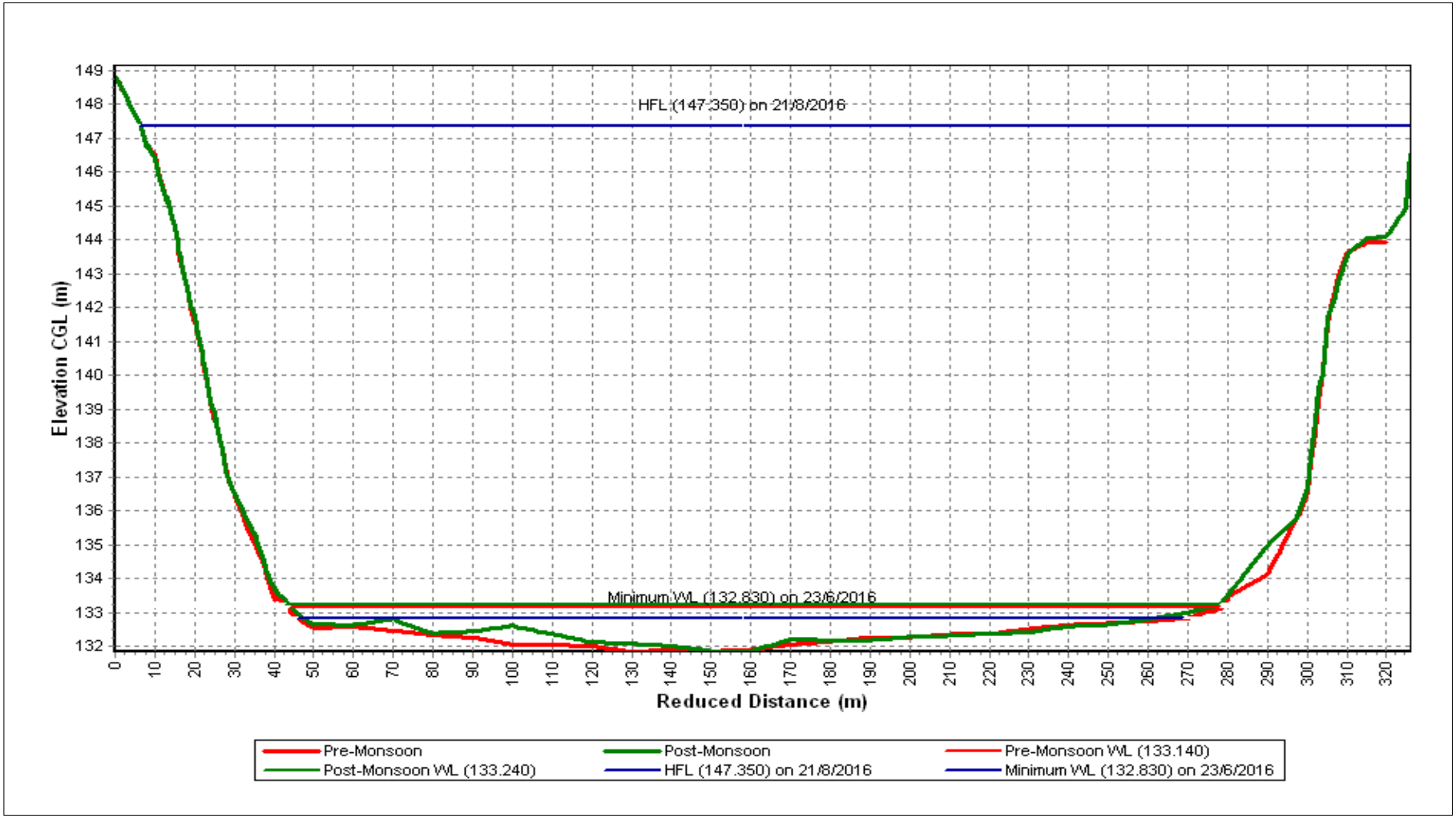
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
133.2	134	-133.15	0.831	47.749

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

Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**



Historic Flood Level- 149.650m on 19.08.2006 at 1600 hrs

Note: HFL marked on graph denotes Max Water Level observed during the Water Year 2016-17

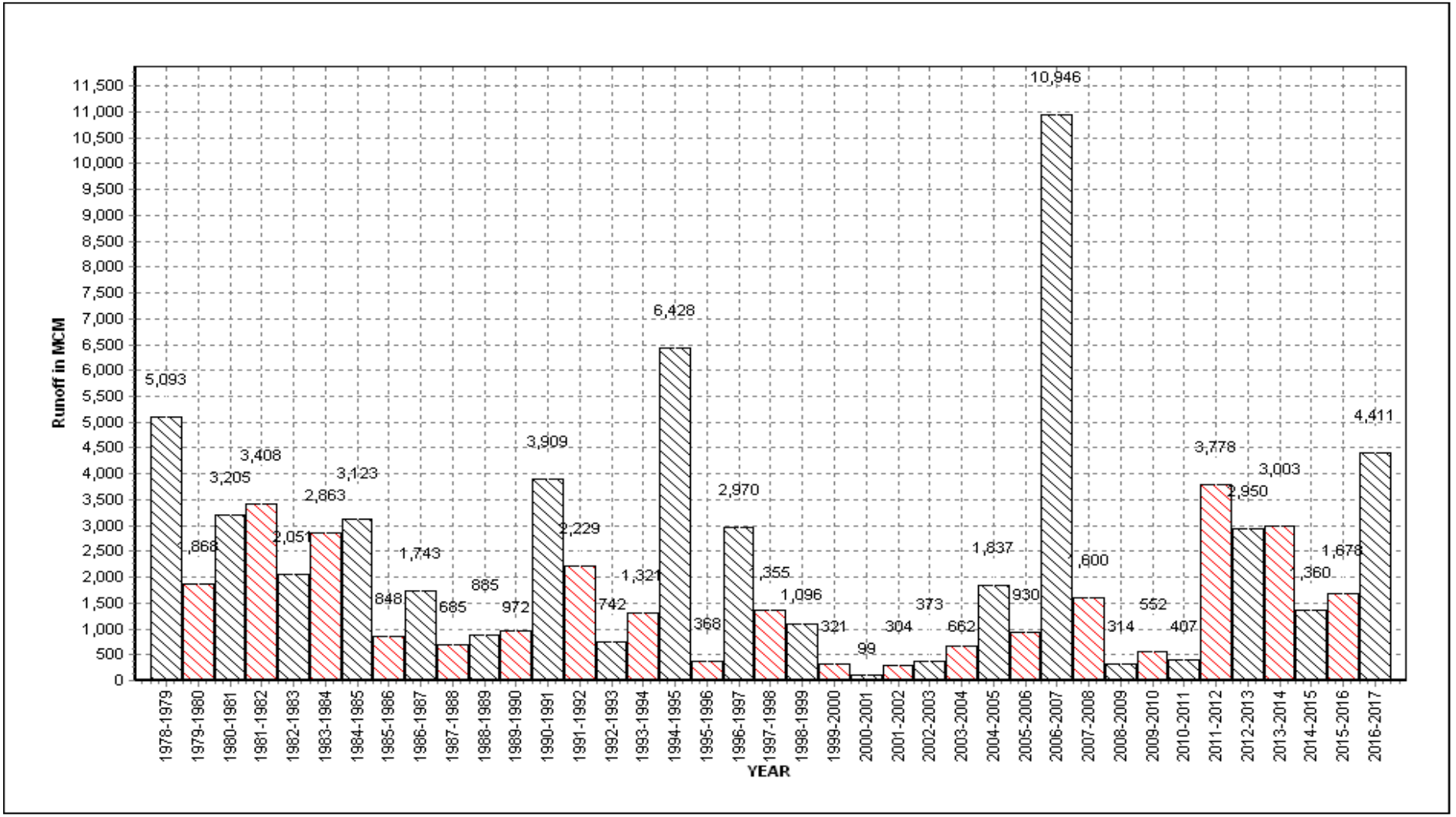
Annual Runoff Values for the period: 1978 - 2017

Station Name : Mahi at Paderdibadi (01 02 13 006)

Local River : Mahi

Division : Mahi Division, Gandhinagar

Sub-Division : Mahi Sub Divn., Kadana

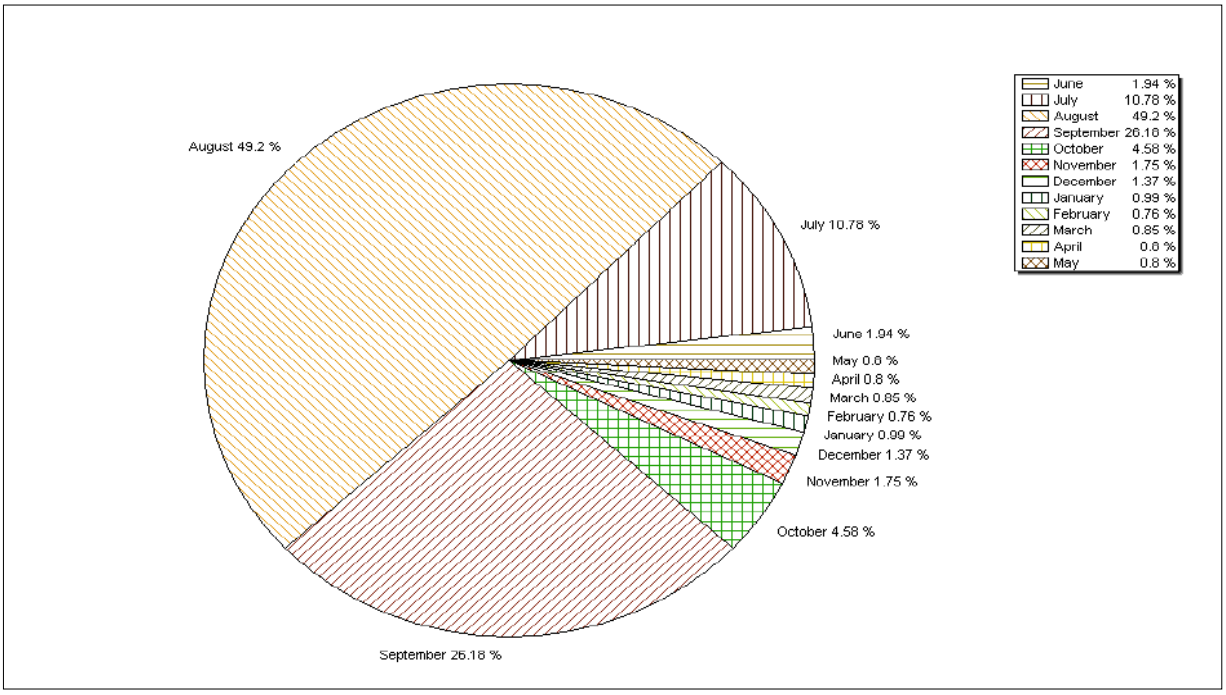


Note: Missing values have not been considered while arriving at Annual Runoff

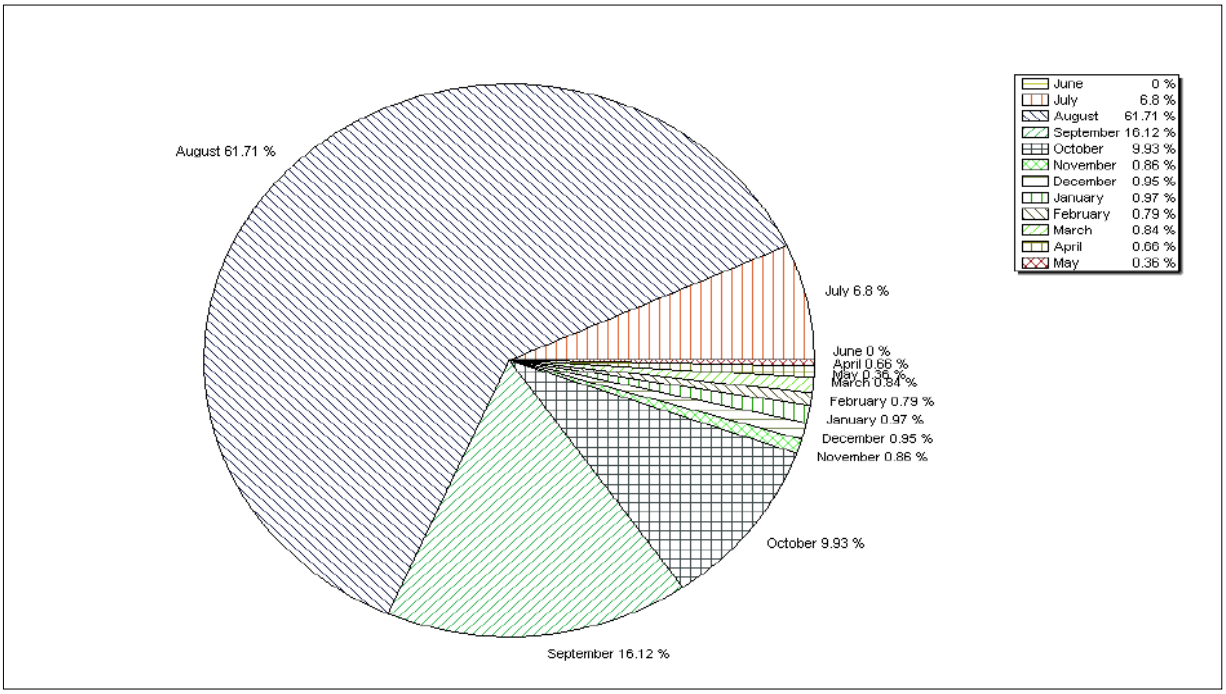
Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1978-2016



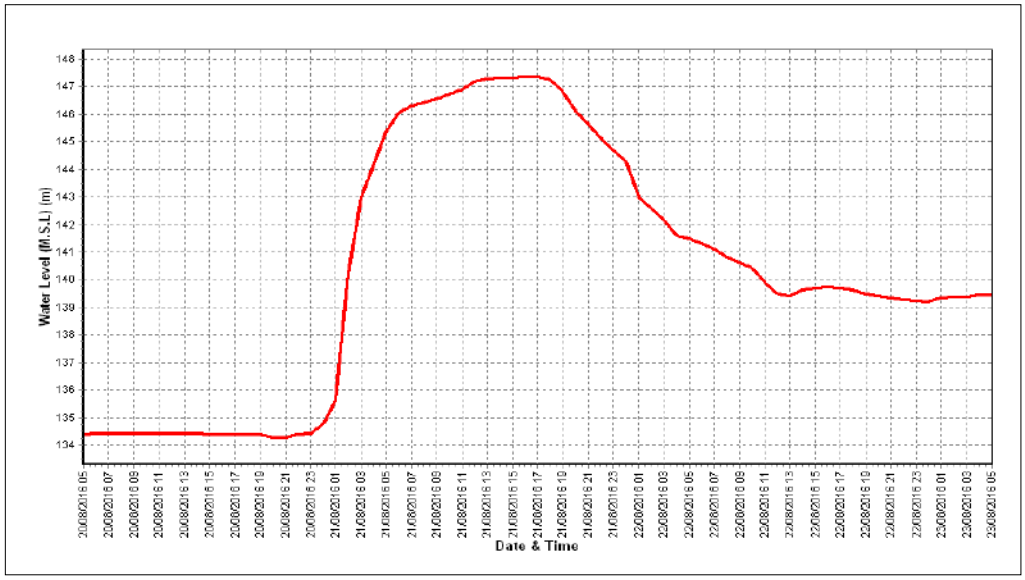
Monthly Runoff for the Year : 2016-2017



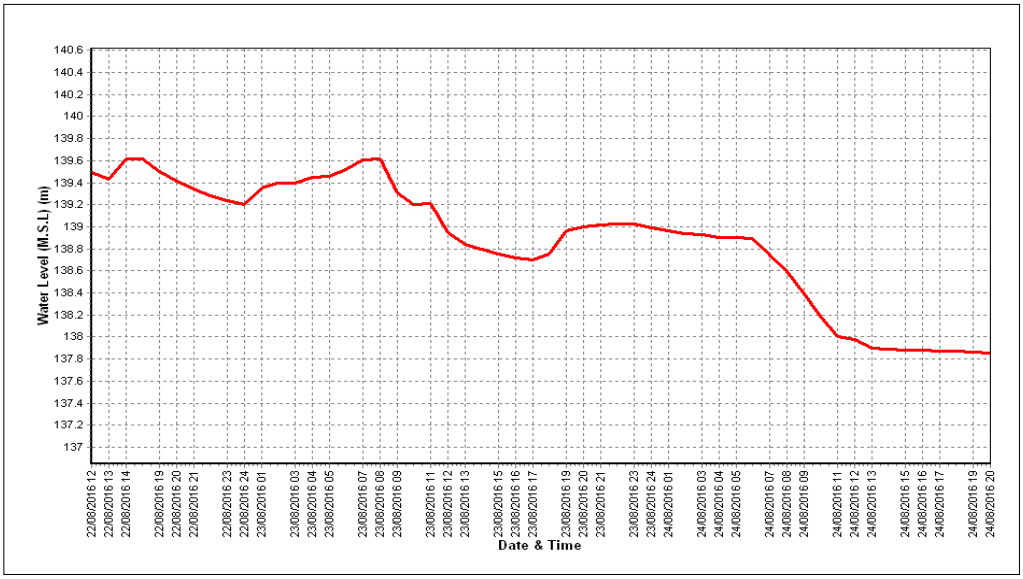
Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

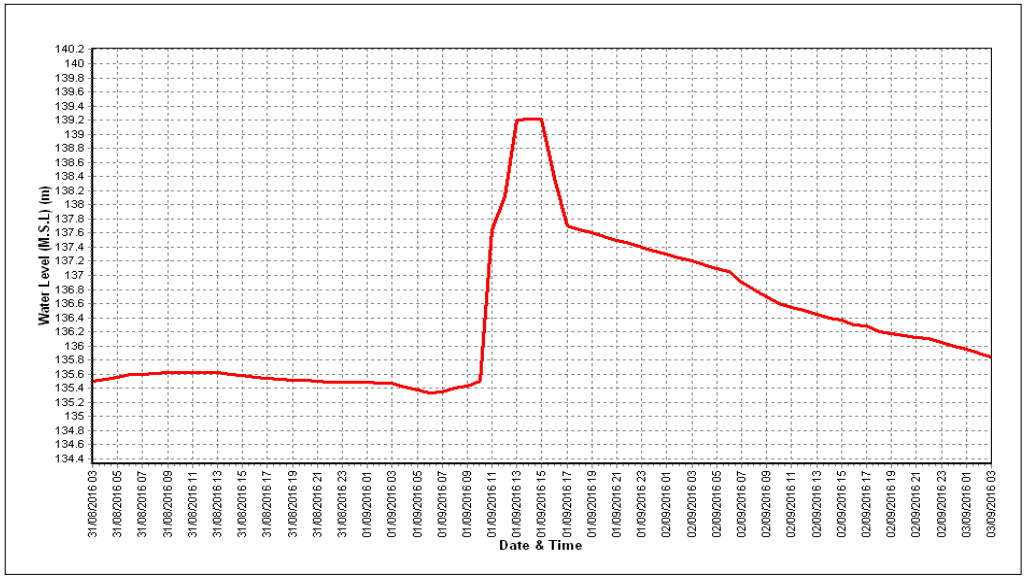
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Som at Rangeli**	**Code**	**:**	**01 02 13 005**
State	:	Rajasthan	District		Dungarpur
Basin	:	Mahi	Independent River	:	Mahi
Tributary	:	Som	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Som
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Mahi Sub Divn., Kadana
Drainage Area	:	8329 Sq. Km.	Bank	:	Right
Latitude	:	23°52'22" N	Longitude	:	74°13'25" E
Zero of Gauge (m)	:	150 (m.s.l)	01/01/1978	-	

		Opening Date	Closing Date
Gauge	:	15/07/1978	
Discharge	:	15/07/1978	
Sediment	:	-	
Water Quality	:	01/07/1988	

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	205.0	152.650	11/08/1979	0.000	River Dry	27/05/1980
1980-1981	707.1	154.350	24/06/1980	0.000	River Dry	13/06/1980
1981-1982	560.0	154.310	10/07/1981	0.000	River Dry	24/06/1981
1982-1983	664.4	153.990	23/08/1982	0.000	151.545	05/06/1982
1983-1984	715.0	154.550	16/08/1983	0.000	River Dry	08/06/1983
1984-1985	1020	155.405	20/08/1984	0.000	151.510	06/06/1984
1985-1986	444.3	154.075	05/08/1985	0.000	151.375	13/04/1986
1986-1987	958.6	155.190	16/08/1986	0.000	River Dry	16/06/1986
1987-1988	720.0	153.900	26/08/1987	0.000	151.510	14/08/1987
1988-1989	1261	155.400	06/08/1988	0.100	151.460	31/05/1989
1989-1990	401.3	153.945	29/08/1989	0.063	151.435	13/06/1989
1990-1991	920.3	155.095	24/08/1990	2.040	151.715	25/05/1991
1991-1992	1984	155.609	31/07/1991	1.025	151.551	11/07/1991
1992-1993	233.0	153.475	09/09/1992	1.065	151.515	10/07/1992
1993-1994	978.9	154.910	18/07/1993	0.288	151.490	14/06/1993
1994-1995	3072	156.800	02/08/1994	1.000	151.550	09/06/1994
1995-1996	83.50	152.490	26/07/1995	0.000	151.050	30/05/1996

1996-1997	269.0	153.925	08/09/1996	0.000	River Dry	19/06/1996
1997-1998	147.0	152.945	08/09/1997	0.000	150.970	23/06/1997
1998-1999	77.72	152.105	24/09/1998	0.000	151.070	17/05/1999
1999-2000	268.6	153.360	19/07/1999	0.000	151.065	25/04/2000
2000-2001	58.50	152.230	13/07/2000	0.000	River Dry	19/06/2000
2001-2002	118.0	152.125	12/07/2001	0.000	River Dry	09/06/2001
2002-2003	215.2	152.420	04/09/2002	0.000	River Dry	25/12/2002
2003-2004	98.71	152.240	20/09/2003	0.000	151.030	26/03/2004
2004-2005	412.8	154.250	24/08/2004	0.000	151.020	29/05/2005
2005-2006	905.3	155.480	28/07/2005	0.810	151.240	30/04/2006
2006-2007	5179	158.240	19/08/2006	0.000	River Dry	01/06/2006
2007-2008	187.5	153.315	30/08/2007	0.000	151.110	01/06/2007
2008-2009	228.7	153.370	11/07/2008	0.000	151.100	16/05/2009
2009-2010	331.3	153.725	23/07/2009	0.476	151.270	09/07/2009
2010-2011	284.6	153.750	10/09/2010	0.083	151.250	30/04/2011
2011-2012	1195.0	156.650	11/09/2011	0.000	River Dry	22/06/2012
2012-2013	344.8	153.900	08/09/2012	0.000	151.080	01/06/2012
2013-2014	1128	153.805	30/09/2013	0.241	151.26	01/06/2013
2014-2015	1717	154.76	10/09/2014	0.000	151.21	01/06/2014
2015-2016	473.1	154.1	30/07/2015	0.000	151.09	27/04/2016
2016-2017	598.5	154.8	21/08/2016	0.000	151.01	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**

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	151.010	0.000	150.800	0.000	152.280	97.72	152.950	43.88	151.920	34.88	151.650	11.56
2	151.000	0.000	150.780	0.000	152.300	99.25	153.350	133.3	151.910	24.74 *	151.640	11.39
3	151.000	0.000	151.360	3.860 *	152.400	110.1	153.200	121.1	151.860	27.75	151.630	11.20
4	151.000	0.000	151.450	7.988	152.680	140.8	153.000	97.85 *	151.840	12.74	151.630	11.27
5	150.980	0.000	152.200	75.14 *	152.580	131.9	152.930	86.19	151.830	14.10	151.620	11.12
6	150.970	0.000	151.750	28.53 #	152.260	97.60	152.690	71.26	152.450	58.01 #	151.620	10.29 *
7	150.950	0.000	151.640	19.87 #	152.650	137.2 *	152.690	69.25	152.700	75.49 *	151.610	11.09
8	R.Dry	0.000	151.470	7.988	152.500	121.1	152.690	67.19	152.610	68.03	151.610	10.99
9	R.Dry	0.000	151.385	7.560	152.700	145.5	152.650	71.31	152.400	54.66 *	151.600	9.420 #
10	151.000	0.000	151.350	3.480 *	153.225	242.9	152.640	70.18	152.310	48.96	151.600	10.77
11	151.020	0.000	151.350	7.081	153.225	244.0	152.760	79.84 *	152.270	46.17 *	151.600	10.77
12	151.020	0.000	152.300	87.69 #	152.800	152.6	152.720	76.93 #	152.190	41.14 *	151.590	10.37
13	151.020	0.000	152.800	153.9	152.750	145.3	152.690	74.77 *	152.180	42.91	151.590	8.990 *
14	151.030	0.000	152.100	79.85	152.450	107.9 *	152.550	68.49	152.100	39.95	151.590	8.990 *
15	151.030	0.000	151.730	26.87 #	152.500	114.9 *	152.540	67.65	151.940	26.39 #	151.580	10.18
16	151.030	0.000	151.700	24.45 #	152.810	153.4	152.530	57.85	151.920	25.29 *	151.580	10.18
17	151.030	0.000	151.600	17.03	152.550	137.0	152.500	60.59	151.920	25.29 #	151.580	10.15
18	151.020	0.000	151.560	14.36 #	152.400	110.1	152.470	59.37 *	151.920	25.29 #	151.580	10.18
19	151.020	0.000	151.580	15.67 #	152.520	122.4	152.460	47.58	151.910	24.74 #	151.580	10.46
20	151.020	0.000	151.520	8.360	152.660	144.0	152.460	61.40	151.900	24.19 #	151.580	8.570 *
21	150.940	0.000	151.500	6.944	154.800	598.5 #	152.250	48.64	151.850	21.51 #	151.580	10.19
22	150.930	0.000	151.500	6.896	154.400	494.6 #	152.230	47.30	151.830	20.46 #	151.580	10.36
23	150.930	0.000	151.490	10.11 #	154.350	482.1 #	152.230	47.28	151.800	18.90 *	151.580	10.18
24	150.930	0.000	151.500	10.69 *	152.900	168.6	152.240	47.89	151.780	17.89 #	151.600	9.420 *
25	150.920	0.000	151.600	17.03 #	153.400	279.7	152.250	44.90 *	151.750	16.39 #	151.600	10.77
26	150.920	0.000	151.920	52.03	152.950	173.4	152.260	48.80	151.640	11.29	151.600	10.72
27	150.910	0.000	151.800	32.85 #	152.850	160.3	152.250	48.04	151.650	10.63	151.600	0.000
28	150.910	0.000	152.850	160.3	152.800	160.9 *	152.240	46.88	151.700	13.96 #	151.600	10.75
29	150.800	0.000	152.350	97.80	153.200	242.4	152.240	46.56	151.730	15.44 #	151.610	10.59
30	150.800	0.000	152.300	83.98	152.700	138.9	152.220	45.40	151.670	12.55 *	151.620	11.12
31			152.550	122.2 *	152.780	146.8			151.660	12.09 *		
Ten-Daily Mean												
I Ten-Daily	150.989	0.000	151.418	15.44	152.557	132.4	152.879	83.16	152.183	41.94	151.621	10.91
II Ten-Daily	151.024	0.000	151.824	43.53	152.667	143.2	152.568	65.45	152.025	32.14	151.585	9.884
III Ten-Daily	150.899	0.000	151.942	54.62	153.375	276.9	152.241	47.17	151.733	15.56	151.597	9.410
Monthly												
Min.	150.800	0.000	150.780	0.000	152.260	97.60	152.220	43.88	151.640	10.63	151.580	0.000
Max.	151.030	0.000	152.850	160.3	154.800	598.5	153.350	133.3	152.700	75.49	151.650	11.56
Mean	150.969	0.000	151.735	38.4	152.883	187.2	152.563	65.26	151.972	29.41	151.601	10.07

Annual Runoff in MCM = 985 Annual Runoff in mm = 118

Peak Observed Discharge = 598.5 cumecs on 21/08/2016 Corres. Water Level :154.8 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :151.01 m

Note: River was in pooling condition from 19/04/2017 to 31/05/2017

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 Data for the period 2016 - 2017

Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	151.620	11.12	151.630	10.73 *	151.650	11.35	151.550	6.698	151.500	6.463	151.330	0.000
2	151.620	10.29 *	151.640	11.21	151.660	12.09 *	151.550	6.906	151.500	5.370 *	151.320	0.000
3	151.620	11.12	151.640	11.16	151.660	11.49	151.550	6.276	151.500	6.347	151.320	0.000
4	151.620	10.29 *	151.640	11.07	151.660	11.49	151.560	6.923	151.500	6.347	151.320	0.000
5	151.630	11.25	151.640	11.35	151.660	12.09 *	151.560	7.730 *	151.490	6.238	151.320	0.000
6	151.630	11.22	151.640	11.26	151.660	12.09 *	151.560	7.730 *	151.490	5.000 *	151.320	0.000
7	151.630	11.18	151.640	10.93	151.650	11.35	151.570	8.150 *	151.480	4.008	151.320	0.000
8	151.630	11.12	151.640	11.29	151.640	10.84	151.570	7.047	151.460	4.040	151.320	0.000
9	151.630	11.23	151.640	11.18 *	151.640	10.84	151.570	7.041	151.450	3.580 *	151.310	0.000
10	151.630	11.18	151.650	11.16	151.630	10.22	151.570	7.041	151.450	3.679	151.310	0.000
11	151.630	10.73 *	151.650	11.86	151.630	10.21	151.570	6.974	151.440	3.497	151.310	0.000
12	151.630	10.73 *	151.650	11.85	151.630	10.73 *	151.570	8.150 *	151.430	3.321	151.310	0.000
13	151.630	11.27	151.650	11.85	151.630	10.17	151.570	8.150 *	151.420	2.600 *	151.310	0.000
14	151.640	11.35	151.650	12.01	151.620	8.800	151.570	6.974	151.420	2.600 *	151.300	0.000
15	151.640	11.18 *	151.650	11.63 *	151.620	8.806	151.560	6.923	151.410	2.254	151.300	0.000
16	151.640	11.20	151.650	11.92	151.620	8.382	151.560	6.923	151.400	1.990 *	151.290	0.000
17	151.640	11.22	151.650	11.15	151.620	8.382	151.560	7.730 *	151.390	1.770	151.280	0.000
18	151.640	11.18 *	151.650	11.48	151.620	8.382	151.560	6.902	151.380	1.212	151.280	0.000
19	151.640	11.20	151.650	11.48	151.620	10.29 *	151.550	7.330 *	151.380	0.000	151.280	0.000
20	151.640	11.34	151.650	11.39	151.610	7.974	151.550	6.793	151.380	0.000	151.270	0.000
21	151.640	11.32	151.650	11.63 *	151.610	8.035	151.550	6.746	151.370	0.000	151.270	0.000
22	151.630	11.12	151.650	11.63 *	151.610	7.971	151.550	6.635	151.350	0.000	151.270	0.000
23	151.630	11.08	151.650	11.35	151.610	7.567	151.540	6.920 *	151.350	0.000	151.270	0.000
24	151.630	10.99	151.650	11.55	151.610	0.000	151.520	6.374	151.350	0.000	151.270	0.000
25	151.630	10.73 *	151.650	11.55	151.600	7.567	151.520	5.810	151.330	0.000	151.260	0.000
26	151.630	11.08	151.650	11.63 *	151.600	9.420 *	151.500	5.370 *	151.330	0.000	151.260	0.000
27	151.630	10.99	151.650	11.49	151.600	7.535	151.500	5.370 *	151.330	0.000	151.260	0.000
28	151.630	11.27	151.650	11.71	151.545	7.120 *	151.500	5.370 *	151.330	0.000	151.260	0.000
29	151.630	11.32	151.650	11.63 *			151.490	5.000 *	151.330	0.000	151.260	0.000
30	151.630	10.73 *	151.650	11.49			151.490	5.000 *	151.330	0.000	151.260	0.000
31	151.630	10.73 *	151.650	11.79			151.490	5.000 *			151.250	0.000
Ten-Daily Mean												
I Ten-Daily	151.626	11.00	151.640	11.13	151.651	11.39	151.561	7.154	151.482	5.107	151.319	0.000
II Ten-Daily	151.637	11.14	151.650	11.66	151.622	9.213	151.562	7.285	151.405	1.924	151.293	0.000
III Ten-Daily	151.631	11.03	151.650	11.59	151.598	6.902	151.514	5.781	151.340	0.000	151.263	0.000
Monthly												
Min.	151.620	10.29	151.630	10.73	151.545	0.000	151.490	5.000	151.330	0.000	151.250	0.000
Max.	151.640	11.35	151.650	12.01	151.660	12.09	151.570	8.150	151.500	6.463	151.330	0.000
Mean	151.631	11.06	151.647	11.46	151.626	9.329	151.545	6.709	151.409	2.344	151.291	0.000

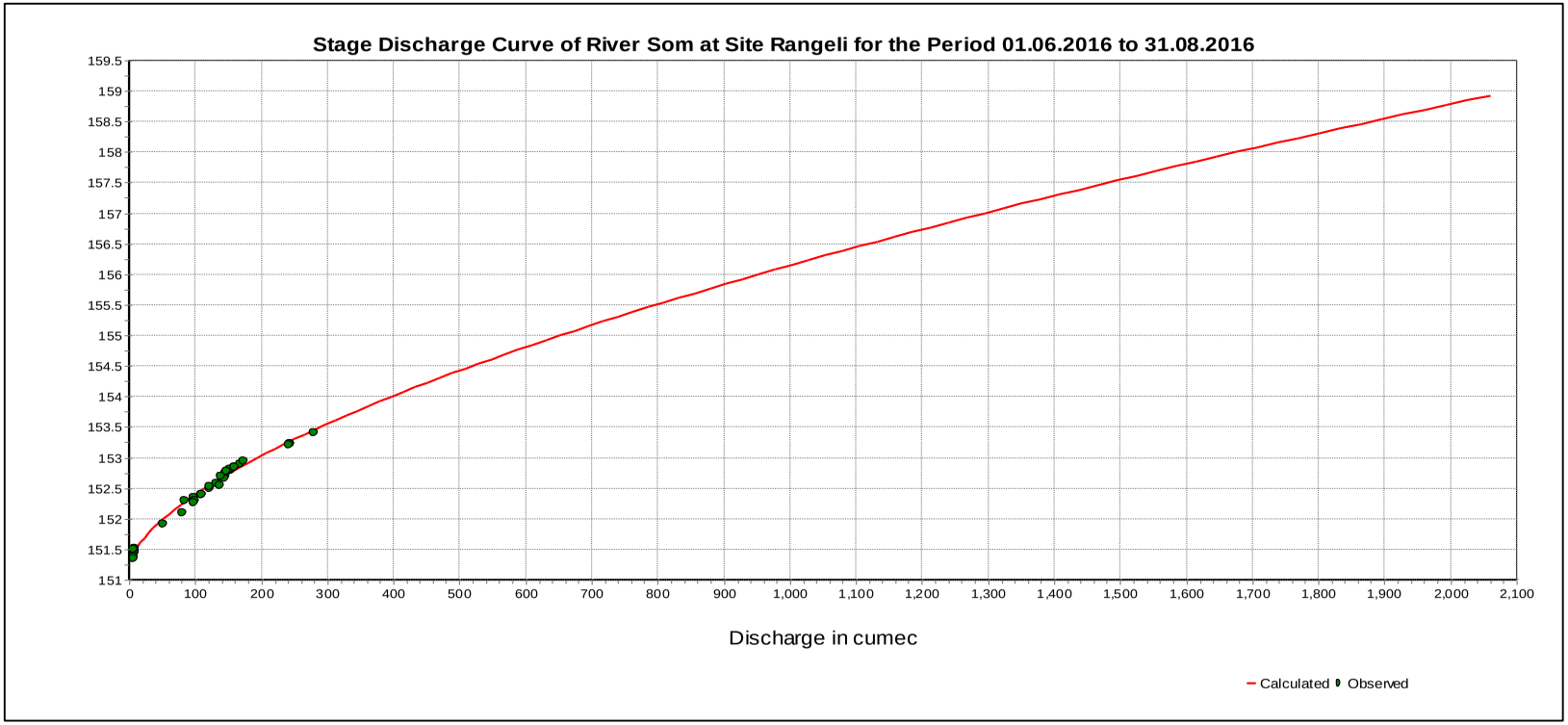
Peak Computed Discharge = 160.9 cumecs on 28/08/2016 Corres. Water Level :152.8 m

Lowest Computed Discharge = 1.990 cumecs on 16/04/2017 Corres. Water Level :151.4 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)

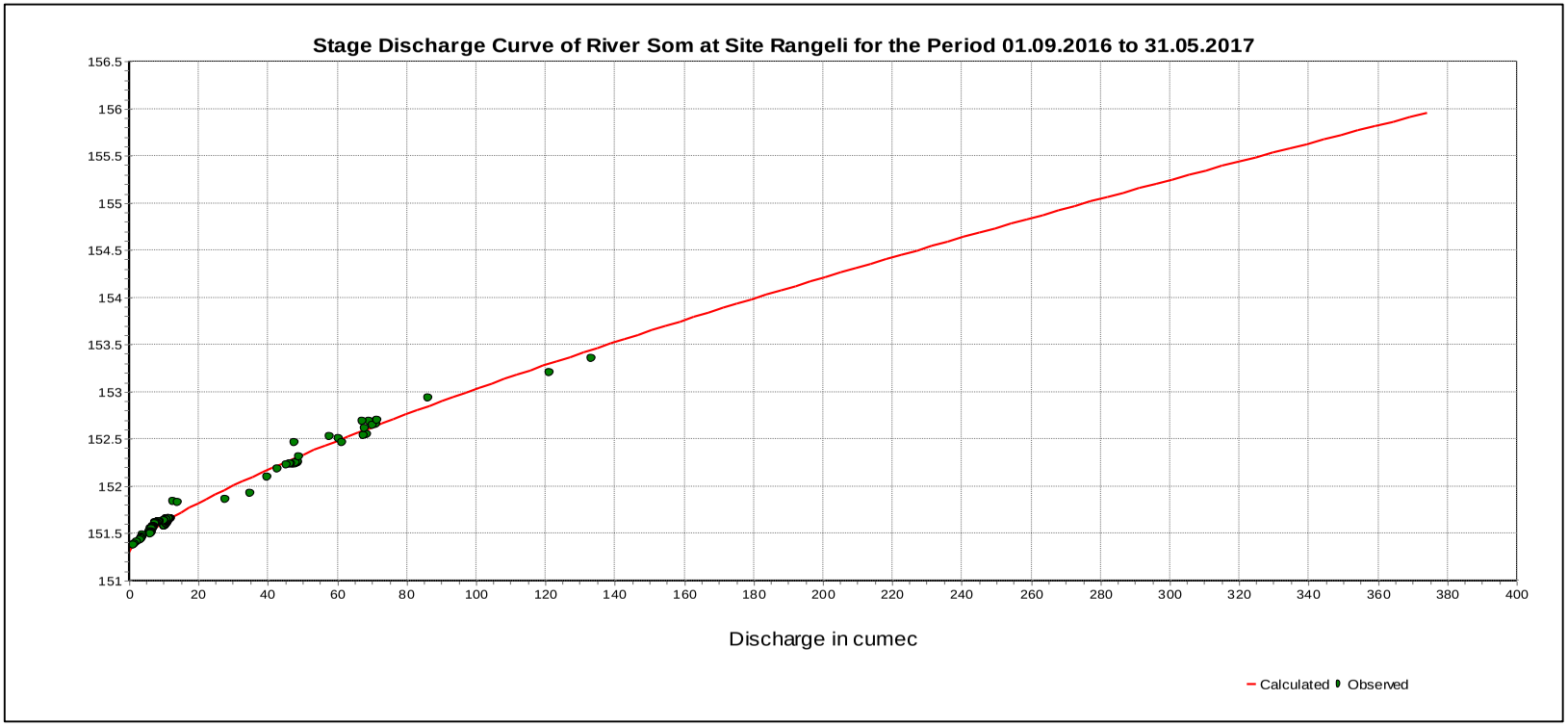
Note:Missing values ignored while arriving at Annual Runoff



Procedure : Standard

Equation type: Power $Q=(a+h)^{b}*c$

LB	UB	a	b	c
151.3	159	-151.2	1.62	75.141



Procedure : Standard

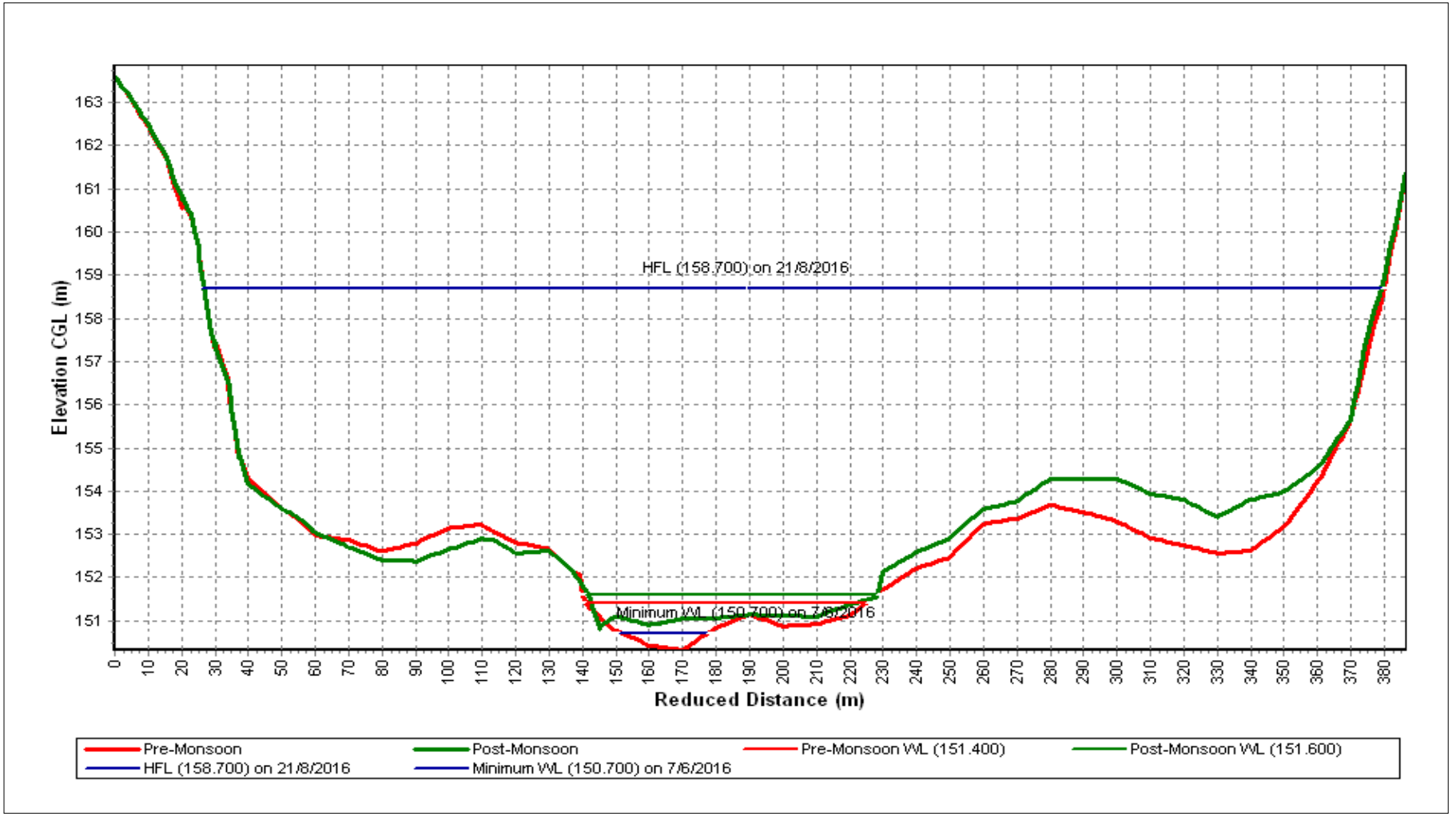
Equation type: Power $Q=(a+h)^{b}*c$

LB	UB	a	b	c
151.3	156	-151.31	1.328	48.747

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

Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**



Historical Flood level - 160.86 m on 19.08.2006 at 1700 hrs

Note: HFL marked on graph denotes Max Water Level observed during the Water Year 2016-17

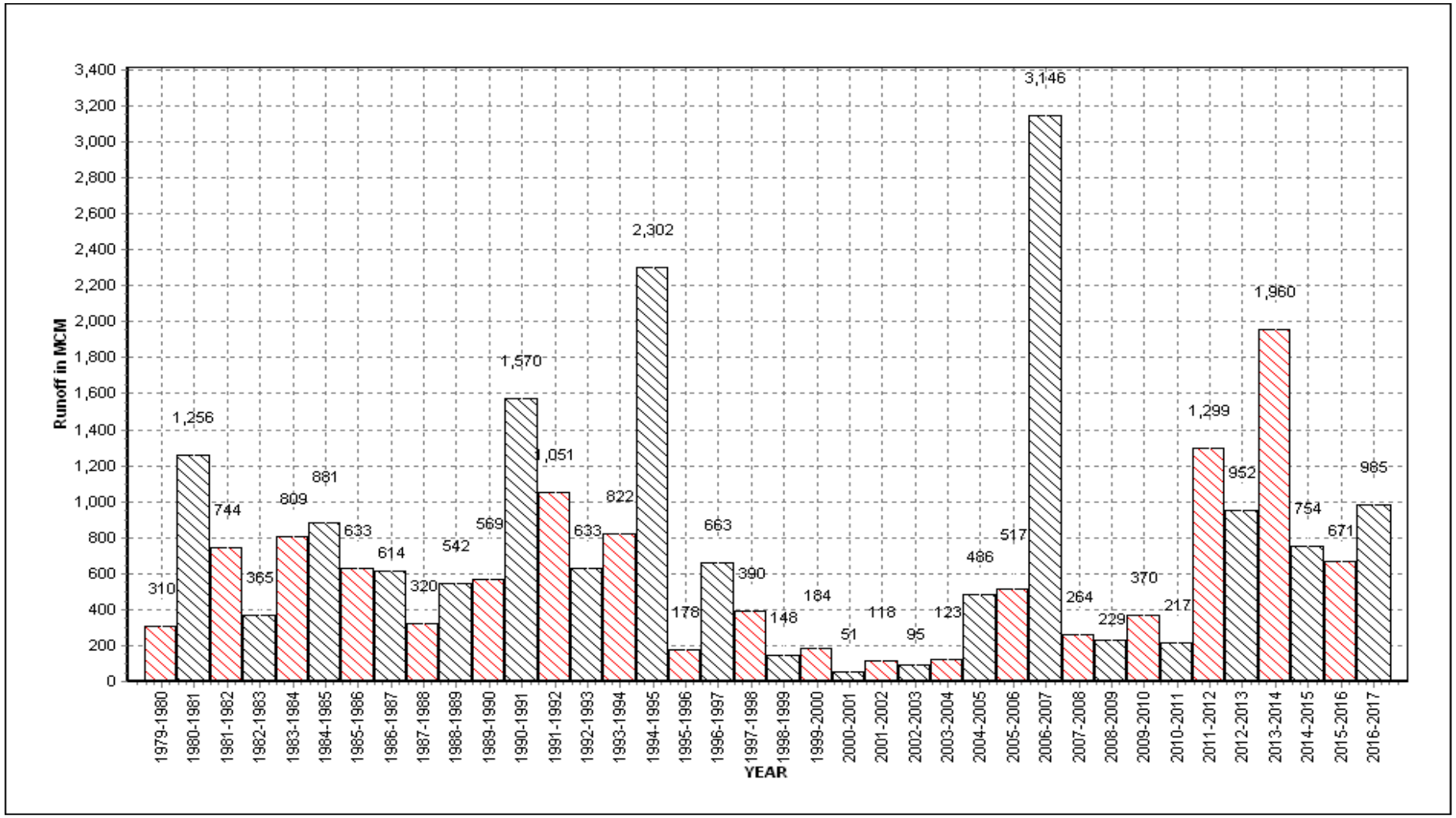
Annual Runoff Values for the period: 1979 - 2017

Station Name : Som at Rangeli (01 02 13 005)

Local River : Som

Division : Mahi Division, Gandhinagar

Sub-Division : Mahi Sub Divn., Kadana

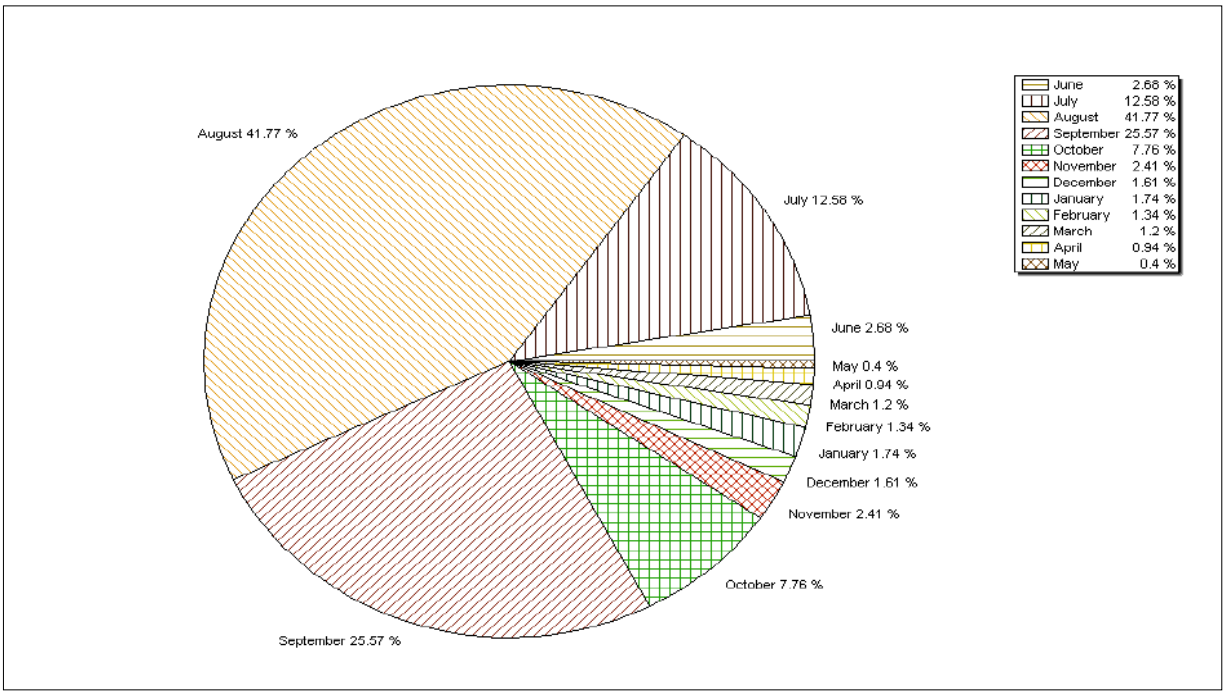


Note: Missing values have not been considered while arriving at Annual Runoff

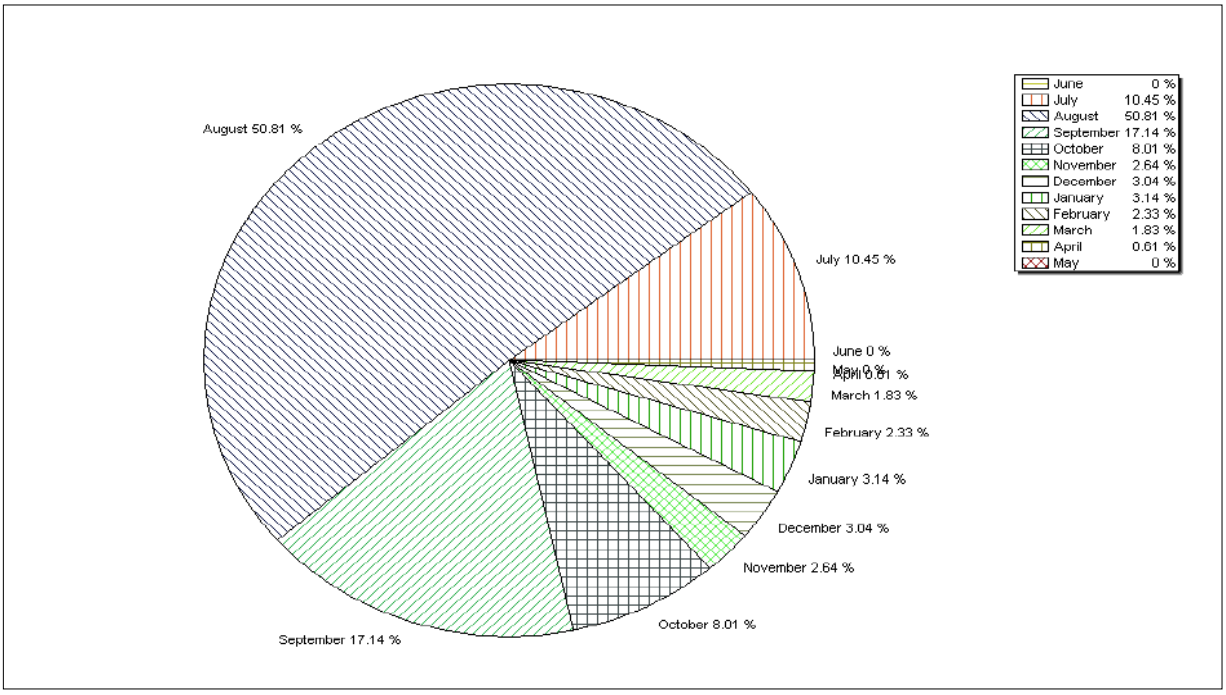
Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1979-2016



Monthly Runoff for the Year : 2016-2017

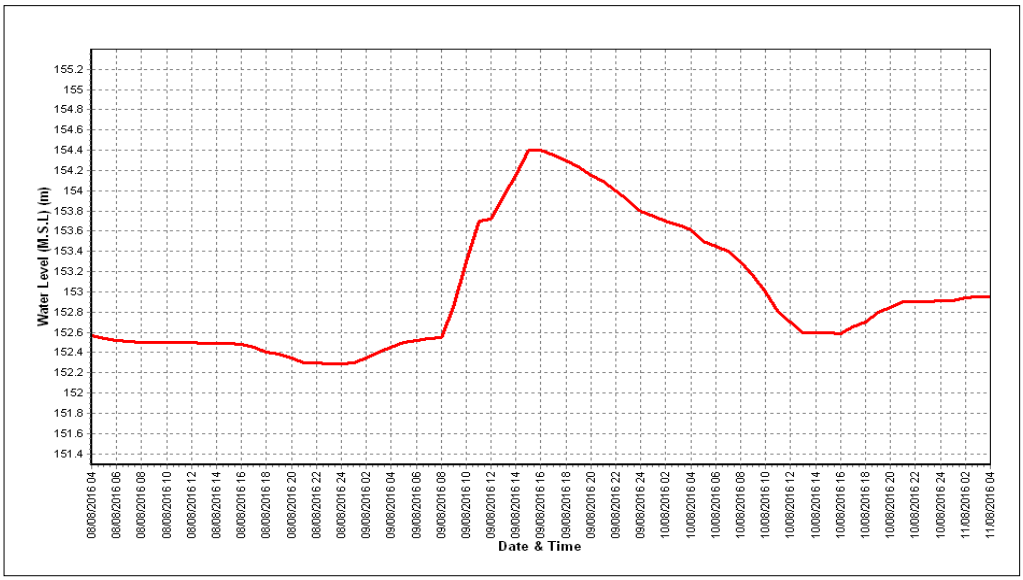


Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

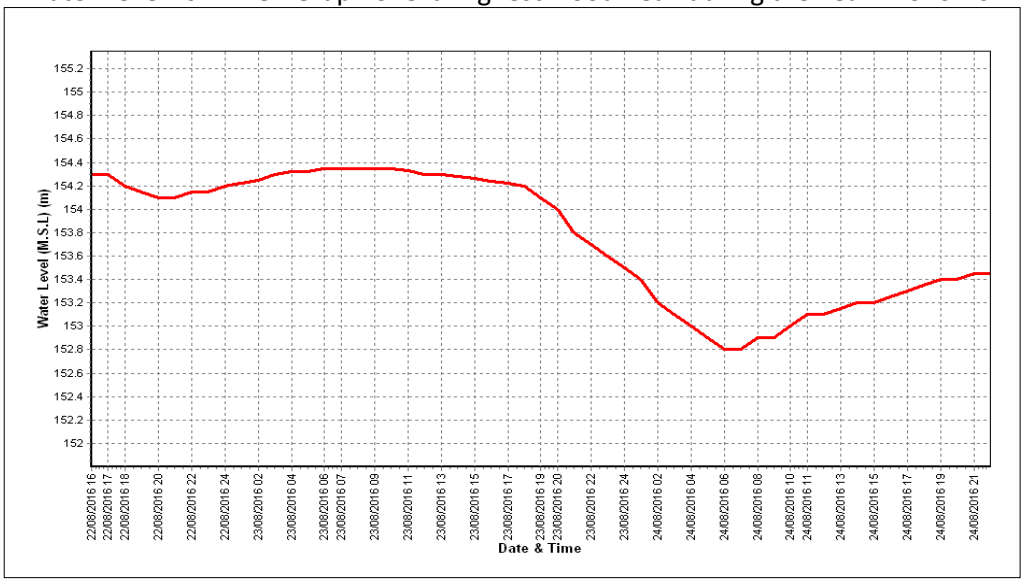
Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**

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

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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-17

Site	**:**	**Jakham at Dhariawad**	**Code**	**:**	**01 02 13 004**
State	:	Rajasthan	District		Udaipur
			Independent		
Basin	:	Mahi	River	:	Mahi
Tributary	:	Jakham	Sub Tributary	:	
Sub-Sub	:		Local River	:	Jakham
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Mahi Sub Divn., Kadana
Drainage Area	:	1510 Sq. Km.	Bank	:	Right
Latitude	:	24°04'43" N	Longitude	:	74°28'02" E
Zero of Gauge	:	203 (m.s.l)	17/07/1984		-
		Opening Date	Closing Date		
Gauge	:	17/07/1984			
Discharge	:	01/06/1988			
Sediment	:	-			
Water Quality	:	-			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1988-1989	219.3	204.080	05/08/1988	0.000	River Dry	01/04/1989
1989-1990	Data not published					
1990-1991	484.2	206.300	07/09/1990	0.000	River Dry	23/05/1991
1991-1992	278.9	205.460	25/08/1991	0.000	203.170	11/12/1991
1992-1993	25.47	204.650	17/08/1992	0.060	203.120	08/06/1992
1993-1994	210.2	203.890	16/08/1993	0.040	203.120	06/06/1993
1994-1995	281.7	206.600	03/09/1994	0.000	203.250	11/06/1994
1995-1996	21.58	204.250	25/07/1995	0.000	203.270	25/02/1996
1996-1997	295.1	205.980	16/09/1996	0.000	203.100	16/06/1996
1997-1998	41.00	204.525	10/09/1997	0.000	203.190	05/07/1997
1998-1999	12.37	204.030	18/10/1998	0.000	203.240	07/04/1999
1999-2000	51.60	204.440	31/07/1999	0.000	203.140	17/05/2000
2000-2001	265.4	205.780	21/07/2000	0.000	203.180	25/01/2001
2001-2002	16.10	204.100	08/07/2001	0.000	River Dry	06/06/2001
2002-2003	64.41	204.560	06/09/2002	0.000	203.200	24/12/2002
2003-2004	17.25	204.400	25/09/2003	0.000	203.190	07/04/2004
2004-2005	682.4	207.350	24/08/2004	0.000	203.300	02/04/2005
2005-2006	939.8	207.600	28/07/2005	0.582	203.360	05/09/2005
2006-2007	1980	209.350	11/08/2006	0.285	203.360	12/12/2006
2007-2008	198.1	205.450	21/08/2007	0.000	203.280	01/06/2007
2008-2009	533.5	206.590	11/07/2008	0.410	203.380	12/06/2008
2009-2010	396.7	206.500	23/07/2009	0.498	203.370	20/10/2009
2010-2011	397.8	206.450	10/09/2010	0.658	203.390	03/03/2011
2011-2012	1296.7	208.000	12/09/2011	0.000	203.350	15/04/2012
2012-2013	211.1	205.500	16/08/2012	0.000	River Dry	01/06/2012
2013-2014	331.7	206.3	14/08/2013	0.000	203.29	01/06/2013
2014-2015	24.37	204.16	12/09/2014	0.000	203.34	01/06/2014
2015-2016	491.3	206.8	26/07/2015	0.000	203.35	16/06/2015
2016-2017	1038	208.000	22/08/2016	0.000	203.360	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Jakham at Dhariawad (01 02 13 004) **Division : Mahi Division, Gandhinagar**

Local River : Jakham **Sub-Division : Mahi Sub Divn., Kadana**

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	203.360	0.000	203.400	0.000	203.995	12.18	204.730	56.18	203.580	2.240	203.660	3.342
2	203.360	0.000	203.390	0.000	205.678	167.9	204.840	65.79	203.670	3.840 *	203.650	3.217
3	203.350	0.000	203.380	0.000	204.450	39.41	204.898	69.74	203.929	13.26	203.640	3.169
4	203.350	0.000	206.100	279.8	204.300	29.16	204.760	58.62 *	204.000	14.82	203.640	3.179
5	203.350	0.000	203.540	1.630	204.040	13.00	204.700	53.31	204.210	20.61 #	203.630	3.043
6	203.340	0.000	203.400	0.000	204.110	15.54	204.650	51.70	204.500	37.58 #	203.600	2.790 *
7	203.340	0.000	203.380	0.000	204.260	23.09 *	204.600	45.34	204.460	34.85 #	203.560	2.375
8	203.340	0.000	203.380	0.000	204.230	21.27	204.540	40.44 #	204.140	17.43 #	203.530	2.141
9	203.340	0.000	203.370	0.000	205.300	123.0 #	204.500	37.37	204.120	16.30 *	203.520	2.092
10	203.330	0.000	203.420	0.000	204.680	59.78	204.450	31.46	204.100	15.77 #	203.510	2.022
11	203.330	0.000	204.360	29.64	204.600	53.70	204.370	29.18 *	204.080	14.97 *	203.500	1.985
12	203.330	0.000	204.140	17.99	204.500	45.53	204.300	19.77	204.060	14.20 *	203.500	1.984
13	203.330	0.000	204.270	24.79	204.480	39.89	204.230	21.58 *	204.030	15.25	203.500	1.640 *
14	203.330	0.000	203.677	2.539	204.650	49.00 *	204.170	16.69	204.010	14.89	203.500	1.640 *
15	203.320	0.000	203.550	1.668	204.680	51.51 *	204.160	17.48	203.990	14.38	203.510	2.025
16	203.320	0.000	203.510	1.313	204.540	45.13	204.150	15.91	203.950	10.42 *	203.520	2.125
17	203.320	0.000	203.490	1.540 *	204.640	54.74	204.140	15.69	203.880	10.56	203.520	2.143
18	203.320	0.000	203.480	1.256	204.630	51.86	204.120	16.59 *	203.820	5.746	203.530	2.201
19	203.310	0.000	203.460	1.191	204.620	49.69	204.120	14.30	203.800	5.362	203.540	2.313
20	203.310	0.000	203.450	1.080	204.680	57.86	203.890	10.97	203.770	4.678	203.550	2.170 *
21	203.310	0.000	203.450	1.070	High flood	0.000	203.860	8.636	203.740	4.334	203.560	2.375
22	203.250	0.000	203.440	0.937	208.000	1038	203.700	3.328	203.670	3.113	203.570	2.444
23	203.360	0.000	203.440	0.925	206.320	260.0	203.630	2.616	203.620	3.070 *	203.580	2.530 *
24	203.370	0.000	203.470	1.360 *	205.717	179.5	203.685	2.865	203.570	2.214	203.590	2.660 *
25	203.350	0.000	204.606	54.37	206.340	343.4 #	203.940	10.11 *	203.520	1.810	203.600	2.608
26	203.340	0.000	203.740	3.812	205.110	85.99	203.950	12.09	203.500	1.690	203.600	2.808
27	203.340	0.000	204.270	28.45	204.930	73.33	203.860	10.04	203.680	3.484	203.600	2.790 *
28	203.330	0.000	204.800	71.37	204.780	60.49 *	203.760	3.719	203.700	3.744	203.580	2.530 *
29	203.360	0.000	204.220	25.12	204.760	56.73	203.620	2.587	203.700	3.763	203.580	2.530 *
30	203.420	0.000	204.140	18.85	204.690	52.87	203.600	2.435	203.690	4.180 *	203.570	2.400 *
31			204.360	28.59 *	204.680	50.64			203.670	3.496		
Ten-Daily Mean												
I Ten-Daily	203.346	0.000	203.676	28.14	204.504	50.43	204.667	51.00	204.071	17.67	203.594	2.737
II Ten-Daily	203.322	0.000	203.739	8.300	204.602	49.89	204.165	17.82	203.939	11.05	203.517	2.023
III Ten-Daily	203.343	0.000	203.994	21.35	205.533	220.1	203.760	5.843	203.642	3.172	203.583	2.567
Monthly												
Min.	203.250	0.000	203.370	0.000	203.995	12.18	203.600	2.435	203.500	1.690	203.500	1.640
Max.	203.420	0.000	206.100	279.8	208.000	1038	204.898	69.74	204.500	37.58	203.660	3.342
Mean	203.337	0	203.809	19.33	204.880	106.8	204.197	24.88	203.876	10.39	203.565	2.442

Annual Runoff in MCM = 455 Annual Runoff in mm = 301

Peak Observed Discharge = 1038 cumecs on 22/08/2016 Corres. Water Level :208 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :203.36 m

Note : From 01/06/2016 to 03/07/2016, 6/07/2016 to 10/06/2017 and 10/04/2017 to 30/05/2017

river in pooling condition

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 Data for the period 2016 - 2017

Station Name : Jakham at Dhariawad (01 02 13 004) **Division : Mahi Division, Gandhinagar**

Local River : Jakham **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	203.570	2.400 *	203.590	2.660 *	203.650	3.216	203.610	3.149	203.450	1.200 *	203.390	0.000
2	203.570	2.394	203.580	2.952	203.650	3.035	203.620	3.041	203.440	1.120 *	203.390	0.000
3	203.560	2.280 *	203.580	2.707	203.660	3.374	203.630	3.258	203.440	1.120 *	203.380	0.000
4	203.560	2.280 *	203.580	2.693	203.660	3.463	203.630	3.220 *	203.430	1.050 *	203.380	0.000
5	203.550	2.170 *	203.590	2.807	203.660	3.680 *	203.760	5.520 *	203.430	1.050 *	203.380	0.000
6	203.550	2.170 *	203.600	2.787	203.670	3.840 *	203.780	4.053	203.420	0.970 *	203.380	0.000
7	203.550	2.264	203.600	2.813	203.670	3.621	203.760	3.761	203.420	0.970 *	203.380	0.000
8	203.550	2.262	203.600	2.790 *	203.660	3.621	203.750	3.669	203.410	0.910 *	203.380	0.000
9	203.560	2.364	203.600	2.932	203.660	3.475	203.740	5.110 *	203.410	0.910 *	203.380	0.000
10	203.560	2.404	203.590	2.650	203.630	3.233	203.740	3.522	203.400	0.000	203.380	0.000
11	203.540	2.050 *	203.550	2.278	203.600	2.790 *	203.720	3.209	203.400	0.000	203.380	0.000
12	203.520	1.840 *	203.530	2.153	203.590	2.660 *	203.700	4.360 *	203.400	0.000	203.380	0.000
13	203.480	1.732	203.500	2.004	203.580	2.765	203.680	4.010 *	203.400	0.000	203.370	0.000
14	203.480	1.713	203.500	2.015	203.550	2.317	203.670	3.840 *	203.400	0.000	203.370	0.000
15	203.480	1.732	203.490	1.540 *	203.520	2.199	203.650	3.520 *	203.400	0.000	203.370	0.000
16	203.500	1.992	203.480	1.741	203.510	2.084	203.620	3.153	203.400	0.000	203.370	0.000
17	203.500	1.994	203.480	1.741	203.510	2.075	203.610	3.019	203.400	0.000	203.370	0.000
18	203.520	1.840 *	203.510	2.107	203.520	2.127	203.600	2.923	203.400	0.000	203.370	0.000
19	203.520	2.143	203.520	2.175	203.530	1.940 *	203.580	2.530 *	203.400	0.000	203.370	0.000
20	203.530	2.235	203.530	2.200	203.540	2.286	203.570	2.400 *	203.400	0.000	203.370	0.000
21	203.540	0.000	203.550	2.317	203.560	2.468	203.560	2.280 *	203.390	0.000	203.360	0.000
22	203.550	2.187	203.560	2.280 *	203.560	2.496	203.550	2.170 *	203.390	0.000	203.330	0.000
23	203.560	2.280 *	203.570	2.403	203.570	2.640	203.540	2.050 *	203.390	0.000	203.320	0.000
24	203.560	2.280 *	203.580	2.700	203.570	2.400 *	203.520	1.840 *	203.390	0.000	203.310	0.000
25	203.560	2.280 *	203.590	2.820	203.580	2.607	203.510	1.740 *	203.390	0.000	203.300	0.000
26	203.580	2.530 *	203.600	2.790 *	203.580	2.530 *	203.500	1.640 *	203.390	0.000	203.290	0.000
27	203.580	2.530 *	203.600	2.845	203.600	2.903	203.500	1.640 *	203.390	0.000	203.280	0.000
28	203.580	2.530 *	203.600	2.858	203.600	2.955	203.470	1.360 *	203.390	0.000	203.280	0.000
29	203.590	2.660 *	203.620	3.070 *			203.460	1.280 *	203.390	0.000	203.270	0.000
30	203.590	2.660 *	203.640	3.214			203.460	1.280 *	203.390	0.000	203.270	0.000
31	203.590	2.782	203.650	3.241			203.450	1.200 *			203.260	0.000
Ten-Daily Mean												
I Ten-Daily	203.558	2.299	203.591	2.779	203.657	3.456	203.702	3.830	203.425	0.930	203.382	0.000
II Ten-Daily	203.507	1.927	203.509	1.995	203.545	2.324	203.640	3.296	203.400	0.000	203.372	0.000
III Ten-Daily	203.571	2.247	203.596	2.776	203.577	2.625	203.502	1.680	203.390	0.000	203.297	0.000
Monthly												
Min.	203.480	0.000	203.480	1.540	203.510	1.940	203.450	1.200	203.390	0.000	203.260	0.000
Max.	203.590	2.782	203.650	3.241	203.670	3.840	203.780	5.520	203.450	1.200	203.390	0.000
Mean	203.546	2.161	203.566	2.525	203.594	2.814	203.611	2.895	203.405	0.31	203.349	0

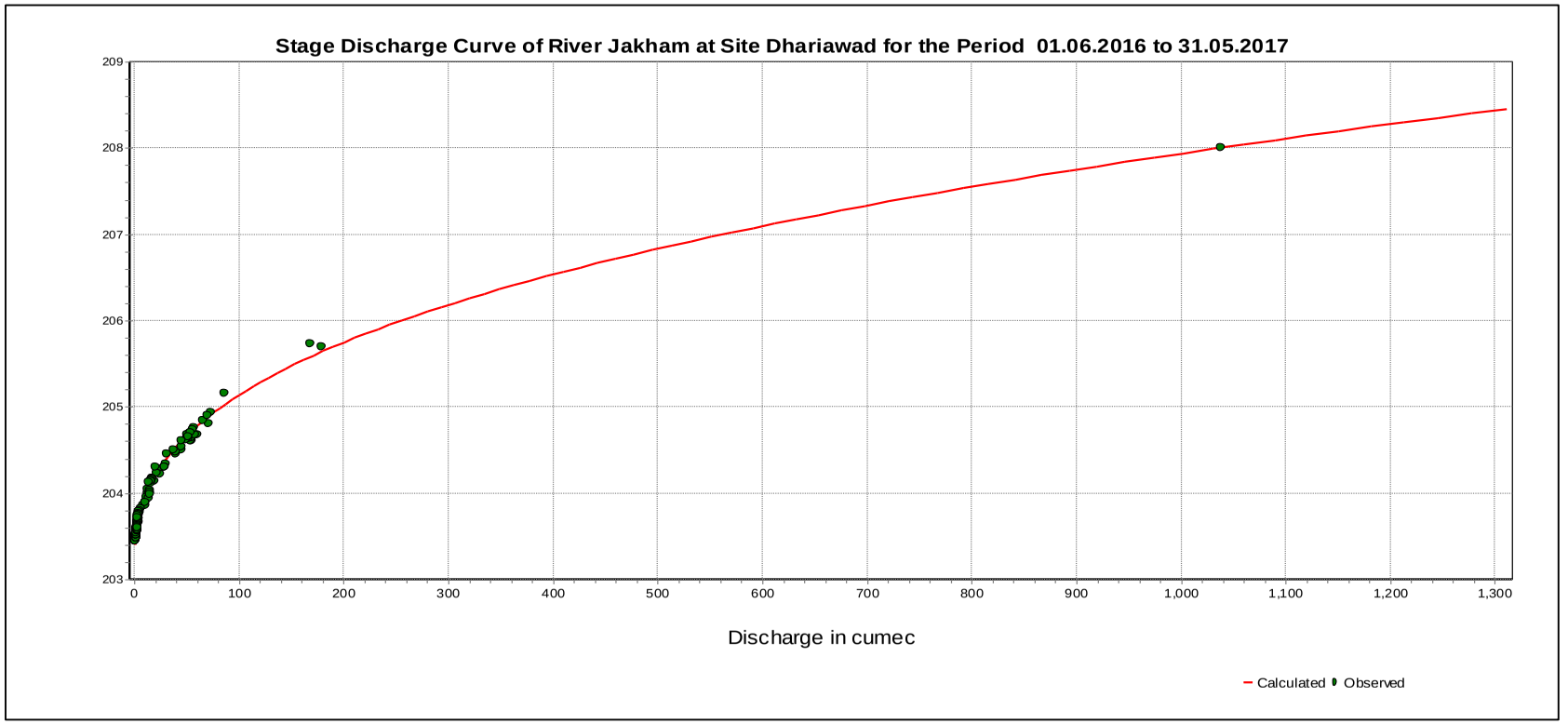
Peak Computed Discharge = 60.49 cumecs on 28/08/2016 Corres. Water Level :204.78 m

Lowest Computed Discharge = 0.910 cumecs on 08/04/2017 Corres. Water Level :203.41 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)

Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

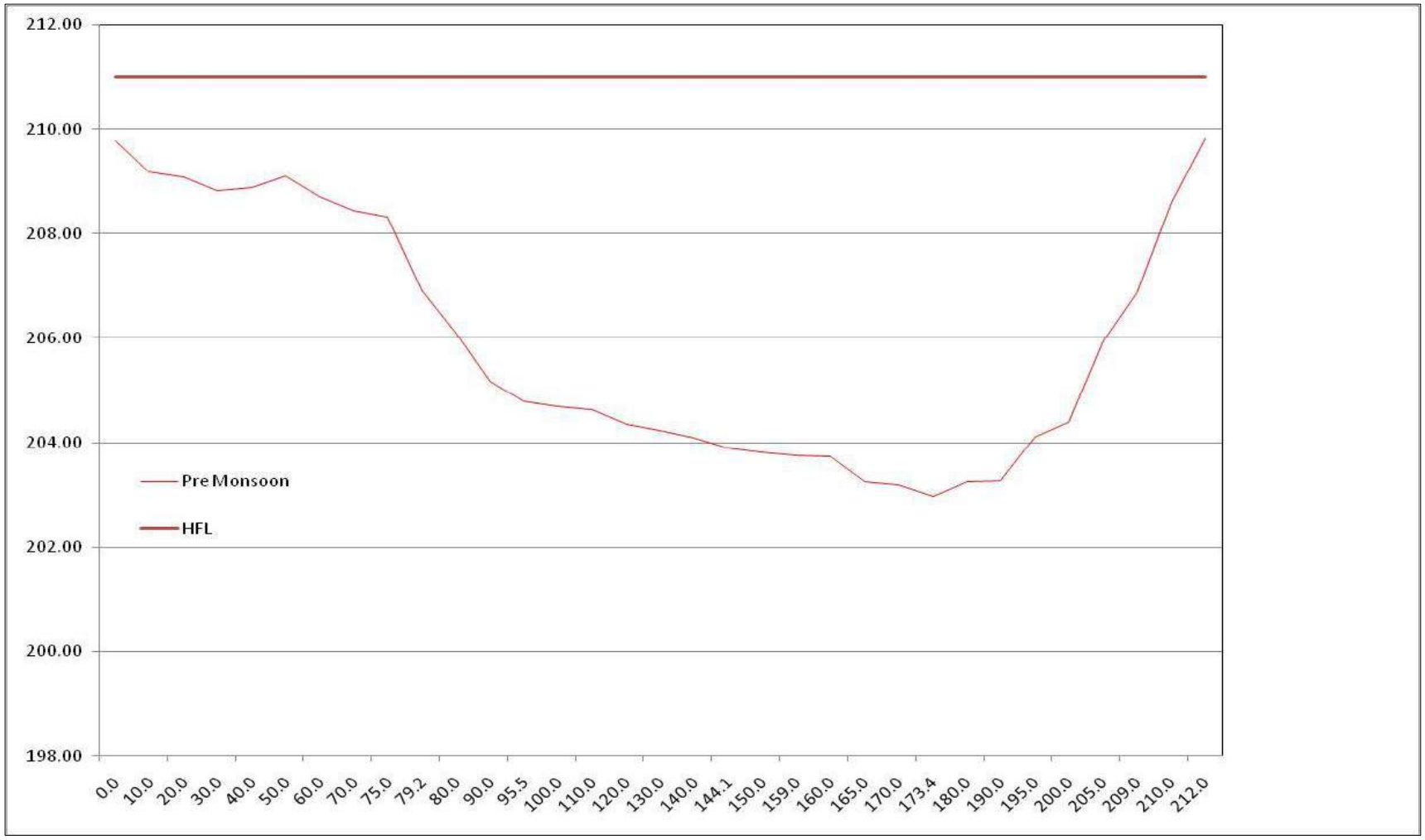
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
203.4	208.5	-203.04	2.713	13.46

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

Station Name : Jakham at Dhariawad (01 02 13 004) **Division : Mahi Division, Gandhinagar**

Local River : Jakham **Sub-Division : Mahi Sub Divn., Kadana**



Highest flood level observed : 211.0 m dt 21/08/16 at 08:00 hrs

HFL in graph shows Max Water level observed during 2016-17

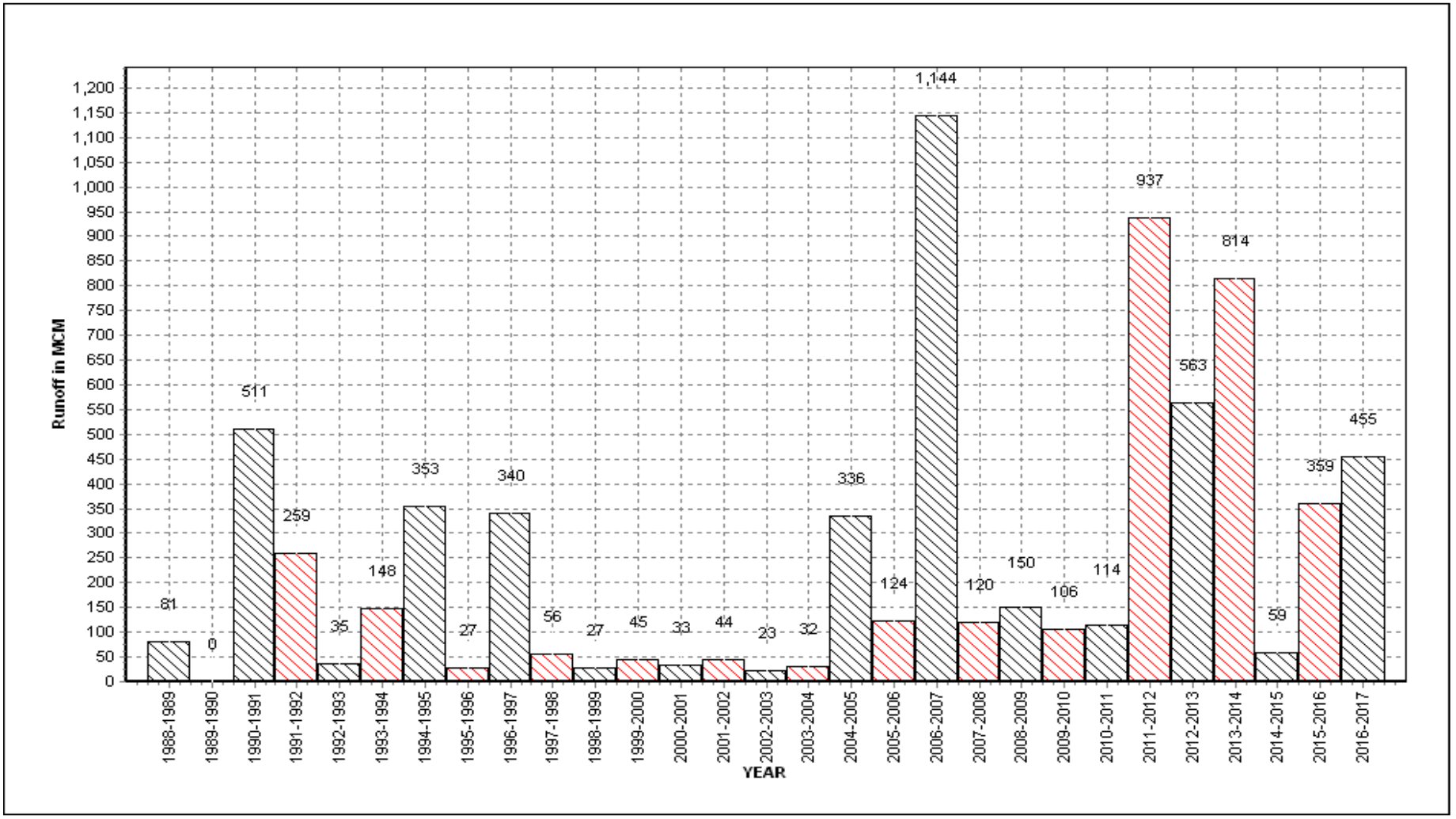
Annual Runoff Values for the period: 1988 - 2017

Station Name : Jakham at Dhariawad (01 02 13 004)

Local River : Jakham

Division : Mahi Division, Gandhinagar

Sub-Division : Mahi Sub Divn., Kadana

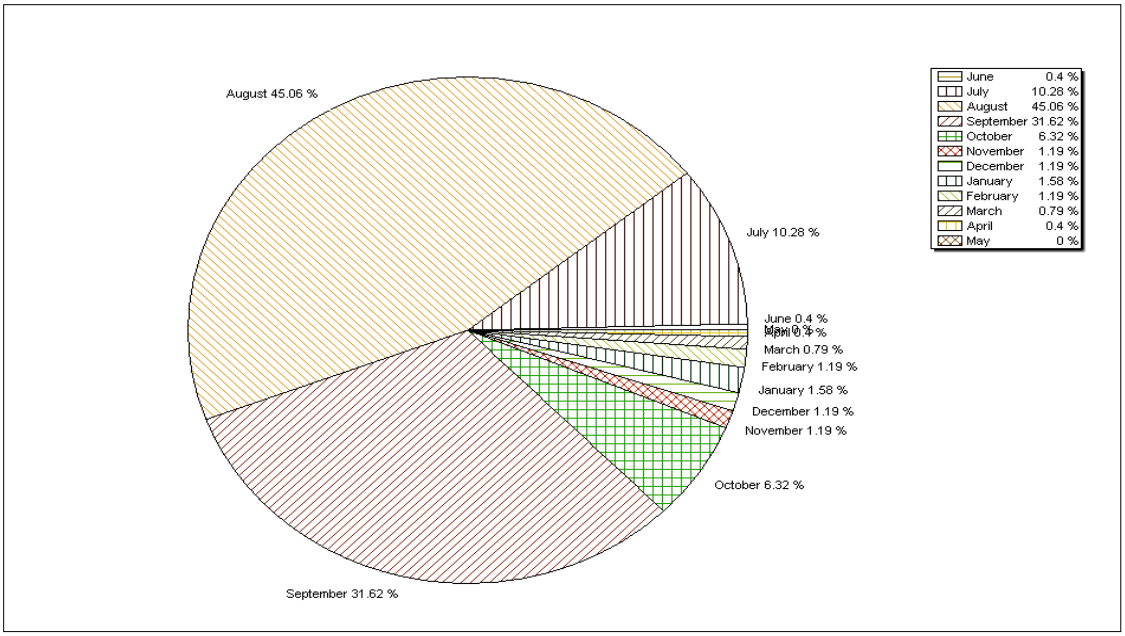


Note: Missing values have not been considered while arriving at Annual Runoff

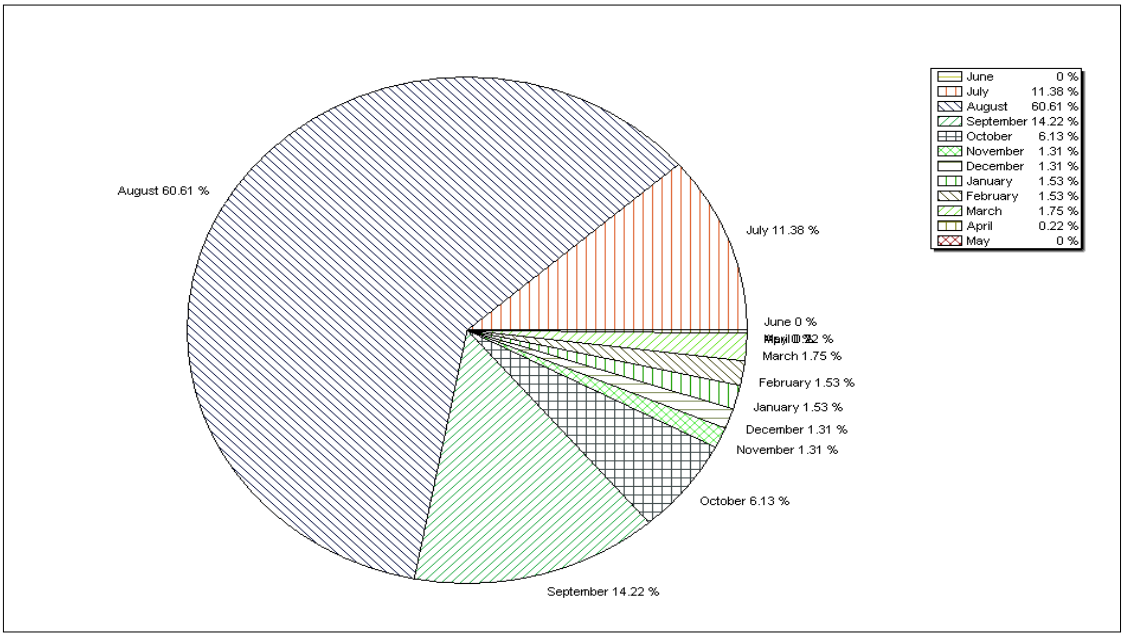
Station Name : Jakham at Dhariawad (01 02 13 004) **Division : Mahi Division, Gandhinagar**

Local River : Jakham **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1988-2016

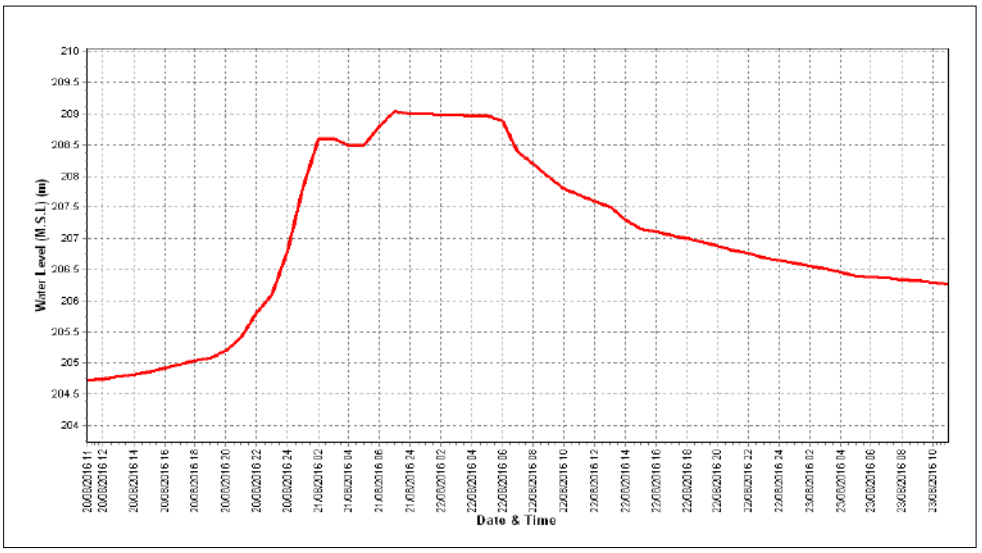


Monthly Runoff for the Year : 2016-2017

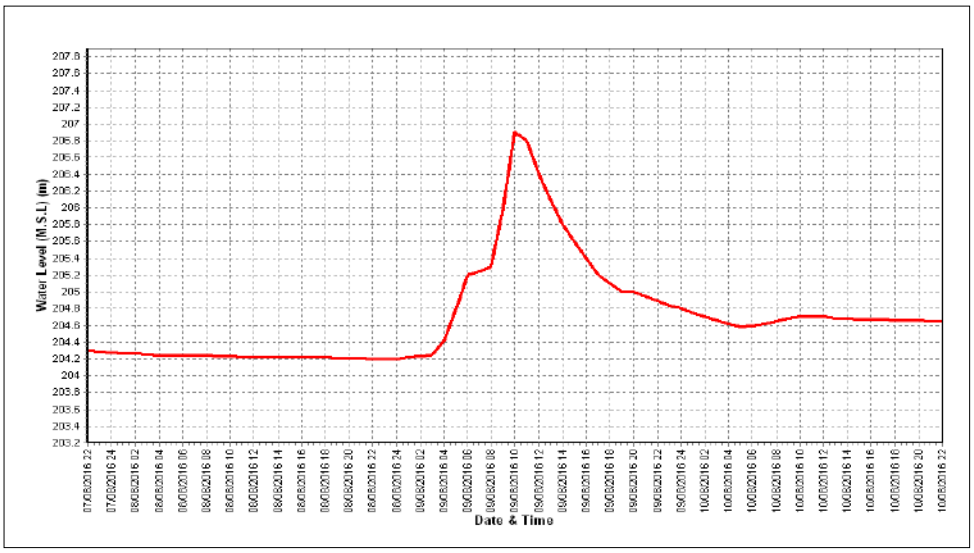


Station Name : Jakham at Dhariawad (01 02 13 004) **Division : Mahi Division, Gandhinagar**
Local River : Jakham **Sub-Division : Mahi Sub Divn., Kadana**

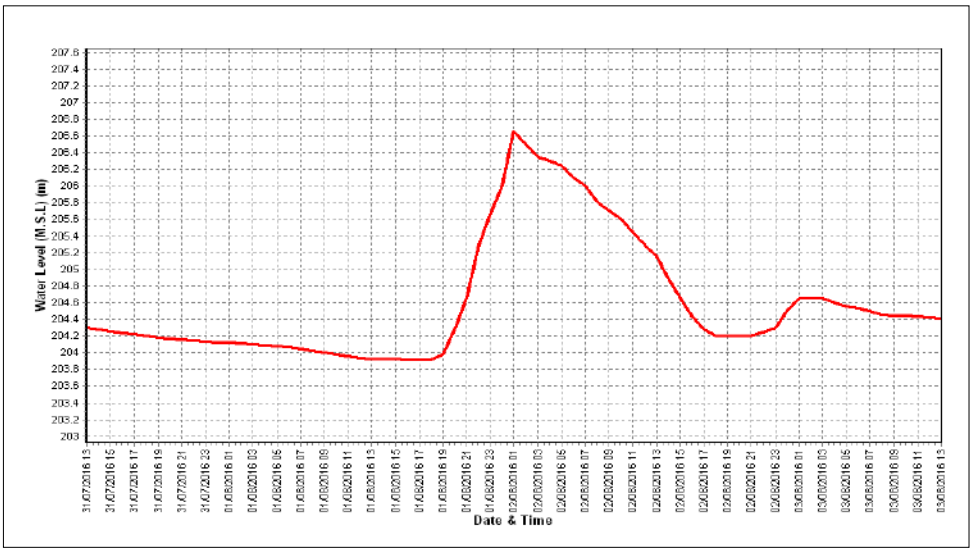
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Mahi at Mataji**	**Code**	:	**01 02 13 001**
State	:	Madhya Pradesh	District		Ratlam
Basin	:	Mahi	Independent River	:	Mahi
Tributary	:	Mahi	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Mahi
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Mahi Sub Divn., Kadana
Drainage Area	:	3880 Sq. Km.	Bank	:	Left
Latitude	:	23°20'57"	Longitude	:	74°43'31"
Zero of Gauge (m)	:	295 (m.s.l) 284 (m.s.l)	01/01/1982 01/01/2004	-	31/12/2003
		Opening Date	Closing Date		
Gauge	:	21/07/1982			
Discharge	:	21/07/1982			
Sediment	:	21/07/1982			
Water Quality	:	21/07/1982			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1982-1983	2688	302.515	16/08/1982	0.000	297.760	07/04/1983
1983-1984	723.8	300.455	11/07/1983	0.000	296.895	28/04/1984
1984-1985	5636	303.895	11/08/1984	0.000	296.970	05/04/1985
1985-1986	165.0	298.800	04/08/1985	0.000	297.015	28/03/1986
1986-1987	6363	305.600	24/07/1986	0.000	297.145	02/03/1987
1987-1988	1080	301.200	25/08/1987	0.000	297.090	30/01/1988
1988-1989	8387	307.000	04/10/1988	0.000	297.100	30/03/1989
1989-1990	1586	297.800	02/07/1989	0.000	297.100	24/01/1990
1990-1991	3436	302.050	23/08/1990	0.000	296.990	27/04/1991
1991-1992	3154	304.800	31/07/1991	0.000	296.730	22/06/1991
1992-1993	475.7	299.800	07/09/1992	0.000	296.940	02/05/1993
1993-1994	1779	305.500	17/07/1993	0.000	296.970	09/06/1993
1994-1995	3453	306.550	02/08/1994	0.000	296.740	03/06/1994
1995-1996	1312	302.425	25/07/1995	0.000	296.990	14/04/1996
1996-1997	10257	306.300	28/07/1996	0.000	296.910	16/04/1997
1997-1998	2210	302.730	31/07/1997	0.000	296.560	01/06/1997
1998-1999	2430	302.150	16/09/1998	0.000	296.680	13/05/1999
1999-2000	284.0	299.230	26/09/1999	0.000	296.990	25/01/2000
2000-2001	134.0	299.050	13/08/2000	0.000	296.870	25/01/2001
2001-2002	166.0	299.220	17/08/2001	0.000	296.525	25/01/2002
2002-2003	414.1	299.750	04/09/2002	0.000	River Dry	13/05/2003
2003-2004	8252	306.300	28/07/2003	0.000	286.440	15/04/2004
2004-2005	1230	290.030	14/08/2004	0.000	286.080	21/05/2005
2005-2006	8075	294.480	28/07/2005	0.000	286.330	01/01/2006
2006-2007	7296	294.190	10/08/2006	0.217	286.610	19/07/2006
2007-2008	8074	294.300	09/07/2007	0.000	285.650	01/06/2007
2008-2009	202.3	288.890	12/09/2008	0.000	285.550	31/05/2009
2009-2010	6579	293.720	23/07/2009	0.000	286.500	20/11/2009
2010-2011	1017	290.460	30/08/2010	0.000	286.630	20/01/2011
2011-2012	1227.3	290.600	10/08/2011	0.000	286.610	10/02/2012
2012-2013	2631.0	292.120	07/09/2012	0.000	286.420	01/06/2012
2013-2014	1720	291.45	02/08/2013	0.000	286.02	01/06/2013
2014-2015	563.3	289.525	09/09/2014	0.000	286.36	01/06/2014
2015-2016	2643	291.225	26/07/2015	0.000	286.670	19/10/2015
2016-2017	671	289.500	27/07/2016	0.000	285.400	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

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	285.400	0.000	285.160	0.000	287.960	227.9	289.500	648.5 #	288.300	298.2	286.860	5.870 *
2	285.390	0.000	285.160	0.000	290.505	608.7	289.000	475.2	289.080	503.6 *	286.850	4.776
3	285.380	0.000	285.200	0.000	288.830	466.4	288.890	426.6	288.535	329.9	286.850	4.776
4	285.370	0.000	288.700	329.6 #	289.890	366.0	288.860	432.9 *	288.503	317.2	286.850	4.775
5	285.360	0.000	288.000	119.0 #	289.430	620.1	288.770	405.1 #	288.794	410.6	286.840	4.597
6	285.350	0.000	287.640	47.33 *	288.950	513.4	288.750	356.4	288.162	287.3	286.840	4.540 *
7	285.340	0.000	287.570	39.85	288.900	405.4 *	287.805	178.6	288.050	249.3	286.838	4.579
8	285.330	0.000	287.525	39.57	288.980	527.6	287.600	144.8	288.184	270.1	286.820	2.583
9	285.310	0.000	287.510	37.85	289.000	538.1	288.000	233.3	288.020	200.2 *	286.800	2.470
10	285.290	0.000	287.510	28.49 *	288.950	425.4 #	287.980	221.2	288.000	242.2	286.790	2.384
11	285.270	0.000	287.540	40.85	289.220	540.1 #	287.980	190.7 *	287.980	190.7 *	286.780	2.275
12	285.260	0.000	289.400	622.9 #	289.150	509.3 #	287.980	221.2	287.840	158.9 *	286.770	0.960 *
13	285.250	0.000	288.800	366.7 #	288.402	185.3	287.970	188.4 *	287.820	174.9	286.760	0.620 *
14	285.230	0.000	288.400	228.6 #	288.260	186.9 *	287.910	211.4	287.720	154.6	286.750	0.330
15	285.220	0.000	288.270	164.7	288.130	151.3 *	287.900	206.7	288.168	272.2	286.740	0.110 *
16	285.210	0.000	288.200	152.7	288.000	123.5	287.908	212.4	288.160	234.6 *	286.740	0.110 *
17	285.200	0.000	288.140	154.0 *	288.120	131.2	287.990	225.0	288.150	263.0	286.730	0.000
18	285.190	0.000	288.050	125.0	287.890	107.6	288.280	265.5 *	288.110	252.2	286.730	0.000
19	285.180	0.000	287.960	114.0	287.830	102.4	288.560	336.9	288.060	209.8 *	286.730	0.000 *
20	285.170	0.000	287.920	100.7 #	288.110	129.8	288.890	430.4	287.980	190.7 *	286.720	0.000 *
21	285.160	0.000	287.890	103.6	291.850	2204 *	288.510	335.0	287.890	192.4	286.710	0.000
22	285.150	0.000	287.860	80.42	289.480	661.3 #	288.560	338.1	287.840	183.9	286.700	0.000 *
23	285.140	0.000	287.830	95.25	289.100	487.7 #	288.530	314.8	287.810	152.3 *	286.690	0.000
24	285.150	0.000	287.810	77.77 *	289.500	671.0 #	288.560	335.9	287.580	105.4 #	286.680	0.000
25	285.160	0.000	288.276	165.5	288.600	294.2 *	288.670	375.0 *	287.550	99.73 #	286.670	0.000
26	285.160	0.000	287.950	111.9	288.120	131.2	288.650	365.9	287.350	28.78	286.660	0.000
27	285.150	0.000	289.500	671.0 #	288.000	121.0	288.670	382.8	287.315	22.84	286.650	0.000
28	285.150	0.000	288.300	168.3	288.400	228.6 *	288.650	346.0	286.950	5.467	286.640	0.000
29	285.160	0.000	288.120	131.2	288.120	131.2	288.462	340.9	286.900	5.104	286.620	0.000
30	285.160	0.000	288.000	121.0	288.080	125.2	288.300	298.0	286.880	7.310 *	286.600	0.000
31			287.950	107.4 *	287.900	109.8			286.870	6.580 *		
Ten-Daily Mean												
I Ten-Daily	285.352	0.000	286.997	64.17	289.139	469.9	288.516	352.3	288.363	310.9	286.834	4.135
II Ten-Daily	285.218	0.000	288.268	207.0	288.311	216.7	288.137	248.9	287.999	210.2	286.745	0.440
III Ten-Daily	285.154	0.000	288.135	166.7	288.832	469.5	288.556	343.2	287.358	73.61	286.662	0.000
Monthly												
Min.	285.140	0.000	285.160	0.000	287.830	102.4	287.600	144.8	286.870	5.104	286.600	0.000
Max.	285.400	0.000	289.500	671.0	291.850	2204	289.500	648.5	289.080	503.6	286.860	5.870
Mean	285.241	0.000	287.811	146.6	288.763	388.1	288.403	314.8	287.889	194.2	286.747	1.525

Annual Runoff in MCM = 2783 Annual Runoff in mm = 717

Peak Observed Discharge = 671.0 cumecs on 27/07/2016 Corres. Water Level :289.5 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :285.4 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 Data for the period 2016 - 2017

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	286.600	0.000	286.560	0.000	286.820	2.857	286.720	0.000	286.550	0.000	286.400	0.000
2	286.580	0.000	286.640	0.000 #	286.820	3.330 *	286.720	0.000	286.500	0.000	286.400	0.000
3	286.570	0.000	286.724	0.000 #	286.810	2.780 *	286.690	0.000	286.500	0.000	286.400	0.000
4	286.570	0.000	286.820	2.597	286.810	2.503	286.650	0.000	286.490	0.000	286.400	0.000
5	286.560	0.000	286.800	2.270 *	286.810	2.780 *	286.640	0.000	286.490	0.000	286.390	0.000
6	286.560	0.000	286.800	2.223	286.810	2.780 *	286.630	0.000	286.480	0.000	286.390	0.000
7	286.560	0.000	286.810	2.295	286.810	2.480	286.620	0.000	286.470	0.000	286.390	0.000
8	286.560	0.000	286.810	2.780 *	286.800	2.386	286.610	0.000	286.470	0.000	286.390	0.000
9	286.520	0.000	286.810	2.780 *	286.850	5.190 *	286.610	0.000	286.470	0.000	286.380	0.000
10	286.510	0.000	286.810	2.780 *	286.840	3.679	286.610	0.000	286.470	0.000	286.380	0.000
11	286.500	0.000	286.810	2.780 *	286.820	3.330 *	286.600	0.000	286.460	0.000	286.380	0.000
12	286.490	0.000	286.820	3.330 *	286.780	1.350 *	286.600	0.000	286.460	0.000	286.380	0.000
13	286.480	0.000	286.820	3.330 *	286.760	2.058	286.600	0.000	286.450	0.000	286.380	0.000
14	286.480	0.000	286.820	3.330 *	286.760	0.620 *	286.600	0.000	286.450	0.000	286.380	0.000
15	286.470	0.000	286.820	3.330 *	286.760	2.144	286.590	0.000	286.450	0.000	286.380	0.000
16	286.470	0.000	286.820	2.587	286.750	0.330 *	286.590	0.000	286.450	0.000	286.380	0.000
17	286.460	0.000	286.830	2.675	286.750	0.330 *	286.580	0.000	286.450	0.000	286.380	0.000
18	286.460	0.000	286.830	2.662	286.750	0.330 *	286.580	0.000	286.440	0.000	286.380	0.000
19	286.460	0.000	286.830	3.920 *	286.750	0.330 *	286.580	0.000	286.440	0.000	286.380	0.000
20	286.460	0.000	286.830	3.920 *	286.750	0.330 *	286.580	0.000	286.430	0.000	286.370	0.000
21	286.470	0.000	286.830	2.655	286.740	0.110 *	286.570	0.000	286.430	0.000	286.370	0.000
22	286.470	0.000	286.820	3.330 *	286.740	0.110 *	286.560	0.000	286.430	0.000	286.370	0.000
23	286.470	0.000	286.820	3.330 *	286.730	0.000	286.560	0.000	286.430	0.000	286.370	0.000
24	286.470	0.000	286.820	3.330 *	286.730	0.000	286.560	0.000	286.420	0.000	286.370	0.000
25	286.470	0.000	286.830	3.920 *	286.730	0.000	286.560	0.000	286.420	0.000	286.370	0.000
26	286.480	0.000	286.830	3.920 *	286.730	0.000	286.560	0.000	286.420	0.000	286.370	0.000
27	286.480	0.000	286.820	2.556	286.730	0.000	286.560	0.000	286.410	0.000	286.370	0.000
28	286.480	0.000	286.820	2.543	286.730	0.000	286.560	0.000	286.410	0.000	286.350	0.000
29	286.480	0.000	286.820	3.330 *			286.560	0.000	286.400	0.000	286.340	0.000
30	286.480	0.000	286.820	3.330 *			286.550	0.000	286.400	0.000	286.330	0.000
31	286.490	0.000	286.820	3.330 *			286.550	0.000			286.320	0.000
Ten-Daily Mean												
I Ten-Daily	286.559	0.000	286.758	1.773	286.818	3.077	286.650	0.000	286.489	0.000	286.392	0.000
II Ten-Daily	286.473	0.000	286.823	3.186	286.763	1.115	286.590	0.000	286.448	0.000	286.379	0.000
III Ten-Daily	286.476	0.000	286.823	3.234	286.732	0.028	286.559	0.000	286.417	0.000	286.357	0.000
Monthly												
Min.	286.460	0.000	286.560	0.000	286.730	0.000	286.550	0.000	286.400	0.000	286.320	0.000
Max.	286.600	0.000	286.830	3.920	286.850	5.190	286.720	0.000	286.550	0.000	286.400	0.000
Mean	286.502	0.000	286.802	2.747	286.774	1.505	286.598	0.000	286.451	0.000	286.375	0.000

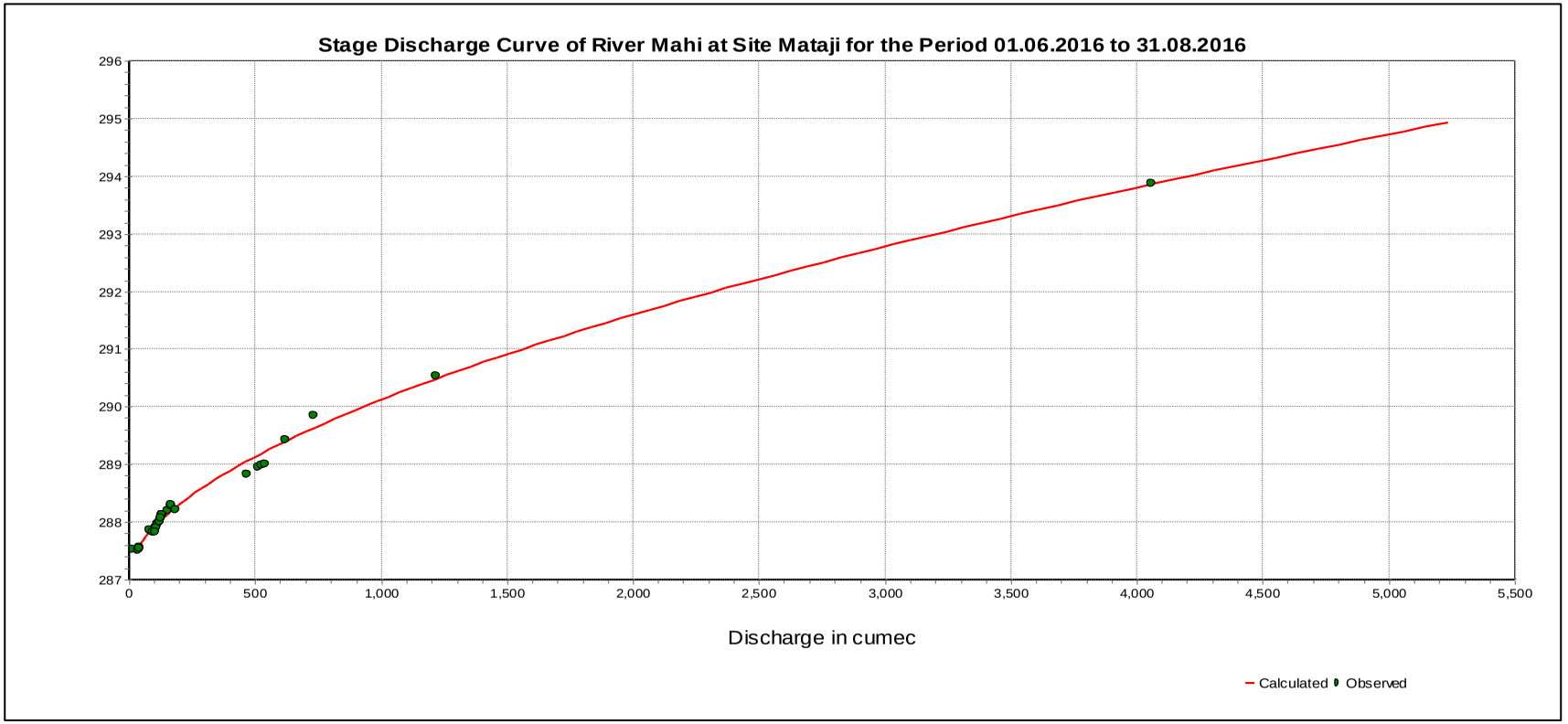
Peak Computed Discharge = 2204 cumecs on 21/08/2016 Corres. Water Level :291.85 m

Lowest Computed Discharge = 0.000 cumecs on 19/11/2016 Corres. Water Level :286.73 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)

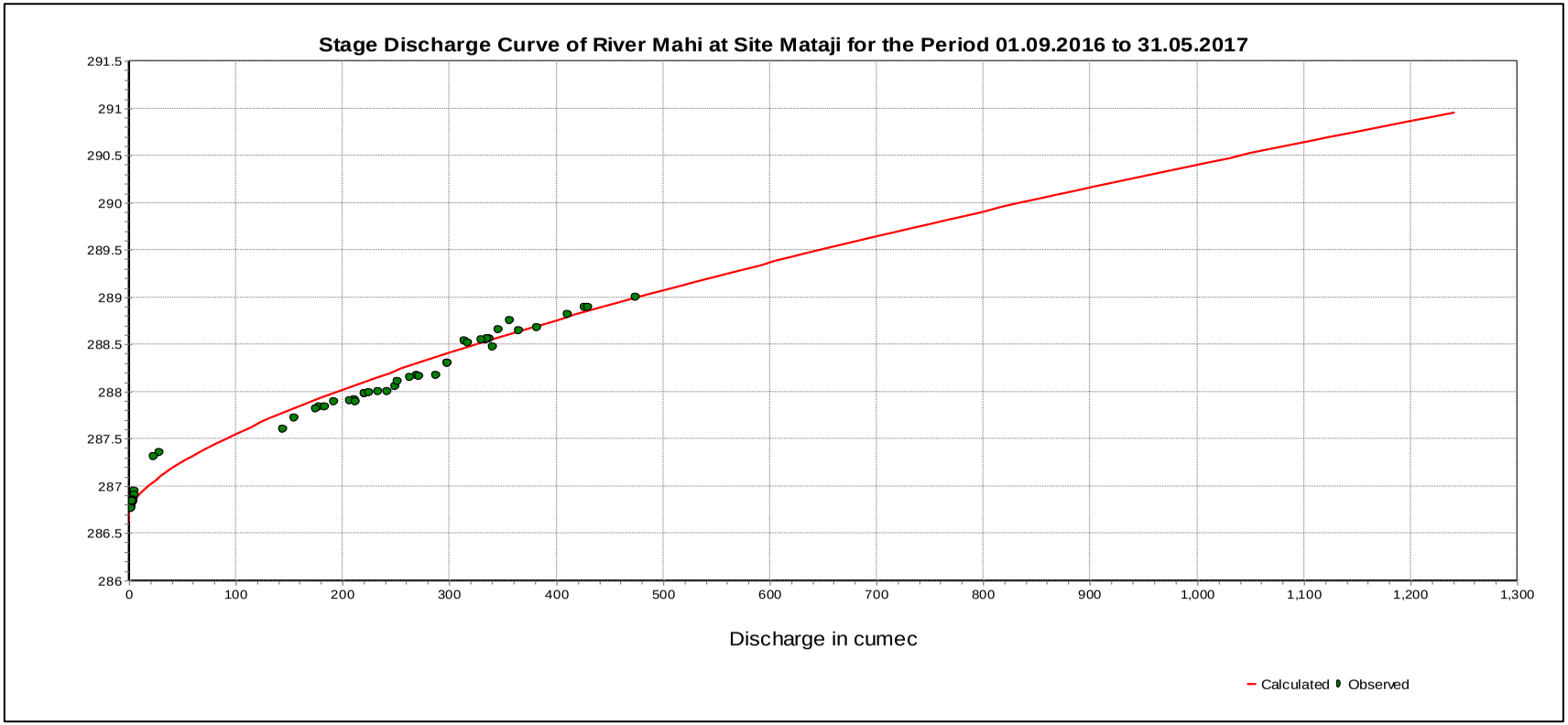
Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
287.45	295	-287.13	1.726	151.325



Procedure - Standard

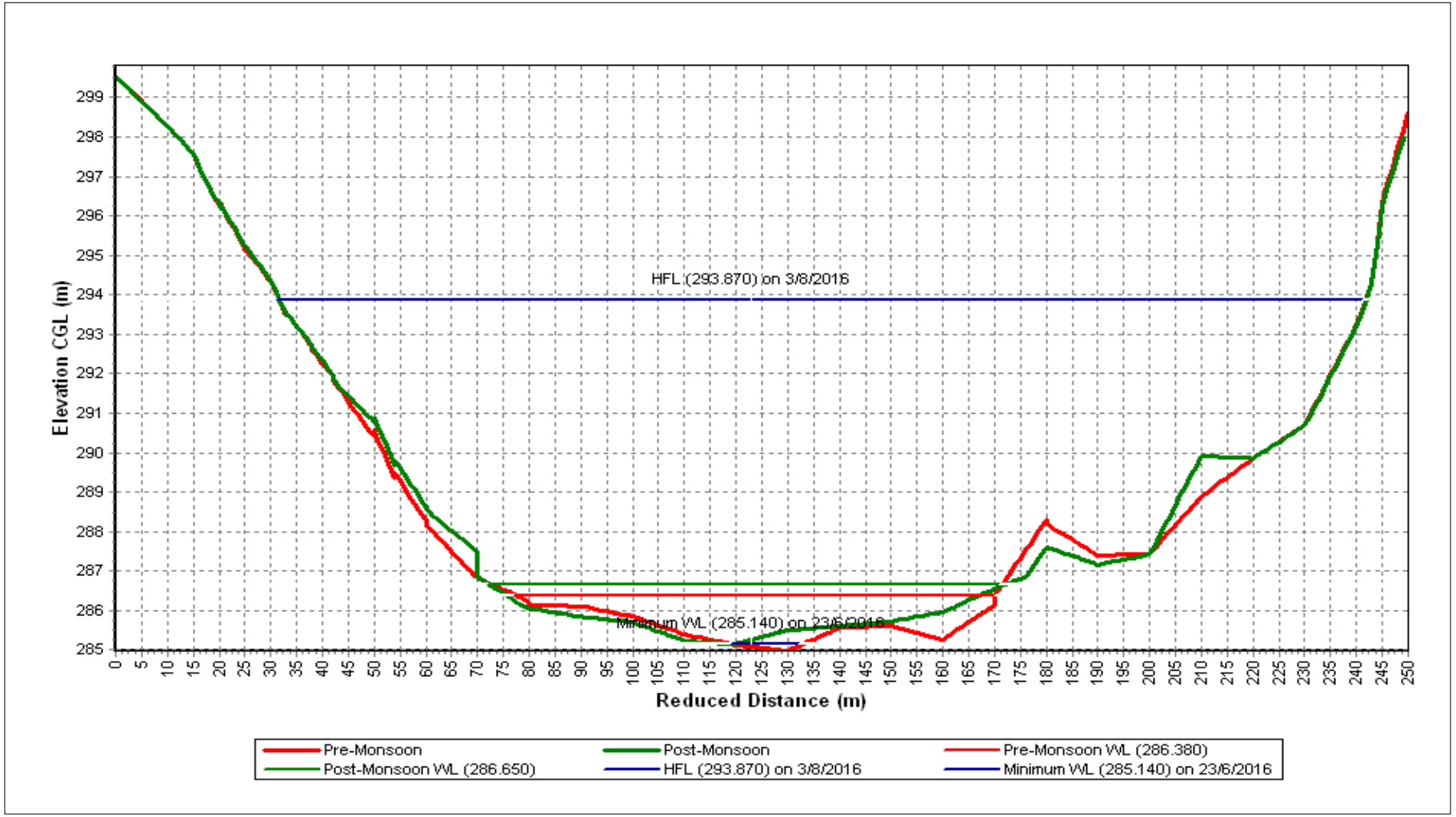
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
286.62	291	-286.73	1.538	135.323

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

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**



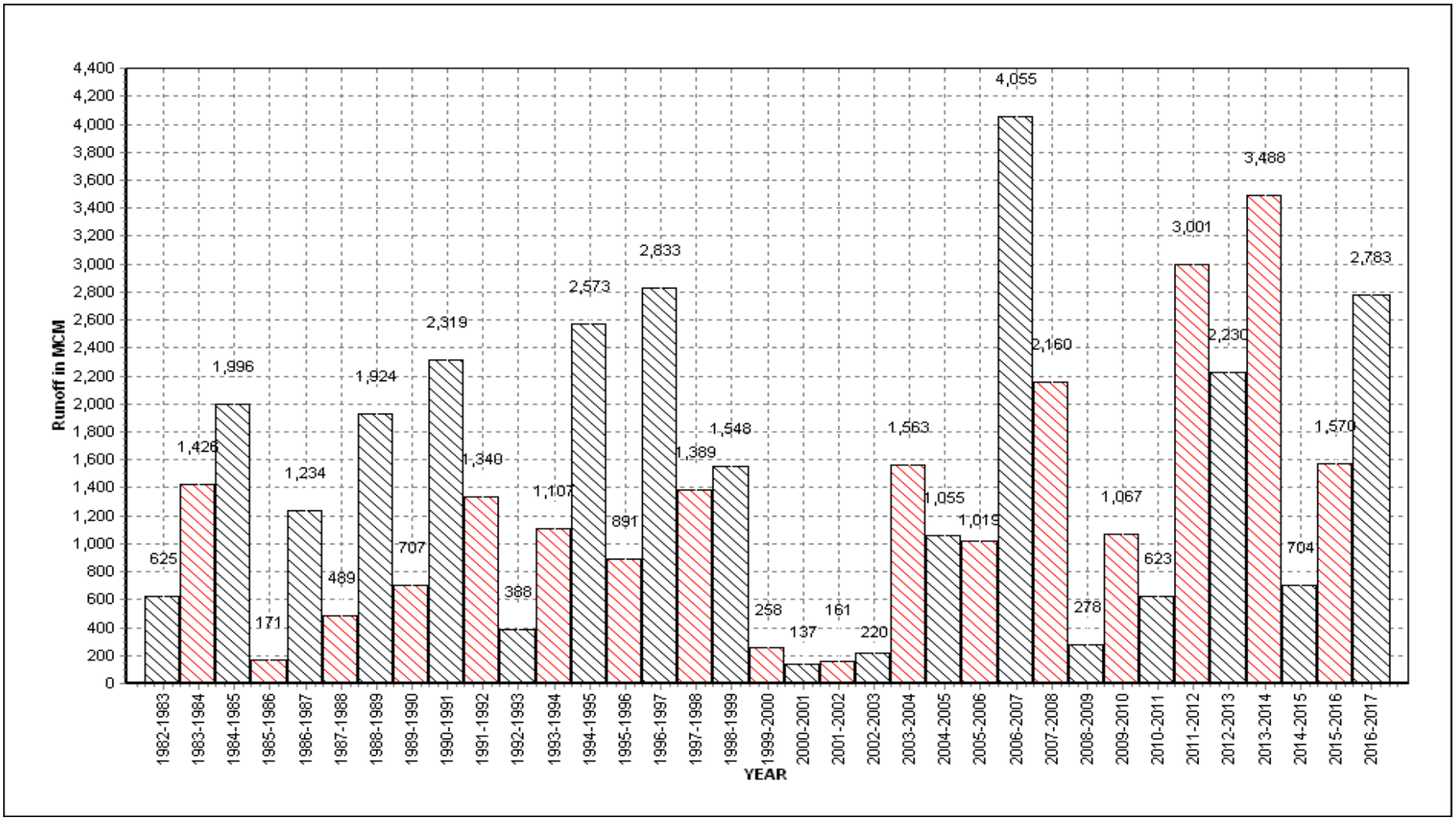
Historical flood level - 298.32 m on 06.09.2006 at 1800 hrs

Note: HFL marked on graph denotes Maxiumun Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1982 - 2017

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

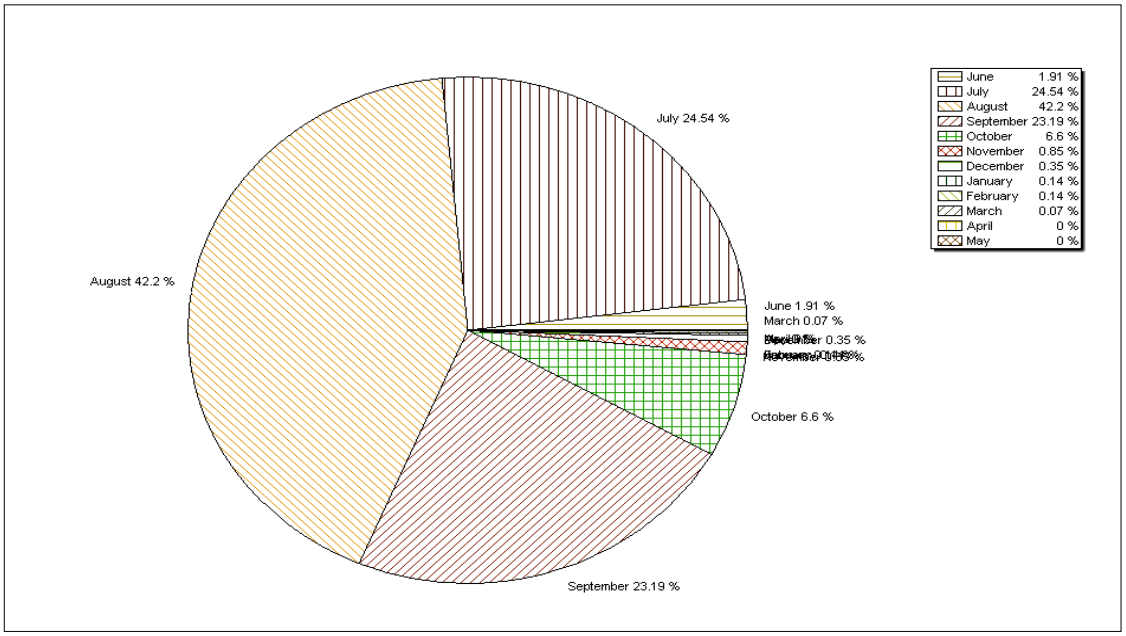


Note: Missing values have not been considered while arriving at Annual Runoff

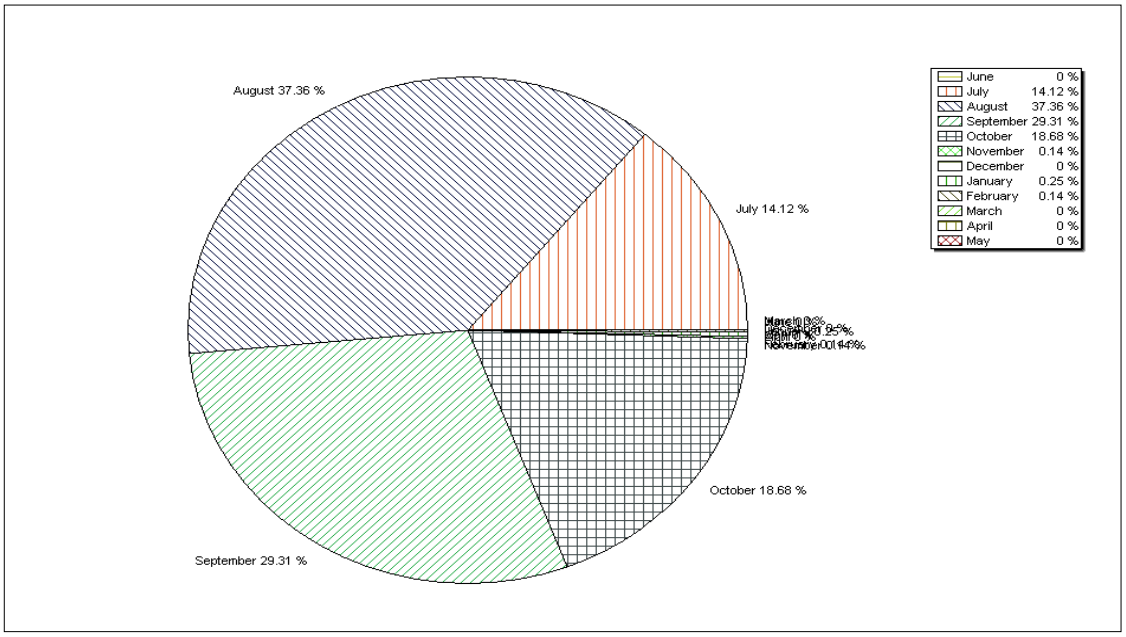
Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

Monthly Average Runoff based on period : 1982-2016



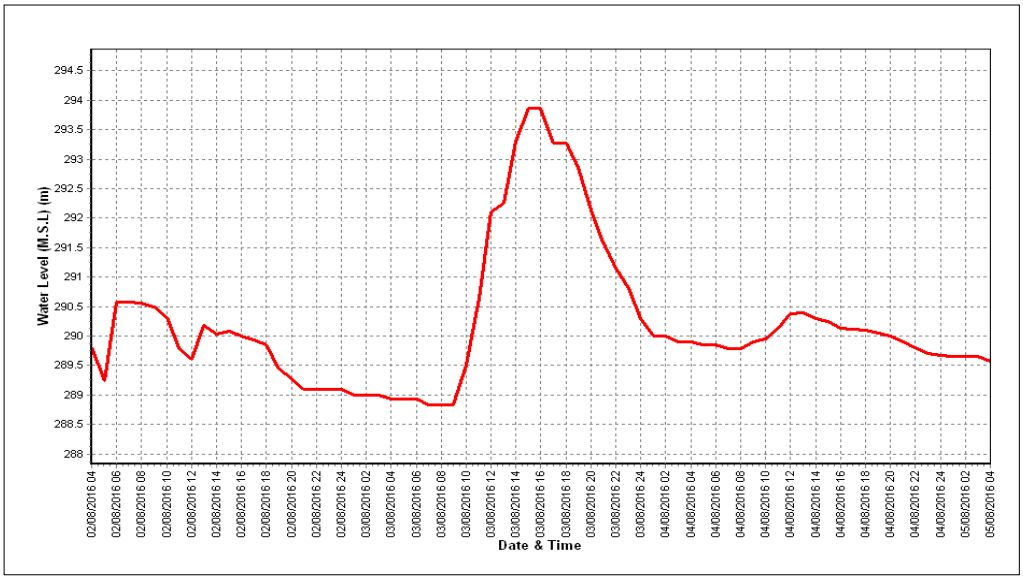
Monthly Runoff for the Year : 2016-2017



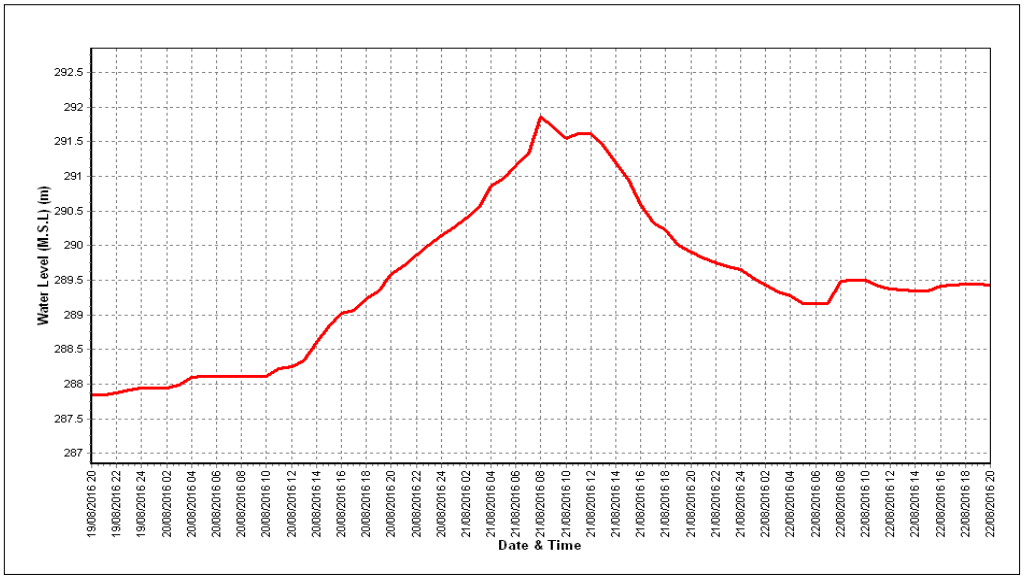
Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

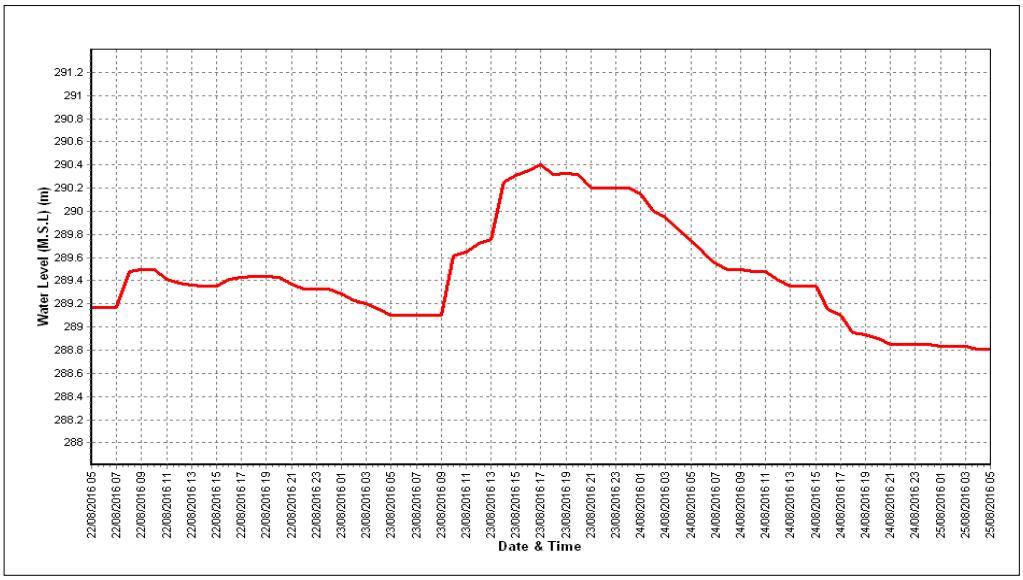
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Sabarmati at Voutha**	**Code**	**:**	**01 02 12 013**
State	:	Gujarat	District	:	Ahmedabad
Basin	:	Sabarmati	Independent River	:	Sabarmati
Tributary	:	Sabarmati	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Sabarmati
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	19636 Sq. Km.	Bank	:	Left
Latitude	:	22°38'59"N	Longitude	:	72°32'08"E
Zero of Gauge (m)					
	:	12 (m.s.l)	01/06/1999	-	
		Opening Date	Closing Date		
Gauge	:	05/08/1999			
Discharge	:	24/06/2000			
Sediment	:	---			
Water Quality	:	01/01/2000			

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	168.0	15.198	09/08/2001	0.000	River Dry	10/10/2001
2002-2003	145.3	15.048	06/09/2002	0.000	12.970	18/05/2003
2003-2004	2220	19.025	25/08/2003	0.000	13.100	01/06/2003
2004-2005	1205	17.810	07/08/2004	0.000	13.480	30/06/2004
2005-2006	3141	19.000	01/07/2005	3.857	13.250	07/06/2005
2006-2007	3351	19.865	09/08/2006	3.565	13.510	15/07/2006
2007-2008	4958	20.660	10./07/2007	6.546	13.800	18/06/2007
2008-2009	704.2	17.170	13/08/2008	9.093	13.880	10/07/2008
2009-2010	972.5	16.500	24/07/2009	8.605	13.650	23/11/2009
2010-2011	880.1	16.550	09/08/2010	5.275	13.760	21/07/2010
2011-2012	1744.1	18.140	13/09/2011	6.296	13.710	24/06/2011
2012-2013	2223.0	19.145	08/09/2012	7.106	13.710	19/11/2012
2013-2014	1269	17.380	04/08/2013	4.500	13.360	19/09/2013
2014-2015	1201	17.745	10/09/2014	8.339	13.620	04/04/2015
2015-2016	3137	20.320	31/07/2015	10.11	13.750	05/03/2016
2016-2017	1499	18.500	25/08/2016	8.458	13.950	23/05/2017

Stage-Discharge Data for the period 2016 - 2017

Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	13.790	38.03 #	13.780	37.90	13.960	48.73 #	15.930	277.5 *	14.110	29.98	13.998	25.85
2	13.780	36.75	13.780	38.29	13.920	48.35	16.451	462.1	14.247	40.44	13.960	22.26
3	13.770	36.16	13.780	37.41 *	13.930	46.81 #	15.917	270.6	14.421	53.97	13.953	17.03
4	13.775	36.64	13.780	38.32	14.010	26.62	16.480	434.5 *	14.319	47.35	14.030	27.59
5	13.770	36.79 *	13.770	36.12	14.290	35.70	15.789	173.1	15.150	154.7	14.040	20.27
6	13.780	35.55	13.780	38.01	15.100	82.34	15.580	274.8	15.475	183.9	13.980	19.94 *
7	13.770	35.86	13.740	37.41 #	14.640	64.99 *	15.221	165.6	16.314	392.8	13.930	22.15
8	13.770	36.79 #	13.820	39.03	15.120	171.6	15.149	143.1	16.308	330.2	13.950	15.79
9	13.755	36.62	13.780	37.56	15.440	110.6	15.241	187.8	15.855	188.0	13.850	19.75
10	13.745	35.93	13.770	36.79 *	15.300	97.34	14.519	107.0	16.090	303.7	13.958	28.06
11	13.760	35.43	13.770	36.79 #	15.850	258.4 #	14.540	55.91 *	14.978	86.13	13.950	21.26
12	13.760	36.18 *	13.770	36.22	16.063	216.5	14.200	43.20	14.935	116.9	13.950	17.92
13	13.750	35.57 #	13.880	42.43	15.510	131.7	14.100	33.58	14.728	98.16	13.930	17.81 *
14	13.760	36.40	14.370	75.64	15.540	192.3 *	14.060	28.26	14.748	90.47	13.930	21.53
15	13.745	36.42	14.080	57.46	14.570	51.67	14.010	34.48	14.240	64.41	13.920	21.69
16	13.740	34.96 #	13.960	50.14	14.290	83.02	14.022	33.87	14.190	30.70 *	13.910	15.79
17	13.740	35.51	13.960	48.73 *	14.690	69.87 #	14.040	27.32	14.120	39.08	13.890	15.47
18	13.740	35.08	13.970	49.18	14.680	66.38	14.380	43.17 *	14.120	48.17	13.922	13.90
19	13.740	34.96 *	13.880	40.88	14.250	34.34 #	14.440	54.00	13.990	35.18	13.940	12.47
20	13.750	35.24	13.870	42.23	14.410	53.03	14.757	65.76	14.070	41.97	13.940	18.23 *
21	13.760	35.57 #	13.850	43.67	14.630	64.04 *	14.641	56.28	14.080	40.09	13.940	12.17
22	13.790	36.50	13.830	37.86	14.680	71.32	14.919	89.31	14.060	38.42	13.990	15.53
23	13.770	36.29	13.820	40.30	15.390	234.7	14.540	69.68	14.150	31.74	13.984	15.58
24	13.770	37.91	13.820	39.89 *	16.460	427.9 #	14.170	54.92	14.080	34.14	13.940	15.23
25	13.770	38.75	13.810	38.21	18.500	1499	14.925	109.3	14.000	32.25	13.960	13.56
26	13.760	36.18 *	13.800	39.26	16.900	727.9 #	14.370	60.31	14.040	35.29	13.960	17.96
27	13.780	38.60	13.800	36.20	16.120	326.6 #	14.170	36.81	14.030	41.04	13.960	19.07 *
28	13.780	36.98	13.820	42.38	16.050	307.9 *	14.231	46.16	14.020	29.54	13.940	15.03
29	13.775	37.52	13.910	44.88	16.150	334.9 #	14.110	31.60	14.010	29.93	13.940	17.27
30	13.780	38.14	13.860	43.01	15.906	188.5	14.100	29.85	14.020	21.76 *	13.940	17.08
31			13.860		16.580	418.9			14.020	32.97		
Ten-Daily Mean												
I Ten-Daily	13.771	36.51	13.778	37.68	14.571	73.31	15.628	249.6	15.229	172.5	13.965	21.87
II Ten-Daily	13.748	35.57	13.951	47.97	14.985	115.7	14.255	41.96	14.412	65.12	13.928	17.61
III Ten-Daily	13.774	37.24	13.835	40.56	16.124	418.4	14.418	58.42	14.046	33.38	13.955	15.85
Monthly												
Min.	13.740	34.96	13.740	36.12	13.920	26.62	14.010	27.32	13.990	21.76	13.850	12.17
Max.	13.790	38.75	14.370	75.64	18.500	1499	16.480	462.1	16.314	392.8	14.040	28.06
Mean	13.764	36.44	13.854	42.07	15.256	209.4	14.767	116.7	14.546	88.5	13.949	18.44

Annual Runoff in MCM = 1621 Annual Runoff in mm = 83

Peak Observed Discharge = 1499 cumecs on 25/08/2016 Corres. Water Level :18.5 m

Lowest Observed Discharge = 8.458 cumecs on 23/05/2017 Corres. Water Level :13.95 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 Data for the period 2016 - 2017

Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	13.960	18.45	13.920	17.40 *	13.930	18.25	13.900	19.55	13.900	19.61	13.900	20.91
2	13.940	15.56	13.920	17.40 *	13.900	19.94	13.900	20.55	13.910	17.00 *	13.900	19.18
3	13.930	14.17	13.930	11.30	13.940	20.05	13.890	20.02	13.880	16.58	13.900	18.17
4	13.940	18.23 *	13.920	14.22	13.930	14.83	13.890	20.25	13.880	17.22	13.900	19.97
5	13.950	17.63	13.910	14.08	13.940	18.23 *	13.900	16.61 *	13.880	18.75	13.900	20.09
6	13.980	20.14	13.930	12.04	13.900	15.92	14.080	20.57	13.880	16.47	13.900	18.79
7	13.990	17.69	13.920	17.40 *	13.910	16.69	13.990	19.33	13.870	18.46	13.900	16.61 *
8	13.980	19.19	13.920	17.40 *	13.920	18.10	13.970	17.69	13.870	17.96	13.900	19.49
9	13.980	18.26	13.940	16.10	13.900	17.41	13.980	17.43	13.870	15.46 *	13.910	21.47
10	13.990	18.01	13.940	16.15	13.900	18.61	13.890	16.15	13.870	17.81	13.900	16.61 *
11	14.000	20.84 *	13.940	17.46	13.900	16.51	13.900	18.50	13.850	17.78	13.880	17.15
12	13.990	20.39 *	13.930	14.69	13.900	16.61 *	13.900	16.61 *	13.830	19.72	13.880	19.19
13	13.980	16.60	13.930	16.08	13.890	16.88	13.880	15.83 *	13.880	21.28	13.870	20.65
14	13.970	16.59	13.940	18.23 *	13.890	17.06	13.870	17.90	13.880	15.83 *	13.870	15.46 *
15	13.950	14.24	13.930	17.81 *	13.890	16.80	13.850	15.97	13.900	19.84	13.870	18.08
16	13.950	10.82	13.950	14.81	13.880	20.45	13.860	15.48	13.900	16.61 *	13.870	17.18
17	13.940	13.01	13.920	20.84	13.910	19.20	13.890	20.52	13.900	19.94	13.880	8.544
18	13.930	17.81 *	13.940	17.15	13.900	19.64	13.900	18.91	13.880	18.50	13.880	9.132
19	13.910	15.00	13.920	19.59	13.890	16.22 *	13.880	15.83 *	13.880	17.74	13.880	9.061
20	13.900	13.16	13.940	16.06	13.910	18.09	13.890	22.42	13.860	17.76	13.880	9.446
21	13.910	13.76	13.930	15.68	13.920	19.00	13.900	19.70	13.870	18.36	13.880	15.83 *
22	13.910	13.36	13.920	17.40 *	13.920	19.34	13.900	18.99	13.880	18.37	13.940	10.67
23	13.920	17.66	13.930	16.35	13.900	19.61	13.900	19.10	13.880	15.83 *	13.950	8.458
24	13.910	15.31	13.940	14.62	13.890	16.22 *	13.910	20.94	13.880	21.35	13.940	10.73
25	13.910	17.00 *	13.920	17.34	13.900	20.25	13.910	19.43	13.880	20.45	13.930	9.886
26	13.920	15.09	13.910	17.00 *	13.890	16.22 *	13.920	17.40 *	13.880	17.90	13.920	10.16
27	13.910	17.14	13.910	14.89	13.890	21.85	13.920	20.19	13.900	19.84	13.920	11.86
28	13.940	17.86	13.910	16.81	13.900	21.51	13.920	21.53	13.900	19.82	13.920	17.40 *
29	13.920	15.97	13.900	16.61 *			13.900	21.82	13.900	20.09	13.940	10.45
30	13.920	14.31	13.930	15.18			13.900	15.88	13.900	16.61 *	13.930	17.81 *
31	13.930	16.17	13.920	13.38			13.900	19.78			13.920	10.55
Ten-Daily Mean												
I Ten-Daily	13.964	17.73	13.925	15.35	13.917	17.80	13.939	18.81	13.881	17.53	13.901	19.13
II Ten-Daily	13.952	15.85	13.934	17.27	13.896	17.74	13.882	17.80	13.876	18.50	13.876	14.39
III Ten-Daily	13.918	15.78	13.920	15.93	13.901	19.25	13.907	19.52	13.887	18.86	13.926	12.16
Monthly												
Min.	13.900	10.82	13.900	11.30	13.880	14.83	13.850	15.48	13.830	15.46	13.870	8.458
Max.	14.000	20.84	13.950	20.84	13.940	21.85	14.080	22.42	13.910	21.35	13.950	21.47
Mean	13.944	16.43	13.926	16.18	13.905	18.19	13.909	18.74	13.881	18.3	13.902	15.13

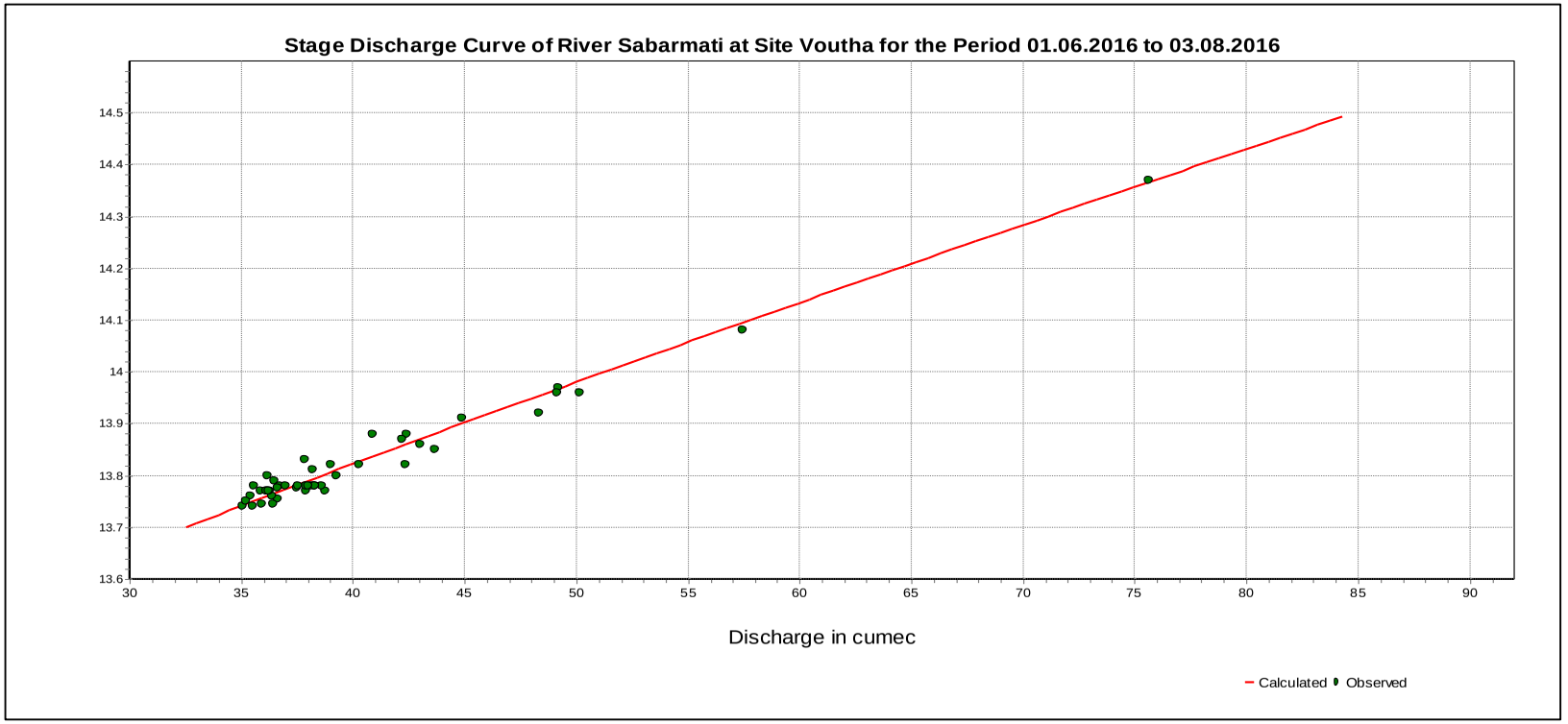
Peak Computed Discharge = 434.5 cumecs on 04/09/2016 Corres. Water Level :16.48 m

Lowest Computed Discharge = 15.46 cumecs on 09/04/2017 Corres. Water Level :13.87 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



Procedure - Standard

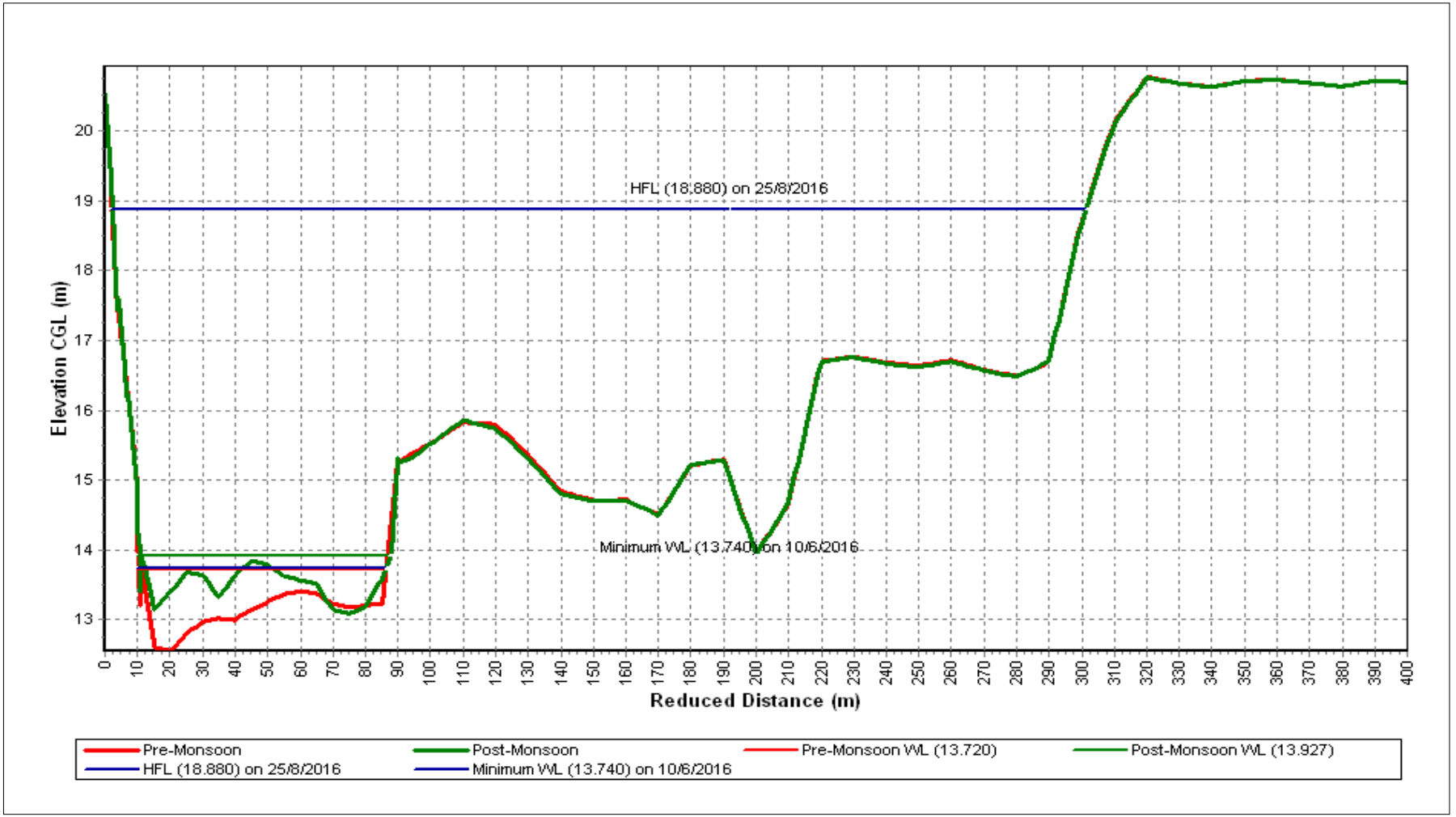
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
13.7	14.5	-13.07	1.17	55.848

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

Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



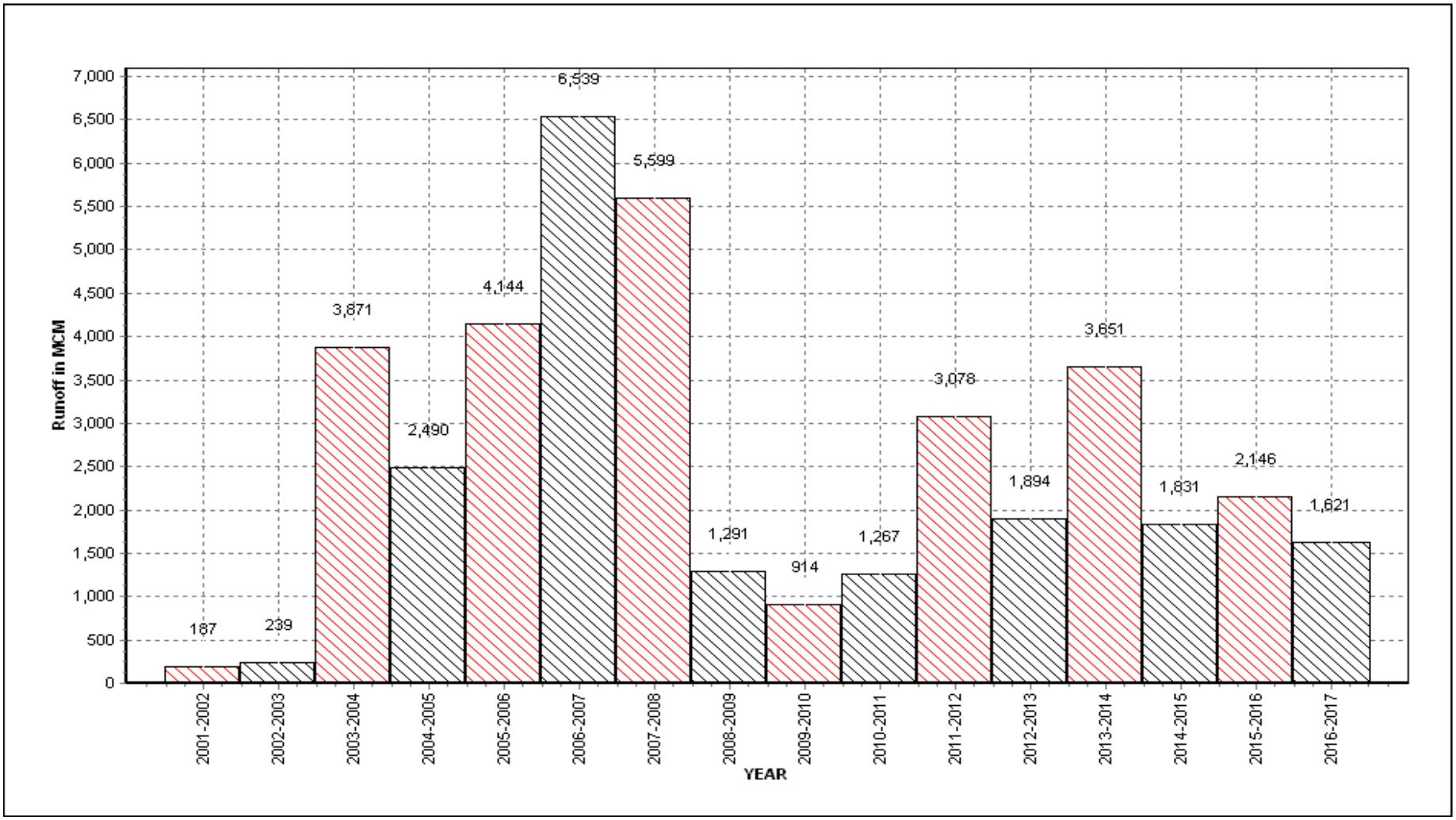
Historic Flood Level-21.090m on 20.08.2006 at 1700 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 2001 - 2017

Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

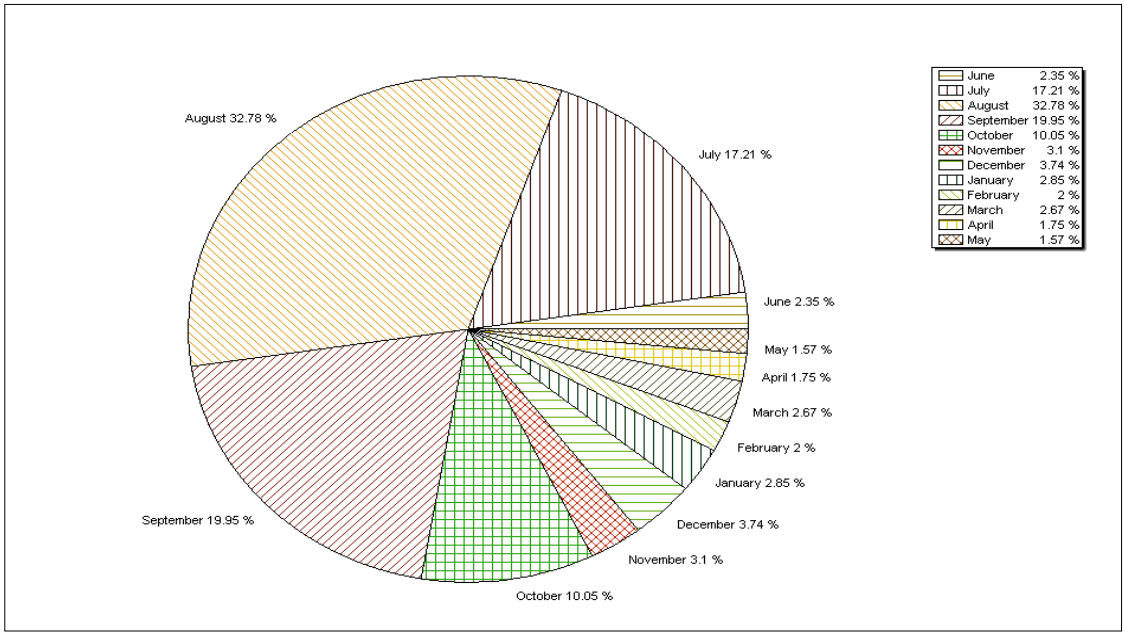


Note: Missing values have not been considered while arriving at Annual Runoff

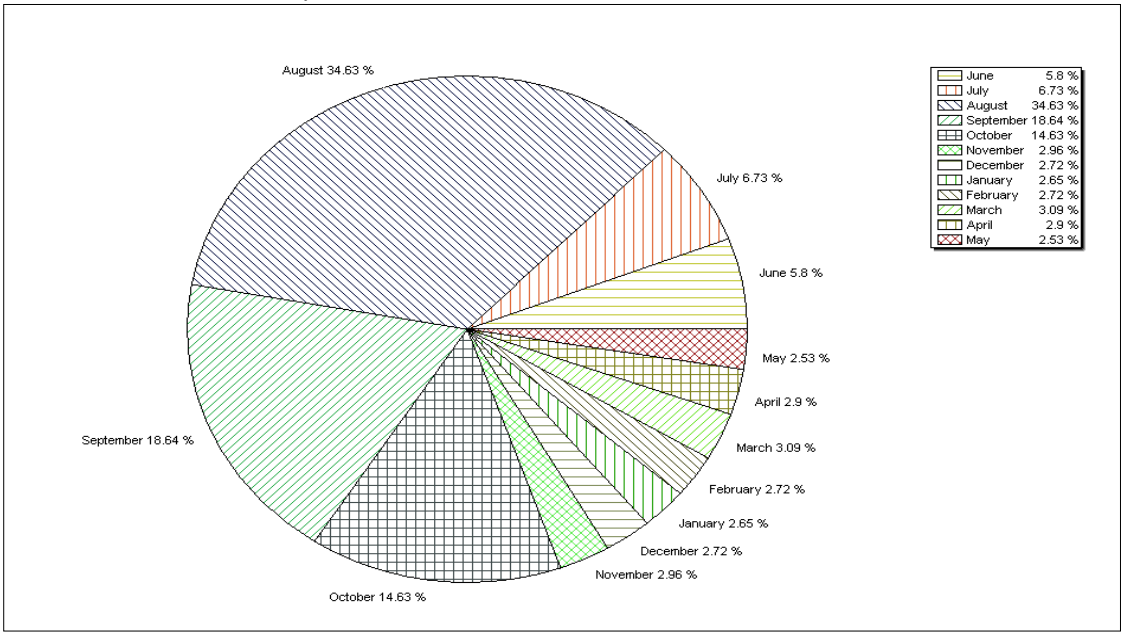
Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 2001-2016



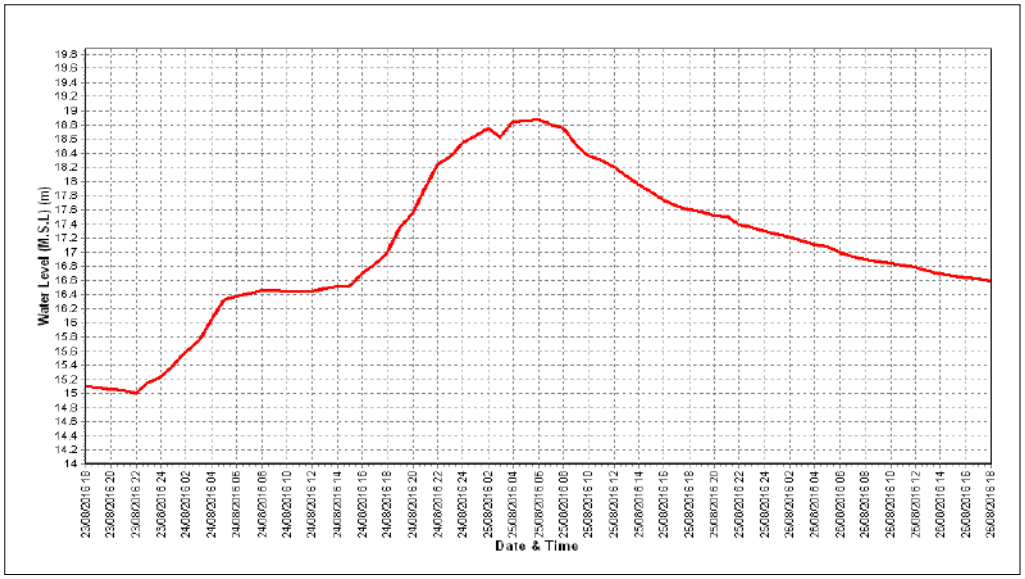
Monthly Runoff for the Year : 2016-2017



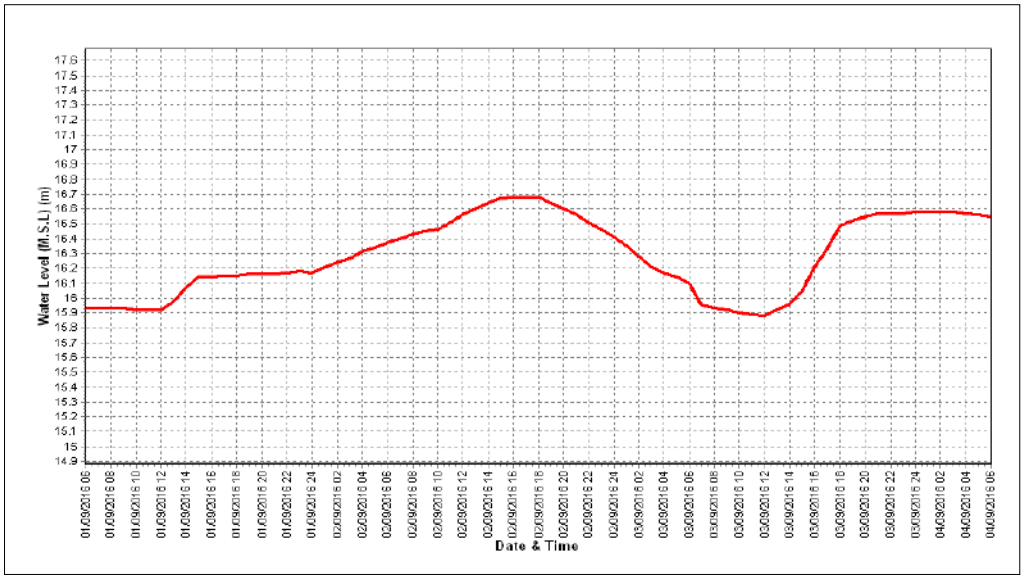
Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

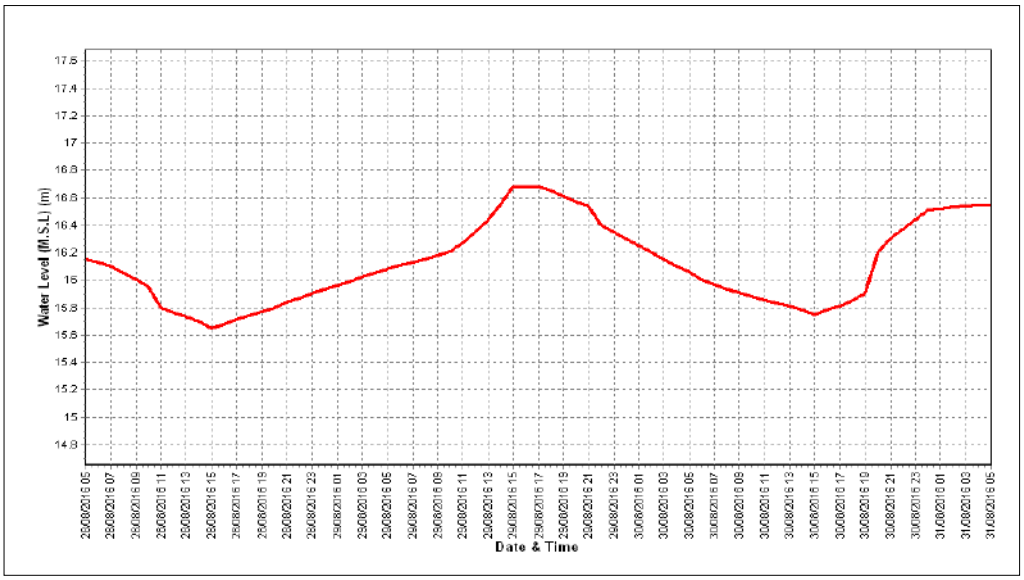
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-17

Site	:	**Watrak at Kheda**	**Code**	:	**01 02 12 012**
State	:	Gujarat	District		Kheda
Basin	:	Sabarmati	Independent River	:	Sabarmati
Tributary	:	Watrak	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Watrak
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	7550 Sq. Km.	Bank	:	Right
Latitude	:	22°44'45"N	Longitude	:	72°40'49"E
Zero of Gauge (m)	:	19.5 (m.s.l)	29/03/1985	-	31/05/1989
		19.75 (m.s.l)	01/06/1989	-	31/05/1994
		19 (m.s.l)	01/06/1994	-	
		Opening Date	Closing Date		
Gauge	:	29/03/1985			
Discharge	:	10/07/1989			
Sediment	:	---			
Water Quality	:	---			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1989-1990	239.7	22.450	21/08/1989	0.000	River Dry	25/01/1990
1990-1991	1626	28.200	25/08/1990	0.000	River Dry	26/01/1991
1991-1992	707.9	23.475	01/08/1991	0.000	River Dry	26/01/1992
1992-1993	57.09	20.830	08/09/1992	0.000	River Dry	25/01/1993
1993-1994	845.5	24.000	18/07/1993	0.000	River Dry	08/11/1993
1994-1995	1617	25.015	09/09/1994	0.000	River Dry	25/01/1995
1995-1996	31.50	20.100	31/07/1995	0.000	River Dry	27/01/1996
1996-1997	310.3	22.175	29/07/1996	0.000	River Dry	25/01/1997
1997-1998	2380	25.950	28/07/1997	0.000	River Dry	25/01/1998
1998-1999	1677	24.100	18/09/1998	0.000	River Dry	12/03/1999
1999-2000	154.2	21.480	21/07/1999	0.000	River Dry	27/01/2000
2000-2001	100.2	21.195	15/07/2000	0.000	River Dry	04/12/2000
2001-2002	0.000	19.230	04/10/2001	0.000	River Dry	25/01/2002
2002-2003	0.000	19.460	21/09/2002	0.000	River Dry	25/01/2003
2003-2004	324.6	22.985	25/08/2003	0.000	River Dry	26/01/2004
2004-2005	182.2	22.220	07/08/2004	0.000	River Dry	29/03/2005
2005-2006	872.0	26.825	07/07/2005	0.000	River Dry	01/06/2005
2006-2007	4508	25.326	12/08/2006	0.000	River Dry	01/06/2006
2007-2008	1682	26.000	10/07/2007	0.000	River Dry	01/06/2007
2008-2009	278.6	22.370	13/08/2008	0.000	19.000	01/11/2008
2009-2010	270.1	21.700	23/07/2009	0.000	19.010	01/12/2009
2010-2011	163.7	21.070	09/08/2010	0.000	19.650	01/06/2010
2011-2012	232.7	21.110	13/09/2011	9.412	19.570	05/10/2011
2012-2013	849.3	24.200	08/09/2012	0.000	18.840	01/06/2012
2013-2014	261.4	21.63	30/09/2013	0.000	River dry	01/06/2013
2014-2015	286	22.27	10/09/2014	0.000	18.4	01/06/2014
2015-2016	272.1	22.14	30/07/2015	0.000	18.35	05/09/2015
2016-2017	295.8	21.55	25/08/2016	0.000	18.06	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Watrak at Kheda (01 02 12 012) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	18.060	0.000	18.060	0.000	18.200	0.310 *	19.960	59.21	18.380	1.587	18.360	0.756
2	18.060	0.000	18.060	0.000	18.300	0.790 *	20.050	69.09	18.370	1.255	18.360	0.710
3	18.060	0.000	18.060	0.000	18.330	0.980 *	20.030	67.51	18.390	1.441	18.350	0.680
4	18.060	0.000	18.060	0.000	18.430	1.830 *	19.681	2.733	18.650	2.733	18.350	0.670
5	18.060	0.000	18.060	0.000	18.730	6.440 *	19.600	48.87	18.788	3.700	18.350	0.644
6	18.060	0.000	18.060	0.000	18.670	5.240 *	19.570	48.72	19.398	27.86	18.340	0.000 *
7	18.060	0.000	18.060	0.000	18.710	6.020 *	19.490	45.09	20.108	68.12	18.300	0.626
8	18.060	0.000	18.080	0.000	18.700	5.820 *	19.670	53.82	20.085	64.16	18.290	0.617
9	18.060	0.000	18.100	0.070 *	18.720	6.230 *	19.570	48.45	19.675	45.17	18.290	0.597
10	18.060	0.000	18.100	0.070 *	18.890	10.37 *	19.050	36.87	19.080	22.60	18.280	0.551
11	18.060	0.000	18.090	0.060 *	20.810	175.9 #	19.150	19.26 #	18.940	17.76	18.278	0.544
12	18.060	0.000	18.090	0.060 *	20.605	107.1	18.730	6.707	18.830	17.13	18.260	0.479
13	18.060	0.000	18.090	0.060 *	20.190	84.84	18.630	6.179	19.030	22.64	18.240	0.470 *
14	18.060	0.000	18.140	0.140 *	19.760	54.18 *	18.540	4.197	18.810	8.260 #	18.250	0.520 *
15	18.060	0.000	18.240	0.470 *	19.390	30.50 #	18.470	1.956	18.640	3.941	18.270	0.518
16	18.060	0.000	18.190	0.280 *	18.940	11.83 #	18.480	1.963	18.560	2.711	18.250	0.469
17	18.060	0.000	18.180	0.250 *	19.370	29.45 #	18.430	1.515	18.500	2.437	18.230	0.380
18	18.060	0.000	18.180	0.250 *	19.320	26.91 #	18.400	1.540 *	18.510	2.618	18.220	0.367
19	18.060	0.000	18.170	0.220 *	19.130	18.46 #	19.080	31.47	18.480	2.243	18.200	0.353
20	18.060	0.000	18.170	0.220 *	19.490	43.81	18.950	23.48	18.470	1.744	18.200	0.310 *
21	18.060	0.000	18.160	0.190 *	19.490	36.12 *	18.810	16.77	18.450	1.573	18.190	0.280 #
22	18.060	0.000	18.160	0.190 *	19.490	44.44	18.660	5.050 #	18.410	1.358	18.242	0.903
23	18.060	0.000	18.160	0.190 *	19.490	46.13	18.440	1.839	18.400	1.109	18.250	0.916
24	18.060	0.000	18.150	0.170 *	19.730	59.56	19.560	45.02	18.390	1.110	18.260	0.940
25	18.060	0.000	18.150	0.170 *	21.550	295.8	19.370	40.84	18.390	1.030	18.272	0.995
26	18.060	0.000	18.140	0.140 *	20.570	114.2	18.720	7.080	18.380	1.011	18.280	0.998
27	18.060	0.000	18.130	0.120 *	20.590	114.6	18.820	8.510 #	18.380	0.881	18.260	0.570 *
28	18.060	0.000	18.130	0.120 *	20.100	83.36 *	18.710	4.135	18.380	0.950	18.260	0.956
29	18.060	0.000	18.130	0.120 *	20.490	86.75	18.540	3.485	18.380	0.978	18.304	1.060
30	18.060	0.000	18.180	0.250 *	20.240	83.75	18.420	2.098	18.370	0.796	18.300	1.073
31			18.180	0.250 *	20.220	67.00			18.370	0.761		
Ten-Daily Mean												
I Ten-Daily	18.060	0.000	18.070	0.014	18.568	4.403	19.667	48.04	19.092	23.86	18.327	0.585
II Ten-Daily	18.060	0.000	18.154	0.201	19.701	58.30	18.686	9.827	18.677	8.148	18.240	0.441
III Ten-Daily	18.060	0.000	18.152	0.174	20.178	93.79	18.805	13.48	18.391	1.051	18.262	0.869
Monthly												
Min.	18.060	0.000	18.060	0.000	18.200	0.310	18.400	1.515	18.370	0.761	18.190	0.000
Max.	18.060	0.000	18.240	0.470	21.550	295.8	20.050	69.09	20.108	68.12	18.360	1.073
Mean	18.060	0.000	18.126	0.131	19.505	53.51	19.053	23.78	18.709	10.7	18.276	0.632

Annual Runoff in MCM = 236 Annual Runoff in mm = 31

Peak Observed Discharge = 295.8 cumecs on 25/08/2016 Corres. Water Level :21.55 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016 Corres. Water Level :18.06 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 Data for the period 2016 - 2017

Station Name : Watrak at Kheda (01 02 12 012) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	18.270	0.968	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
2	18.210	0.340 #	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
3	18.200	0.310 #	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
4	18.270	0.620 *	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
5	18.288	1.019	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
6	18.260	0.873	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
7	18.290	1.006	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
8	18.258	0.803	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
9	18.300	1.071	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
10	18.298	1.059	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
11	18.250	0.520 *	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
12	18.240	0.470 *	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
13	18.310	1.048	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
14	18.180	0.250 #	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
15	18.100	0.060 #	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
16	18.050	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
17	18.030	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
18	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
19	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
20	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
21	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
22	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
23	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
24	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
25	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
26	18.020	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
27	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
28	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
29	18.010	0.000	18.010	0.000			18.000	0.000	18.000	0.000	18.000	0.000
30	18.010	0.000	18.010	0.000			18.000	0.000	18.000	0.000	18.000	0.000
31	18.010	0.000	18.010	0.000			18.000	0.000			18.000	0.000
Ten-Daily Mean												
I Ten-Daily	18.264	0.807	18.010	0.000	18.007	0.000	18.000	0.000	18.000	0.000	18.000	0.000
II Ten-Daily	18.122	0.235	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
III Ten-Daily	18.015	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
Monthly												
Min.	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000	18.000	0.000
Max.	18.310	1.071	18.010	0.000	18.010	0.000	18.000	0.000	18.000	0.000	18.000	0.000
Mean	18.130	0.336	18.010	0.000	18.003	0.000	18.000	0.000	18.000	0.000	18.000	0.000

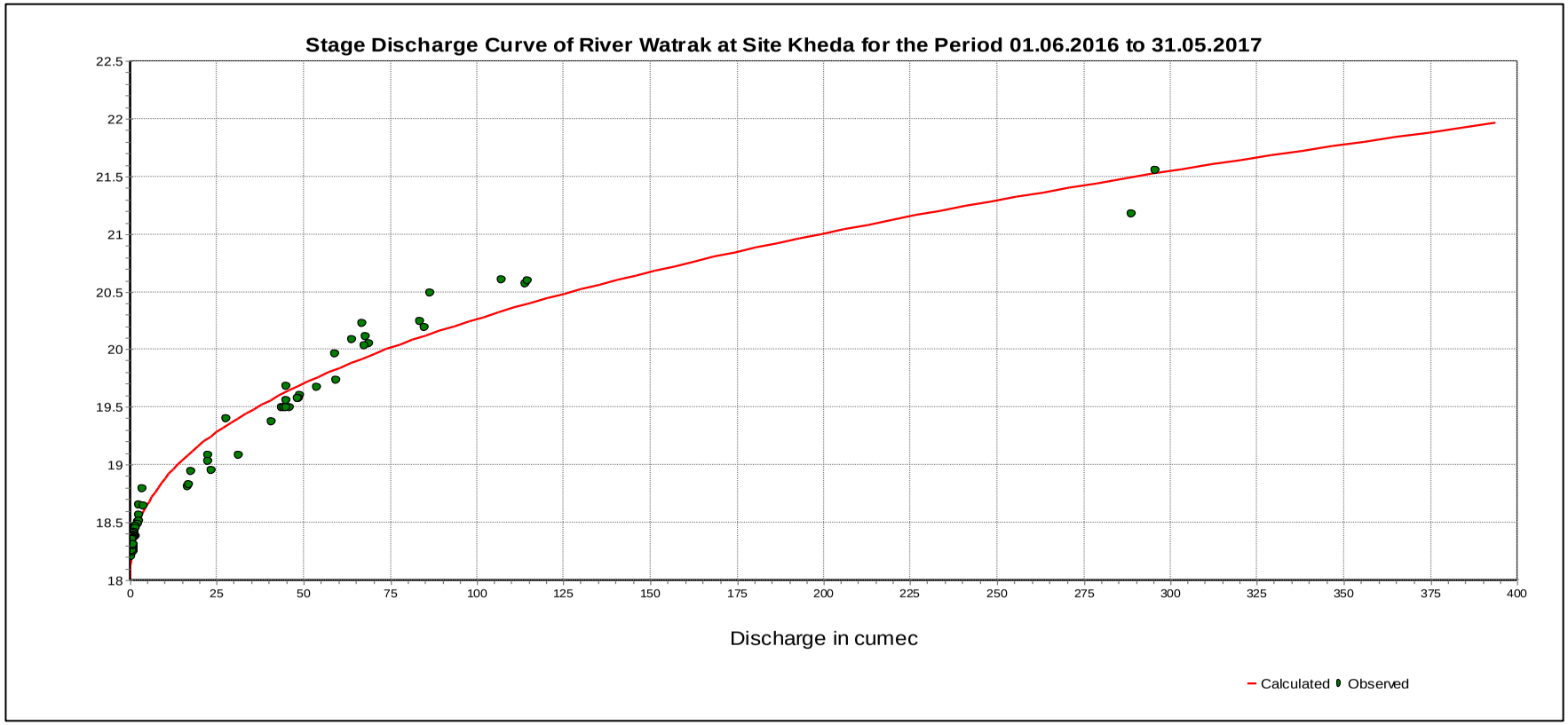
Peak Computed Discharge = 83.36 cumecs on 28/08/2016 Corres. Water Level :20.1 m

Lowest Computed Discharge = 0.000 cumecs on 06/11/2016 Corres. Water Level :18.34 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



Procedure - Standard

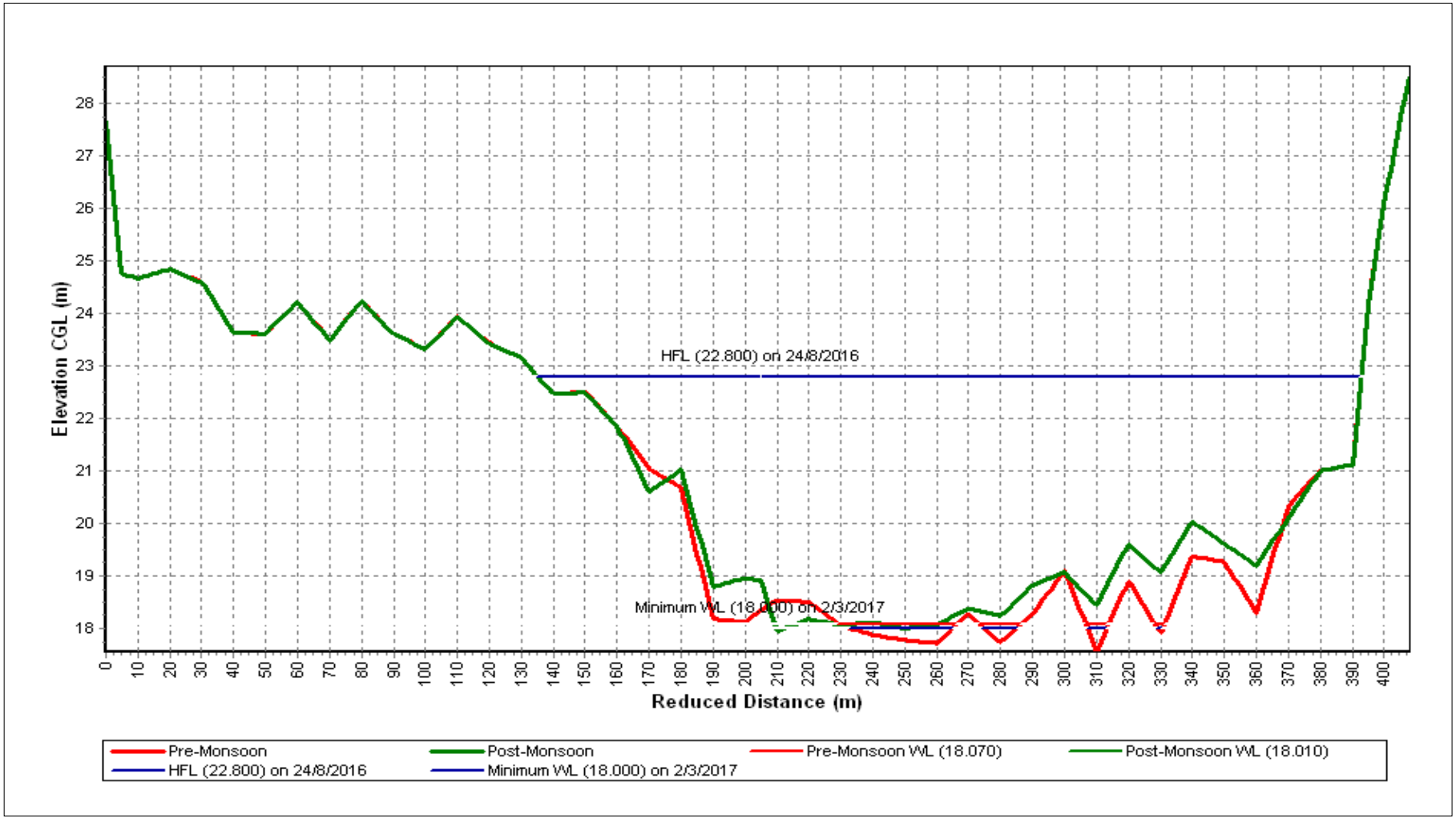
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
18	22	-17.98	2.465	13.078

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

Station Name : Watrak at Kheda (01 02 12 012) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



Historic Flood Level-28.2m on 25.08.1990 at 0800hrs

Note: HFL marked on graph denotes High Flood Level observed during the Water Year 2016-17

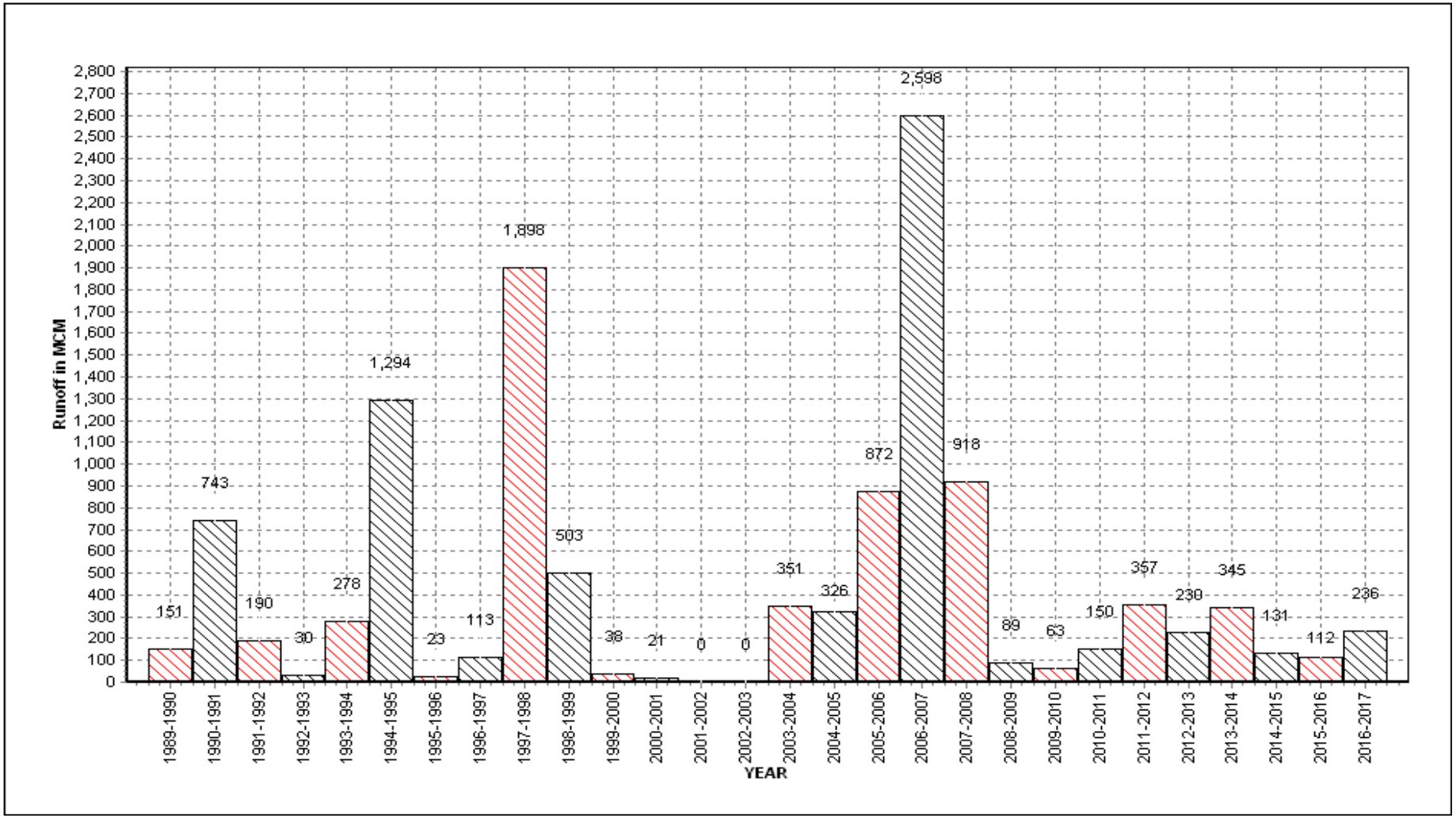
Annual Runoff Values for the period: 1989 - 2017

Station Name : Watrak at Kheda (01 02 12 012)

Local River : Watrak

Division : Mahi Division, Gandhinagar

Sub-Division : Sabarmati Sub Divn., Ahmedabad

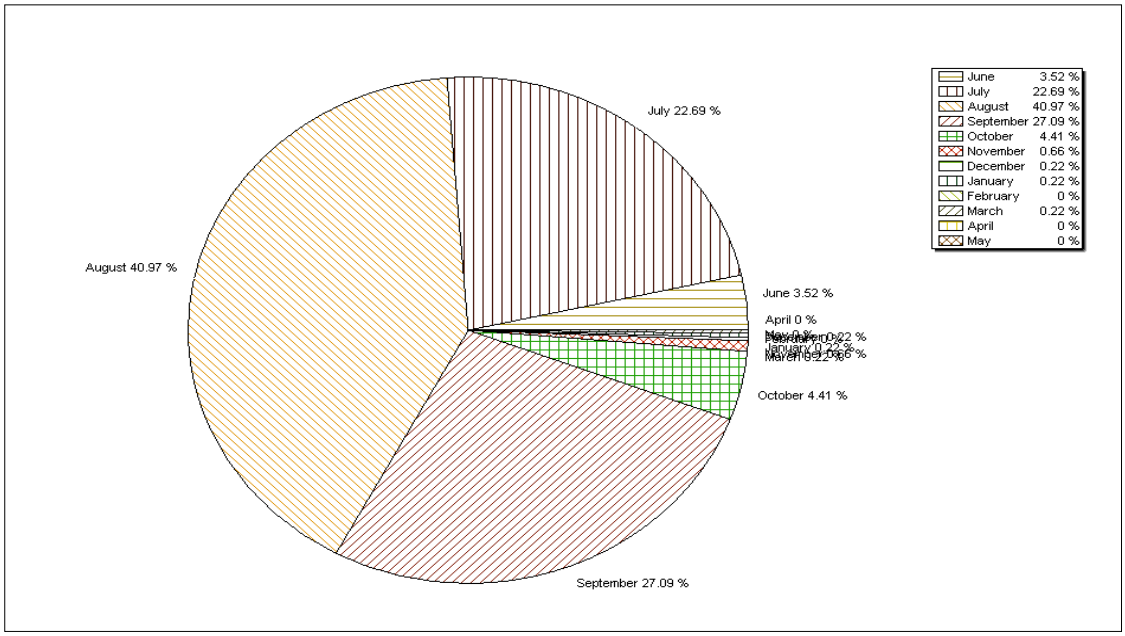


Note: Missing values have not been considered while arriving at Annual Runoff

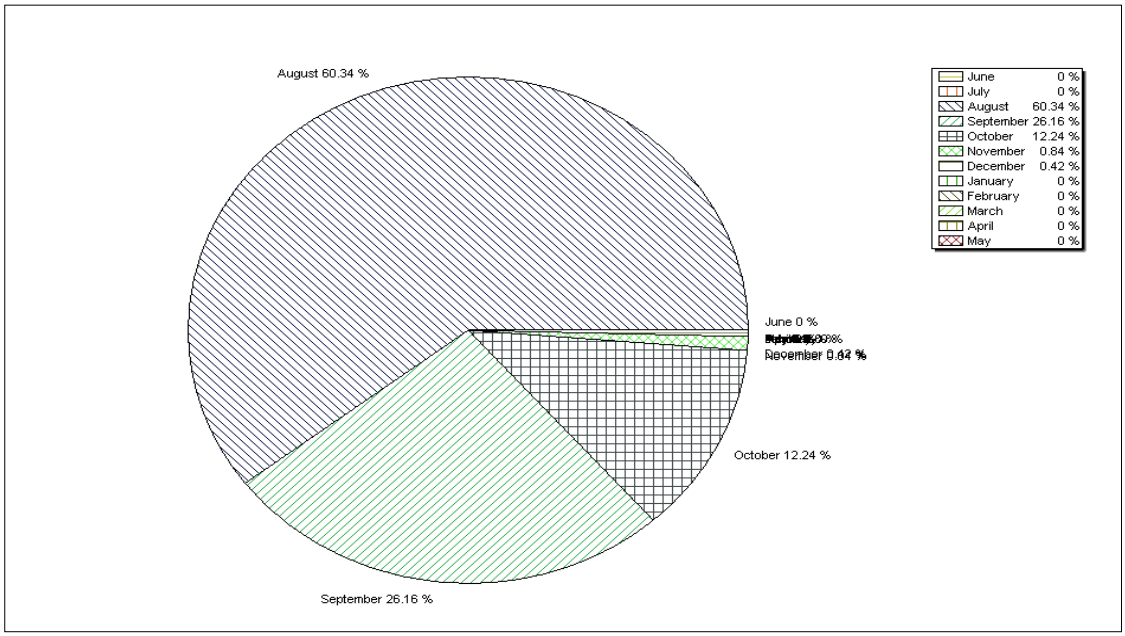
Station Name : Watrak at Kheda (01 02 12 012) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 1989-2016



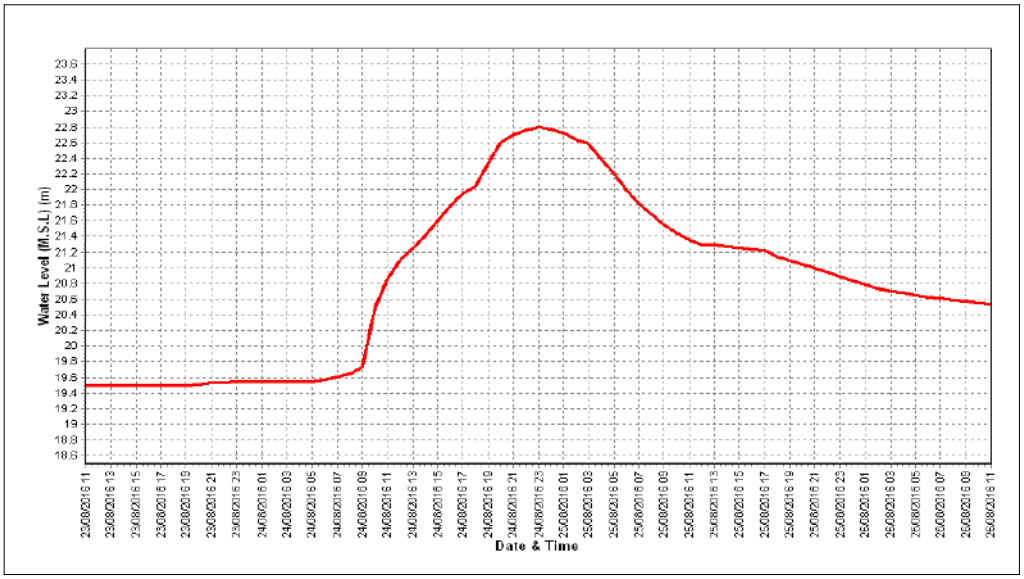
Monthly Runoff for the Year : 2016-2017



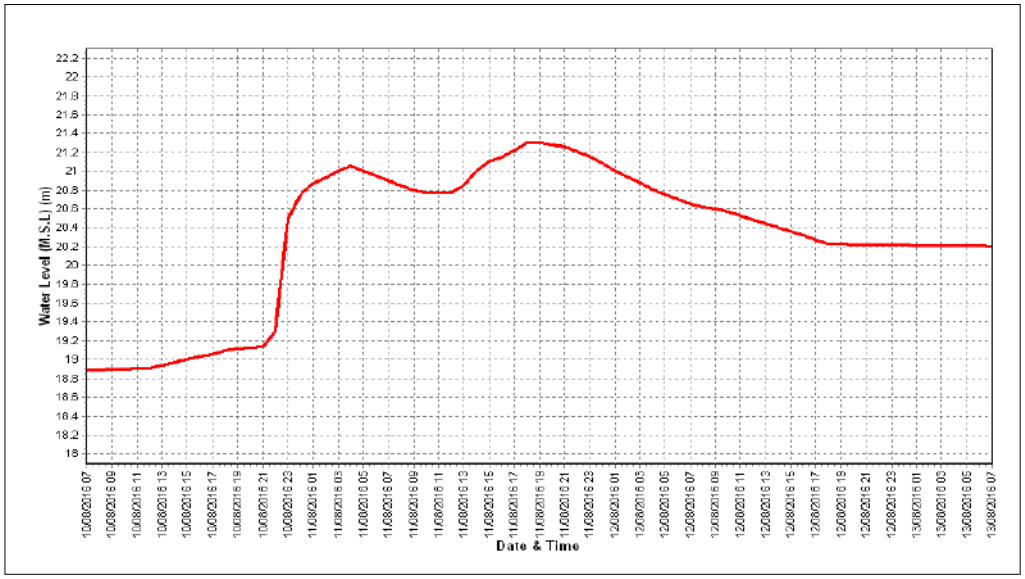
Station Name : Watrak at Kheda (01 02 12 012) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

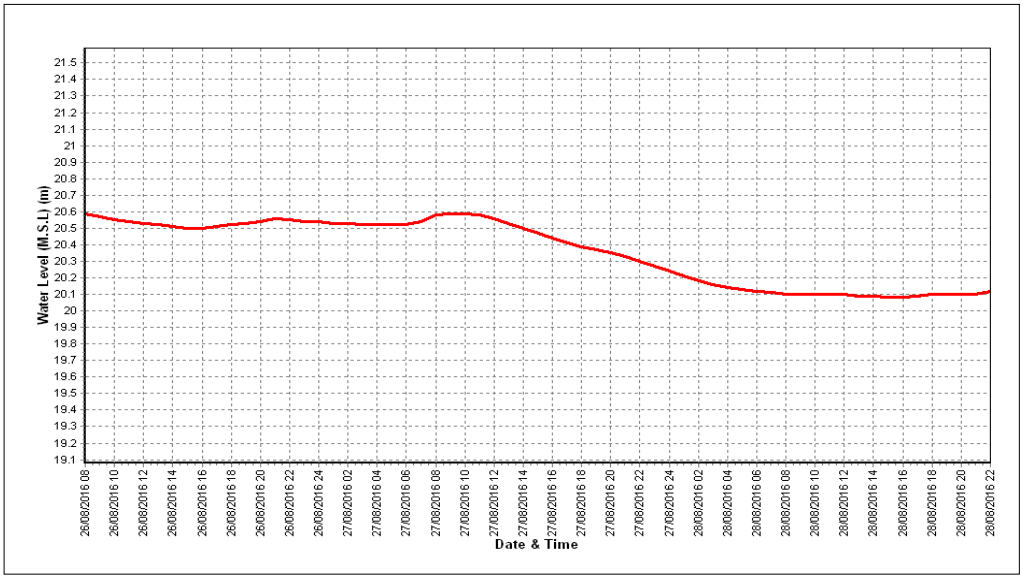
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Watrak at Gadvel (Ratanpur)**	**Code**	:	**01 02 12 010**
State	:	Gujarat	District		Kheda
Basin	:	Sabarmati	Independent River	:	Sabarmati
Tributary	:	Watrak	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Watrak
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	2916 Sq. Km.	Bank	:	Left
Latitude	:	22°58'31"N	Longitude	:	72°53'02"E
Zero of Gauge (m)	:	39.1 (m.s.l) 37 (m.s.l)	30/03/1985 16/06/1990	-	15/06/1990 -
		Opening Date	Closing Date		
Gauge	:	30/03/1985			
Discharge	:	11/07/1989			
Sediment	:	---			
Water Quality	:	---			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1991-1992	467.8	41.000	01/08/1991	0.000	River Dry	05/03/1992
1992-1993	56.13	39.150	08/09/1992	0.000	River Dry	09/05/1993
1993-1994	672.0	41.400	18/07/1993	0.000	River Dry	13/09/1993
1994-1995	735.8	42.185	08/09/1994	0.000	River Dry	09/03/1995
1995-1996	39.38	38.500	20/07/1995	0.000	River Dry	30/01/1996
1996-1997	213.4	39.100	29/07/1996	0.000	River Dry	16/03/1997
1997-1998	1978	44.750	01/08/1997	0.000	River Dry	27/01/1998
1998-1999	365.0	40.725	18/09/1998	0.000	River Dry	10/02/1999
1999-2000	77.92	38.365	21/07/1999	0.000	River Dry	14/02/2000
2000-2001	150.0	38.815	14/07/2000	0.000	River Dry	25/01/2001
2001-2002	17.30	37.890	12/08/2001	0.000	River Dry	25/01/2002
2002-2003	60.50	38.250	05/09/2002	0.000	River Dry	12/01/2003
2003-2004	159.0	39.040	24/08/2003	0.000	River Dry	12/07/2003
2004-2005	253.0	39.400	02/08/2004	0.000	River Dry	18/05/2005
2005-2006	340.6	40.400	01/07/2005	0.000	River Dry	01/06/2005
2006-2007	3732	44.980	12/08/2006	0.000	River Dry	01/06/2006
2007-2008	1526	43.950	10/07/2007	0.000	River Dry	01/06/2007
2008-2009	98.714	40.043	13/08/2010	0.000	River Dry	01/06/2008
2009-2010	101	39.230	24/07/2009	0.000	River Dry	01/06/2009
2010-2011	102.2	39.150	19/09/2010	0.000	River Dry	19/06/2010
2011-2012	134.8	39.000	05/09/2011	0.000	River Dry	09/04/2012
2012-2013	314.9	40.735	08/09/2012	0.000	River Dry	01/06/2012
2013-2014	186.5	40.2	14/08/2013	0.000	River Dry	01/06/2013
2014-2015	142.5	39.325	11/09/2014	0.000	37.1	08/06/2014
2015-2016	132	39.3	29/07/2015	0.000	37.030	04/01/2016
2016-2017	266.1	39.45	11/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	R.Dry	0.000	R.D	0.000	37.070	0.000 *	38.700	119.2	37.430	3.867	37.390	1.600
2	R.Dry	0.000	R.D	0.000	37.090	0.000 *	38.520	96.18	37.430	3.975	37.390	1.584
3	R.Dry	0.000	R.D	0.000	37.100	0.000 *	38.430	79.75	37.430	3.683	37.380	1.472
4	R.Dry	0.000	R.D	0.000	37.090	0.000 *	38.150	49.30 *	37.500	7.029	37.378	1.520
5	R.Dry	0.000	R.D	0.000	37.560	10.28	38.160	53.75	38.050	39.63	37.360	1.540 *
6	R.Dry	0.000	R.D	0.000	37.300	0.620 #	38.130	39.00	38.620	119.5	37.350	1.360 *
7	R.Dry	0.000	R.D	0.000	37.520	5.900 *	38.430	80.19	38.500	105.3	37.350	1.360 *
8	R.Dry	0.000	37.170	0.000	37.730	18.76	38.360	67.49	38.340	73.14	37.340	1.190 *
9	R.Dry	0.000	37.120	0.000	37.740	20.48	37.850	19.83	37.830	19.71	37.340	1.190 *
10	R.Dry	0.000	37.090	0.000	37.830	20.41	37.970	27.97	37.670	16.29	37.330	1.030 *
11	R.Dry	0.000	37.040	0.000	39.450	266.1 #	37.620	10.02 *	37.620	14.83	37.320	0.880 *
12	R.Dry	0.000	37.030	0.000	38.450	112.3	37.570	7.526	37.900	22.09	37.320	0.880 *
13	R.Dry	0.000	37.280	0.410	38.400	61.04	37.510	6.226	37.640	10.08	37.310	0.750 *
14	R.Dry	0.000	37.350	1.360 *	38.050	39.67 *	37.480	6.226	37.570	9.210	37.300	0.620 *
15	R.Dry	0.000	37.730	16.99	37.660	11.97 *	37.460	4.455	37.530	8.282	37.300	0.620 *
16	R.Dry	0.000	37.465	6.402	37.950	28.72	37.440	3.988	37.520	7.229	37.300	0.620 *
17	R.Dry	0.000	37.320	0.880 *	37.900	23.66	37.430	3.650	37.510	6.775	37.290	0.510 *
18	R.Dry	0.000	37.320	3.774	37.780	16.75	37.560	7.420 *	37.500	5.413	37.290	0.510 *
19	R.Dry	0.000	37.210	2.349	37.980	31.88	37.610	9.294	37.500	5.077	37.280	0.410 *
20	R.Dry	0.000	37.180	1.860	38.000	32.87	37.500	6.869	37.490	4.646	37.280	0.410 *
21	R.Dry	0.000	37.140	0.000 #	37.970	32.70 *	37.440	4.259	37.480	4.252	37.270	0.310 *
22	R.Dry	0.000	37.140	0.000 #	38.000	34.80	37.440	4.160	37.470	3.934	37.270	0.310 *
23	R.Dry	0.000	37.110	0.000 #	38.000	33.30	38.400	83.55	37.460	3.812	37.270	0.310 *
24	R.Dry	0.000	37.100	0.000	40.000	408.1 *	38.500	95.60	37.460	3.205	37.260	0.230 *
25	R.Dry	0.000	37.080	0.000	39.520	282.5 *	37.640	10.19	37.450	2.737	37.250	0.170 *
26	R.Dry	0.000	37.060	0.000	38.710	106.5	37.850	20.61	37.430	2.443	37.250	0.170 *
27	R.Dry	0.000	37.050	0.000	38.670	112.9	37.580	8.645	37.430	2.281	37.240	0.110 *
28	R.Dry	0.000	37.050	0.000	38.580	102.3 *	37.510	7.621	37.410	1.994	37.230	0.060 *
29	R.Dry	0.000	37.060	0.000	38.600	110.4	37.480	4.650	37.410	1.959	37.230	0.060 *
30	R.Dry	0.000	37.070	0.000	38.700	111.9	37.460	4.258	37.410	1.921	37.230	0.060 *
31			37.070	0.000	38.490	96.91			37.400	1.761		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	37.127	0.000	37.403	7.644	38.270	63.27	37.880	39.21	37.361	1.385
II Ten-Daily	R.Dry	0.000	37.292	3.403	38.162	62.49	37.518	6.568	37.578	9.363	37.299	0.621
III Ten-Daily	R.Dry	0.000	37.085	0.000	38.658	130.2	37.730	24.35	37.437	2.754	37.250	0.179
Monthly												
Min.	R.Dry	0.000	37.030	0.000	37.070	0.000	37.430	3.650	37.400	1.761	37.230	0.060
Max.	R.Dry	0.000	37.730	16.99	40.000	408.1	38.700	119.2	38.620	119.5	37.390	1.600
Mean	R.Dry	0	37.176	1.418	38.093	68.82	37.839	31.4	37.625	16.65	37.303	0.728

Annual Runoff in MCM = 315 Annual Runoff in mm = 108

Peak Observed Discharge = 266.1 cumecs on 11/08/2016 Corres. Water Level :39.45 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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 Data for the period 2016 - 2017

Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	37.230	0.060 *	37.210	0.000	37.210	0.000	37.190	0.000	37.130	0.000	R.Dry	0.000
2	37.230	0.060 *	37.210	0.000	37.210	0.000	37.180	0.000	37.120	0.000	R.Dry	0.000
3	37.230	0.060 *	37.210	0.000	37.210	0.000	37.180	0.000	37.110	0.000	R.Dry	0.000
4	37.230	0.060 *	37.210	0.000	37.200	0.000	37.180	0.000	37.110	0.000	R.Dry	0.000
5	37.230	0.060 *	37.210	0.000	37.200	0.000	37.180	0.000	37.100	0.000	R.Dry	0.000
6	37.230	0.060 *	37.210	0.000	37.200	0.000	37.180	0.000	37.100	0.000	R.Dry	0.000
7	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.090	0.000	R.Dry	0.000
8	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.090	0.000	R.Dry	0.000
9	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.090	0.000	R.Dry	0.000
10	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.080	0.000	R.Dry	0.000
11	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.080	0.000	R.Dry	0.000
12	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.070	0.000	R.Dry	0.000
13	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.070	0.000	R.Dry	0.000
14	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.070	0.000	R.Dry	0.000
15	37.220	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.060	0.000	R.Dry	0.000
16	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.050	0.000	R.Dry	0.000
17	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.050	0.000	R.Dry	0.000
18	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.050	0.000	R.Dry	0.000
19	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.050	0.000	R.Dry	0.000
20	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.040	0.000	R.Dry	0.000
21	37.210	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.040	0.000	R.Dry	0.000
22	37.210	0.000	37.210	0.000	37.190	0.000	37.170	0.000	37.040	0.000	R.Dry	0.000
23	37.210	0.000	37.210	0.000	37.190	0.000	37.170	0.000	37.040	0.000	R.Dry	0.000
24	37.210	0.000	37.210	0.000	37.190	0.000	37.170	0.000	37.040	0.000	R.Dry	0.000
25	37.210	0.000	37.210	0.000	37.190	0.000	37.160	0.000	37.030	0.000	R.Dry	0.000
26	37.210	0.000	37.210	0.000	37.190	0.000	37.160	0.000	37.030	0.000 *	R.Dry	0.000
27	37.210	0.000	37.210	0.000	37.190	0.000	37.150	0.000	37.030	0.000	R.Dry	0.000
28	37.210	0.000	37.210	0.000	37.190	0.000	37.150	0.000	37.030	0.000	R.Dry	0.000
29	37.210	0.000	37.210	0.000			37.140	0.000	R.Dry	0.000	R.Dry	0.000
30	37.210	0.000	37.210	0.000			37.130	0.000	R.Dry	0.000	R.Dry	0.000
31	37.210	0.000	37.210	0.000			37.130	0.000			R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	37.226	0.036	37.210	0.000	37.199	0.000	37.181	0.000	37.102	0.000	R.Dry	0.000
II Ten-Daily	37.215	0.000	37.210	0.000	37.190	0.000	37.180	0.000	37.059	0.000	R.Dry	0.000
III Ten-Daily	37.210	0.000	37.210	0.000	37.190	0.000	37.155	0.000	37.035	0.000	R.Dry	0.000
Monthly												
Min.	37.210	0.000	37.210	0.000	37.190	0.000	37.130	0.000	37.030	0.000	R.Dry	0.000
Max.	37.230	0.060	37.210	0.000	37.210	0.000	37.190	0.000	37.130	0.000	R.Dry	0.000
Mean	37.217	0.012	37.210	0	37.193	0	37.172	0	37.068	0	R.Dry	0

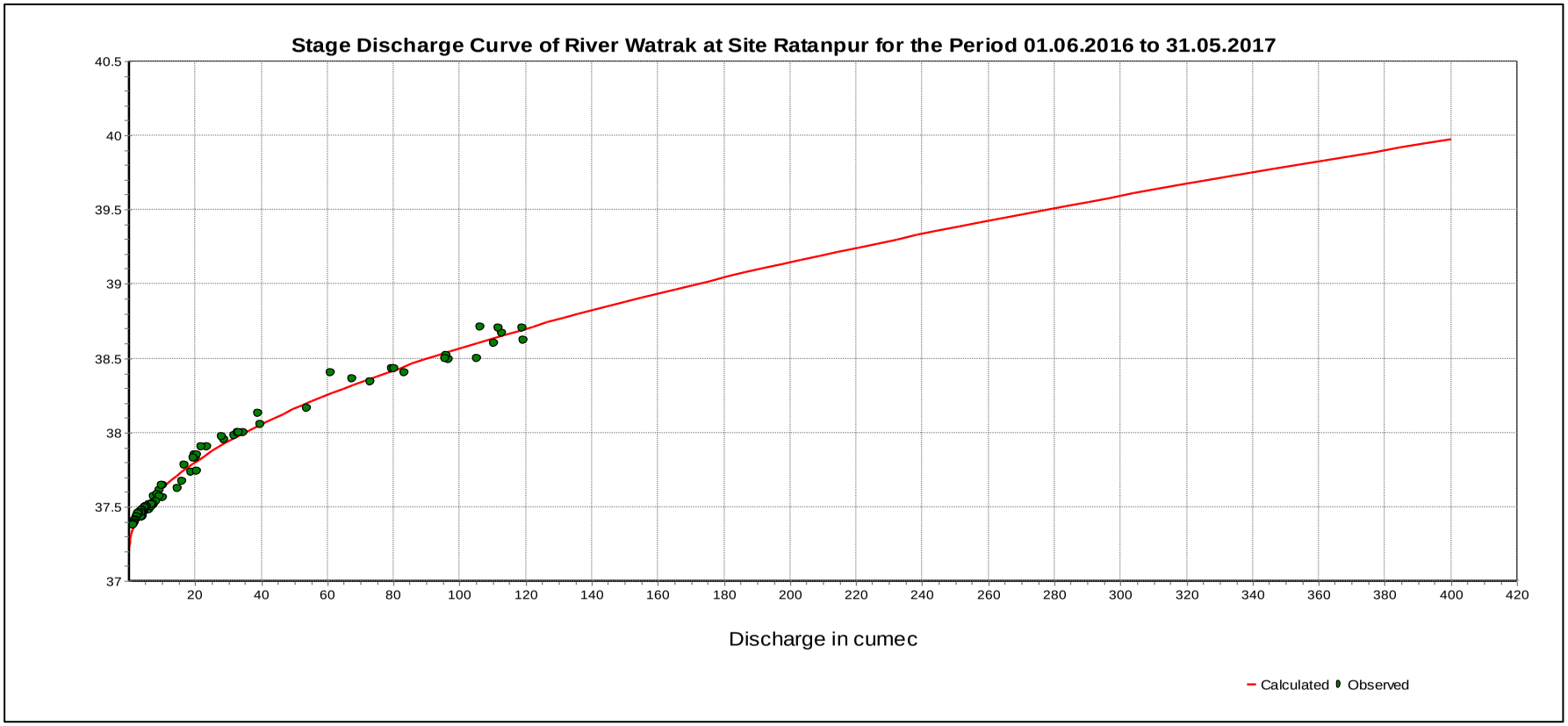
Peak Computed Discharge = 408.1 cumecs on 24/08/2016 **Corres. Water Level :40 m**

Lowest Computed Discharge = 0.000 cumecs on 01/08/2016 **Corres. Water Level :37.07 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



Procedure - Standard

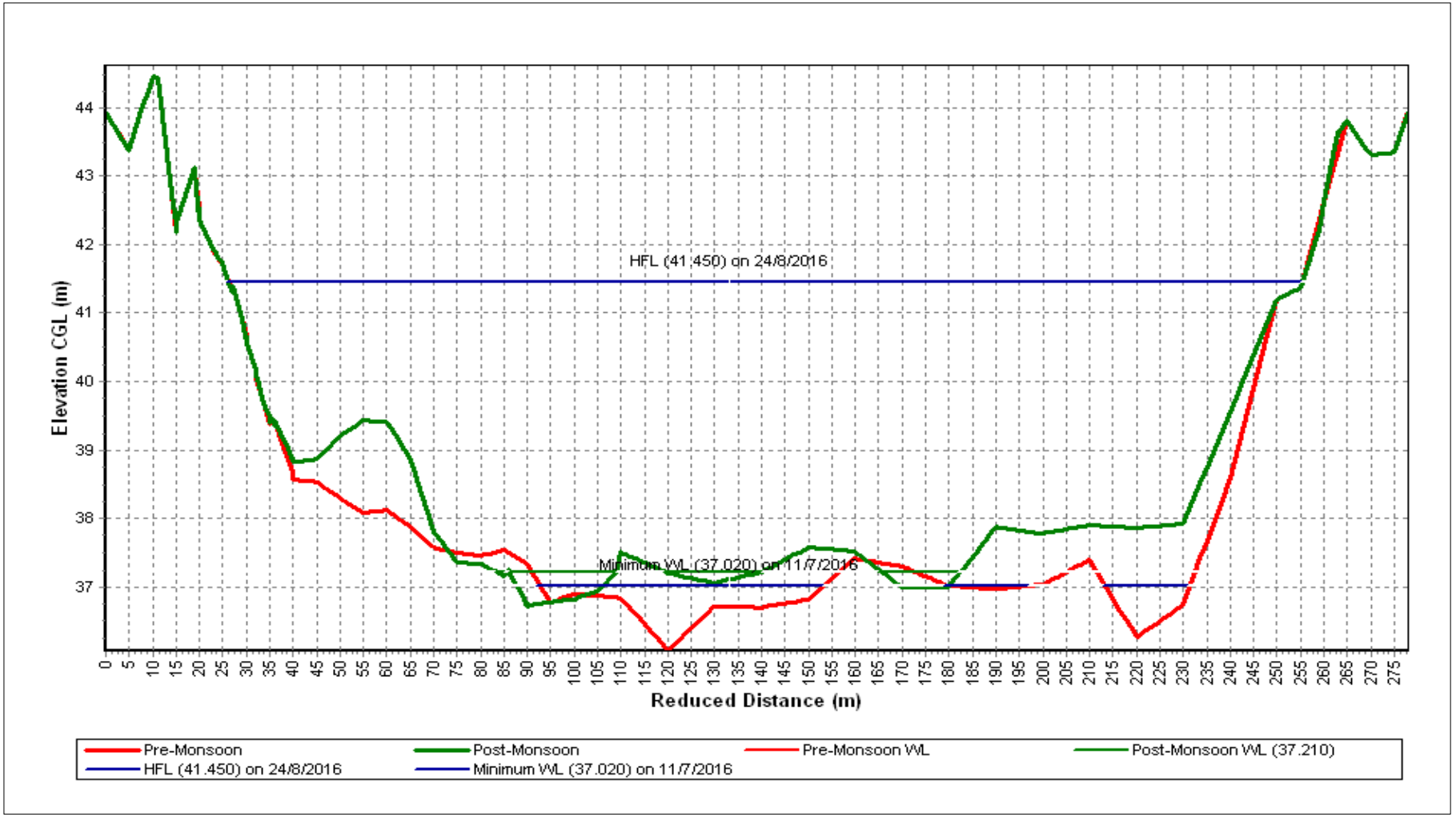
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
37.2	40	-37.198	1.958	54.279

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

Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



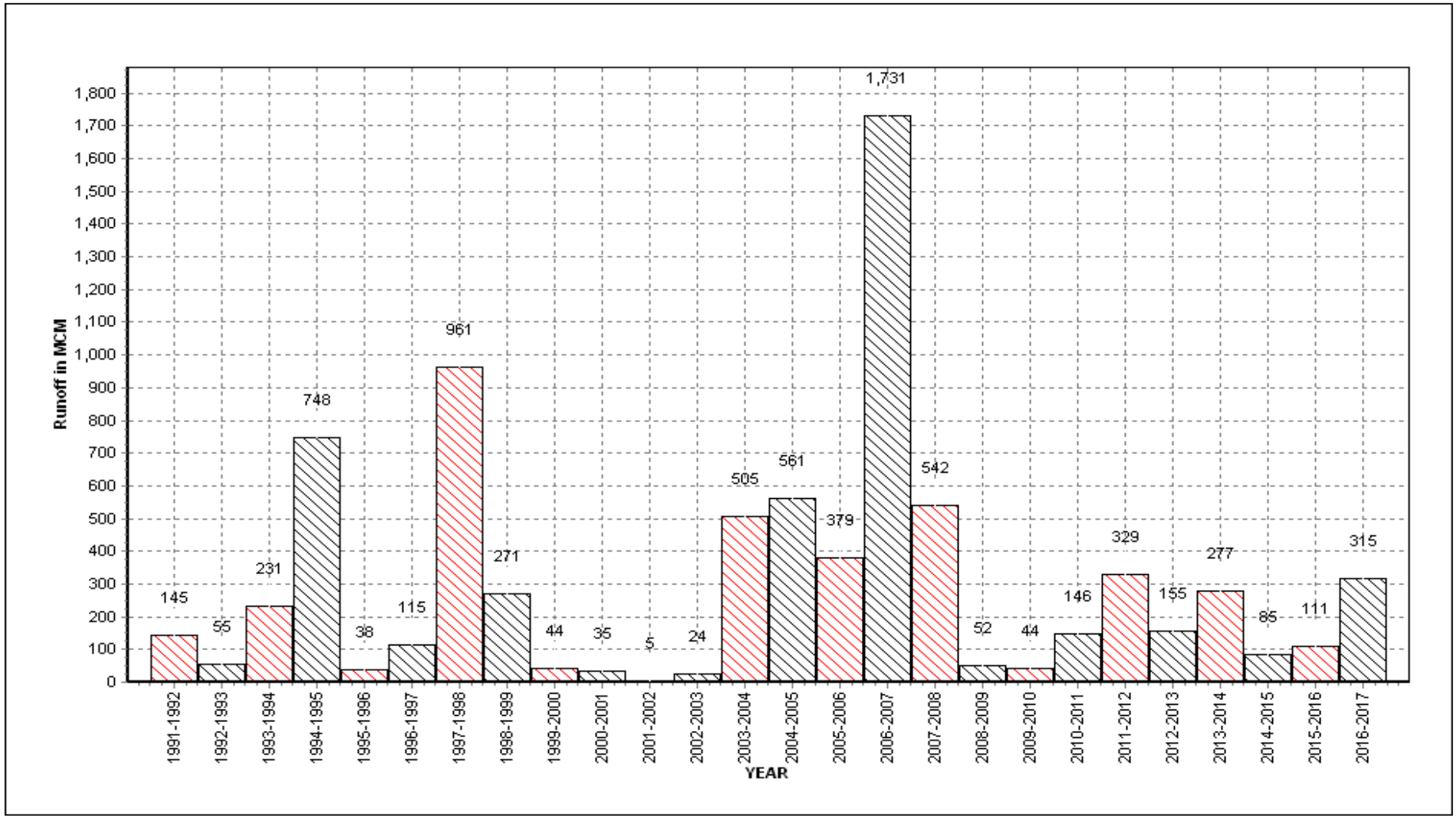
Historical Flood Level : 48.200 m on 28.07.1997 at 0200 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1991 - 2017

Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

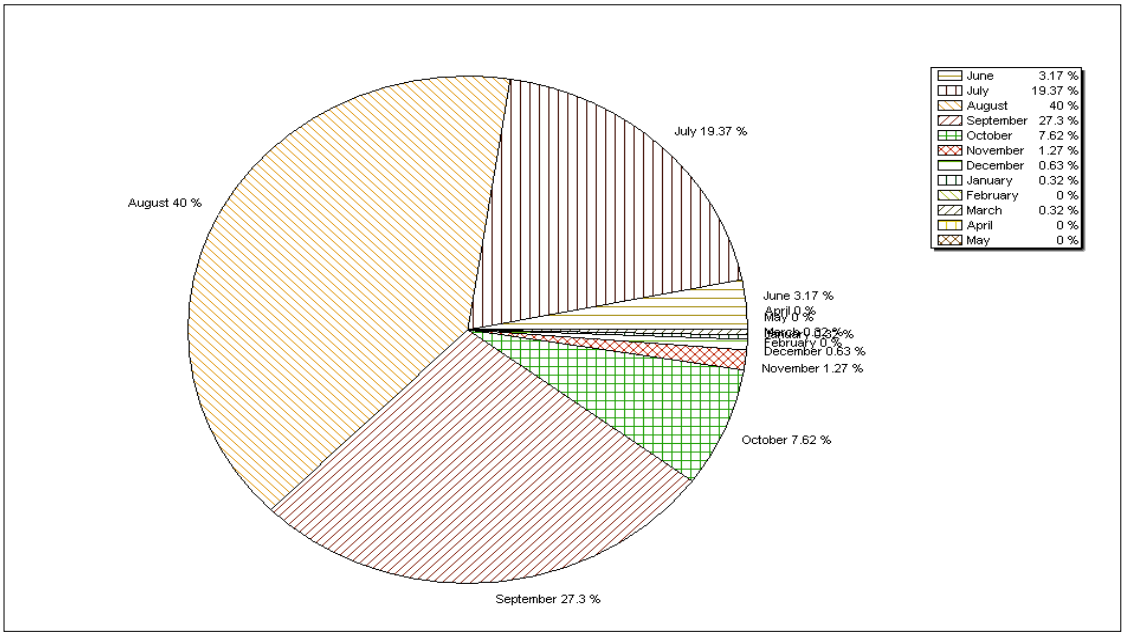


Note: Missing values have not been considered while arriving at Annual Runoff

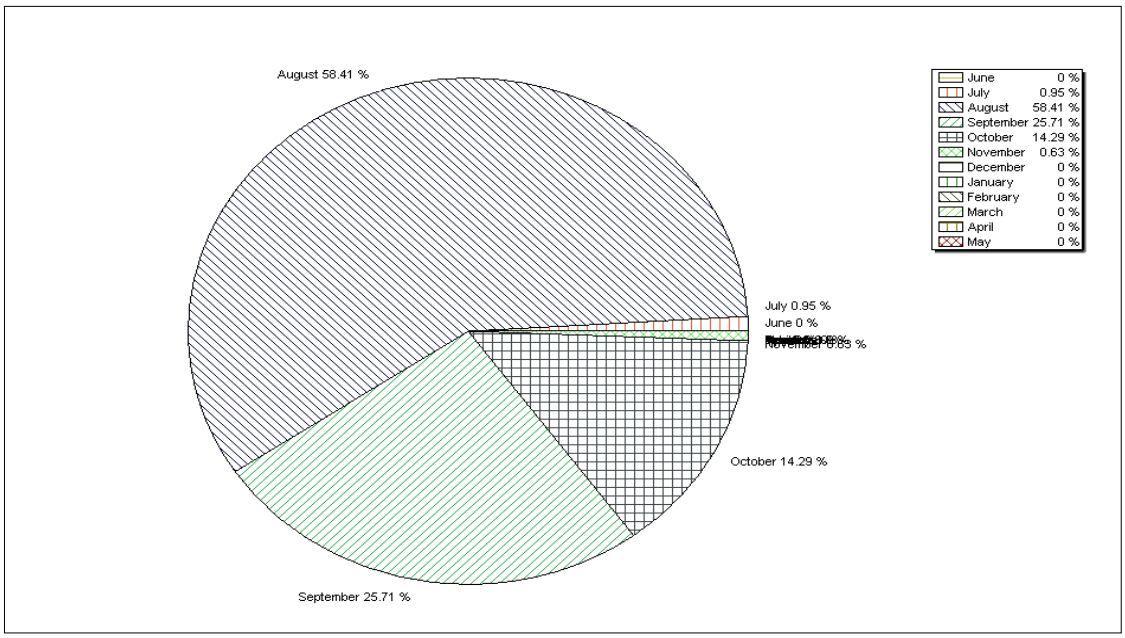
Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 1991-2016



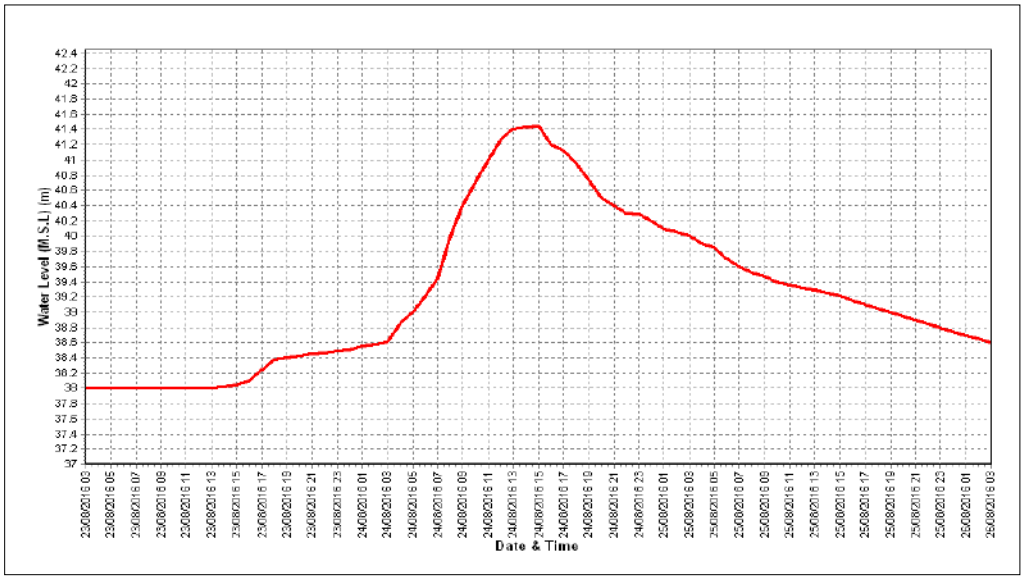
Monthly Runoff for the Year : 2016-2017



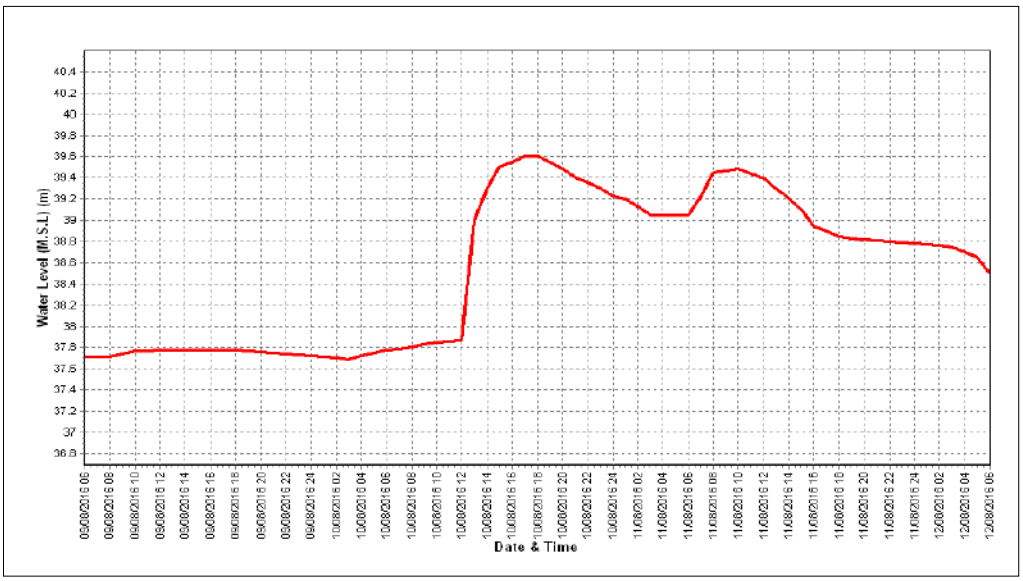
Station Name : Watrak at Gadvel (Ratanpur) (01 02 12 010) **Division : Mahi Division, Gandhinagar**

Local River : Watrak **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

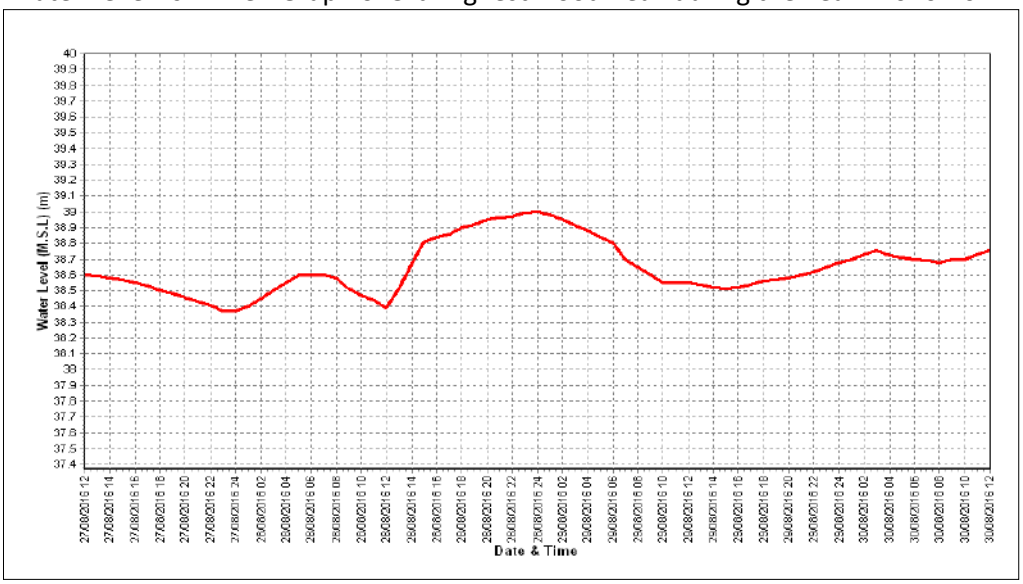
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Sabarmati at Derol Bridge**	**Code**	**:**	**01 02 12 006**
State	:	Gujarat	District		Sabarkantha
Basin	:	Sabarmati	Independent River	:	Sabarmati
Tributary	:	Sabarmati	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Sabarmati
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	N.W.R.Sub Div., Himatnagar
Drainage Area	:	6724 Sq. Km.	Bank	:	Left
Latitude	:	23°34'24"N	Longitude	:	72°48'25"E
Zero of Gauge (m)	:	89 (m.s.l) 87 (m.s.l)	19/08/1980 01/06/2005	-	31/05/2005 -
		Opening Date	**Closing Date**		
Gauge	:	19/08/1980			
Discharge	:	01/06/1991			
Sediment	:	25/09/1992			
Water Quality	:	15/07/1992			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1992-1993	1964	94.130	08/09/1992	1.894	89.840	21/08/1992
1993-1994	1611	93.634	18/07/1993	5.400	89.980	10/11/1993
1994-1995	3050	94.730	20/08/1994	6.360	89.880	24/12/1994
1995-1996	55.80	90.550	22/07/1995	1.891	89.680	08/08/1995
1996-1997	34.00	91.000	30/08/1996	0.301	89.500	29/09/1996
1997-1998	1290	93.230	26/06/1997	0.840	89.600	10/06/1997
1998-1999	25.40	91.300	18/09/1998	0.041	89.780	06/10/1998
1999-2000	29.00	91.205	22/06/1999	0.000	River Dry	26/01/2000
2000-2001	River Dry					
2001-2002	19.10	90.890	12/07/2001	0.000	River Dry	17/01/2002
2002-2003	20.40	90.950	29/06/2002	0.000	River Dry	25/01/2003
2003-2004	73.85	91.070	28/08/2003	0.000	River Dry	26/01/2004
2004-2005	55.50	90.750	06/08/2004	0.000	River Dry	09/05/2005
2005-2006	224.7	92.300	03/10/2005	0.000	River Dry	01/06/2005
2006-2007	3079*	94.700	16/08/2006	0.000	River Dry	01/06/2006
2007-2008	842.2	92.075	09/08/2007	0.000	River Dry	01/06/2007
2008-2009	66.49	89.575	27/08/2008	0.000	River Dry	01/06/2008
2009-2010	72.99	89.650	30/08/2009	0.000	River Dry	01/06/2009
2010-2011	205.5	90.200	25/07/2010	0.000	River Dry	01/06/2010
2011-2012	386.5	90.400	12/09/2011	5.085	87.700	13/10/2011
2012-2013	67.8	88.800	12/09/2012	0.000	87.450	15/07/2012
2013-2014	169.3	89.6	02/08/2013	0.000	River Dry	01/06/2013
2014-2015	205.2	89.575	09/09/2014	0.000	87.07	01/06/2014
2015-2016	3129	92.3	30/07/2015	0.000	87.160	28/01/2016
2016-2017	830.3	89.85	24/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

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	R.Dry	0.000	R.Dry	0.000	87.160	0.000	89.100	360.6	87.220	1.070	87.140	0.170 *
2	R.Dry	0.000	R.Dry	0.000	87.160	0.000	88.900	312.6	87.210	1.090 *	87.130	0.110 *
3	R.Dry	0.000	R.Dry	0.000	87.150	0.000	88.425	218.8	87.205	0.667	87.120	0.060 *
4	R.Dry	0.000	R.Dry	0.000	87.150	0.000	88.150	110.3 *	87.255	3.157	87.120	0.060 *
5	R.Dry	0.000	R.Dry	0.000	87.150	0.000	88.100	129.6	88.150	151.9	87.110	0.000
6	R.Dry	0.000	R.Dry	0.000	87.160	0.000	87.580	18.73	88.400	201.9	87.110	0.000
7	R.Dry	0.000	R.Dry	0.000	87.200	0.000	87.475	16.49	87.650	28.55 #	87.100	0.000
8	R.Dry	0.000	R.Dry	0.000	87.210	0.000	87.560	16.74	88.540	225.3	87.100	0.000
9	R.Dry	0.000	R.Dry	0.000	87.270	1.810	87.470	9.375	88.020	83.59 *	87.090	0.000
10	R.Dry	0.000	R.Dry	0.000	87.990	106.9	87.440	7.938	87.500	14.99	87.090	0.000
11	R.Dry	0.000	R.Dry	0.000	87.420	5.650	87.420	9.310 *	87.410	8.730 *	87.090	0.000
12	R.Dry	0.000	R.Dry	0.000	87.290	2.740	87.380	4.255	87.370	6.580 *	87.090	0.000
13	R.Dry	0.000	87.790	45.79 #	87.270	2.685	87.360	6.090 *	87.340	3.324	87.180	0.590 *
14	R.Dry	0.000	87.310	4.403	87.260	2.290 *	87.350	5.620 #	87.305	3.199	87.180	0.590 *
15	R.Dry	0.000	87.220	1.811	87.240	1.750 *	88.000	120.5	87.300	3.190	87.180	0.590 *
16	R.Dry	0.000	87.190	0.740 #	87.220	1.360	87.890	104.8	87.285	3.060 *	87.180	0.590 *
17	R.Dry	0.000	87.180	0.590 *	87.200	1.304	87.730	37.88 #	87.280	2.593	87.180	0.590 *
18	R.Dry	0.000	87.180	0.538	87.190	0.922	87.650	28.55 *	87.265	2.404	87.170	0.460 *
19	R.Dry	0.000	87.175	0.506	87.180	0.590 *	87.520	15.37	87.255	1.896	87.170	0.460 *
20	R.Dry	0.000	87.175	0.000	87.180	0.590 *	87.480	13.75	87.245	1.488	87.170	0.350 *
21	R.Dry	0.000	87.175	0.000	87.180	0.590 *	87.400	7.341	87.235	1.372	87.160	0.350 *
22	R.Dry	0.000	87.170	0.000	87.170	0.758	87.380	6.210	87.230	1.329	87.160	0.350 *
23	R.Dry	0.000	87.170	0.000	89.300	524.6	87.370	6.007	87.225	1.400 *	87.160	0.350 *
24	R.Dry	0.000	87.160	0.000	89.850	830.3	87.350	4.274	87.220	1.275	87.150	0.250 *
25	R.Dry	0.000	87.150	0.000	89.100	427.6 *	87.420	9.310 *	87.210	1.243	87.150	0.250 *
26	R.Dry	0.000	87.140	0.000	88.000	116.3	87.350	2.849	87.190	1.317	87.150	0.250 *
27	R.Dry	0.000	87.150	0.000	87.655	32.09	87.305	2.054	87.180	1.235	87.150	0.250 *
28	R.Dry	0.000	87.155	0.000	89.380	563.7 *	87.250	2.656	87.170	0.460 #	87.150	0.250 *
29	R.Dry	0.000	87.155	0.000	88.525	221.6	87.230	2.702	87.160	0.350 #	87.150	0.250 *
30	R.Dry	0.000	87.160	0.000	88.470	224.6	87.230	2.038	87.150	0.250 *	87.150	0.250 *
31			87.170	0.000	88.340	177.9			87.150	0.250 *		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000			87.260	10.87	88.020	120.1	87.715	71.22	87.111	0.040
II Ten-Daily	R.Dry	0.000	87.277	6.797	87.245	1.988	87.578	34.62	87.306	3.646	87.159	0.422
III Ten-Daily	R.Dry	0.000	87.160	0.000	88.452	283.6	87.328	4.544	87.193	0.953	87.153	0.280
Monthly												
Min.	R.Dry	0.000	87.140	0.000	87.150	0.000	87.230	2.038	87.150	0.250	87.090	0.000
Max.	R.Dry	0.000	87.790	45.79	89.850	830.3	89.100	360.6	88.540	225.3	87.180	0.590
Mean	R.Dry	0.000	87.209	2.862	87.678	104.8	87.642	53.09	87.398	24.49	87.141	0.247

Annual Runoff in MCM = 490 Annual Runoff in mm = 73

Peak Observed Discharge = 830.3 cumecs on 24/08/2016 Corres. Water Level :89.85 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

Note: River in pooling condition from 20.07.2016 to 08.08.2016

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 Data for the period 2016 - 2017

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.125	0.000
2	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.125	0.000
3	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.125	0.000
4	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
5	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
6	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
7	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
8	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
9	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
10	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
11	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.130	0.000	87.120	0.000
12	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.115	0.000	87.130	0.000	87.120	0.000
13	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.115	0.000	87.130	0.000	87.120	0.000
14	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.115	0.000	87.130	0.000	87.120	0.000
15	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.115	0.000	87.130	0.000	87.120	0.000
16	87.150	0.250 *	87.140	0.170 *	87.130	0.110 *	87.140	0.000	87.130	0.000	87.120	0.000
17	87.140	0.170 *	87.140	0.170 *	87.130	0.110 *	87.140	0.000	87.125	0.000	87.120	0.000
18	87.140	0.170 *	87.140	0.170 *	87.130	0.110 *	87.140	0.000	87.125	0.000	87.120	0.000
19	87.140	0.170 *	87.140	0.170 *	87.130	0.110 *	87.140	0.000	87.125	0.000	87.120	0.000
20	87.140	0.170 *	87.140	0.170 *	87.130	0.110 *	87.135	0.000	87.125	0.000	87.120	0.000
21	87.140	0.170 *	87.140	0.170 *	87.130	0.110 *	87.135	0.000	87.125	0.000	87.120	0.000
22	87.140	0.170 *	87.140	0.170 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
23	87.140	0.170 *	87.140	0.170 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
24	87.140	0.170 *	87.140	0.170 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
25	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
26	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000 *
27	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
28	87.140	0.170 *	87.130	0.110 *	87.120	0.060 *	87.135	0.000	87.125	0.000	87.120	0.000
29	87.140	0.170 *	87.130	0.110 *			87.135	0.000	87.125	0.000	87.120	0.000
30	87.140	0.170 *	87.130	0.110 *			87.135	0.000	87.125	0.000	87.120	0.000
31	87.140	0.170 *	87.130	0.110 *			87.135	0.000			87.115	0.000
Ten-Daily Mean												
I Ten-Daily	87.150	0.250	87.140	0.170	87.130	0.110	87.120	0.060	87.130	0.000	87.121	0.000
II Ten-Daily	87.146	0.218	87.140	0.170	87.130	0.110	87.128	0.006	87.128	0.000	87.120	0.000
III Ten-Daily	87.140	0.170	87.134	0.132	87.121	0.066	87.135	0.000	87.125	0.000	87.120	0.000
Monthly												
Min.	87.140	0.170	87.130	0.110	87.120	0.060	87.115	0.000	87.125	0.000	87.115	0.000
Max.	87.150	0.250	87.140	0.170	87.130	0.110	87.140	0.060	87.130	0.000	87.125	0.000
Mean	87.145	0.211	87.138	0.156	87.127	0.098	87.128	0.021	87.128	0	87.120	0

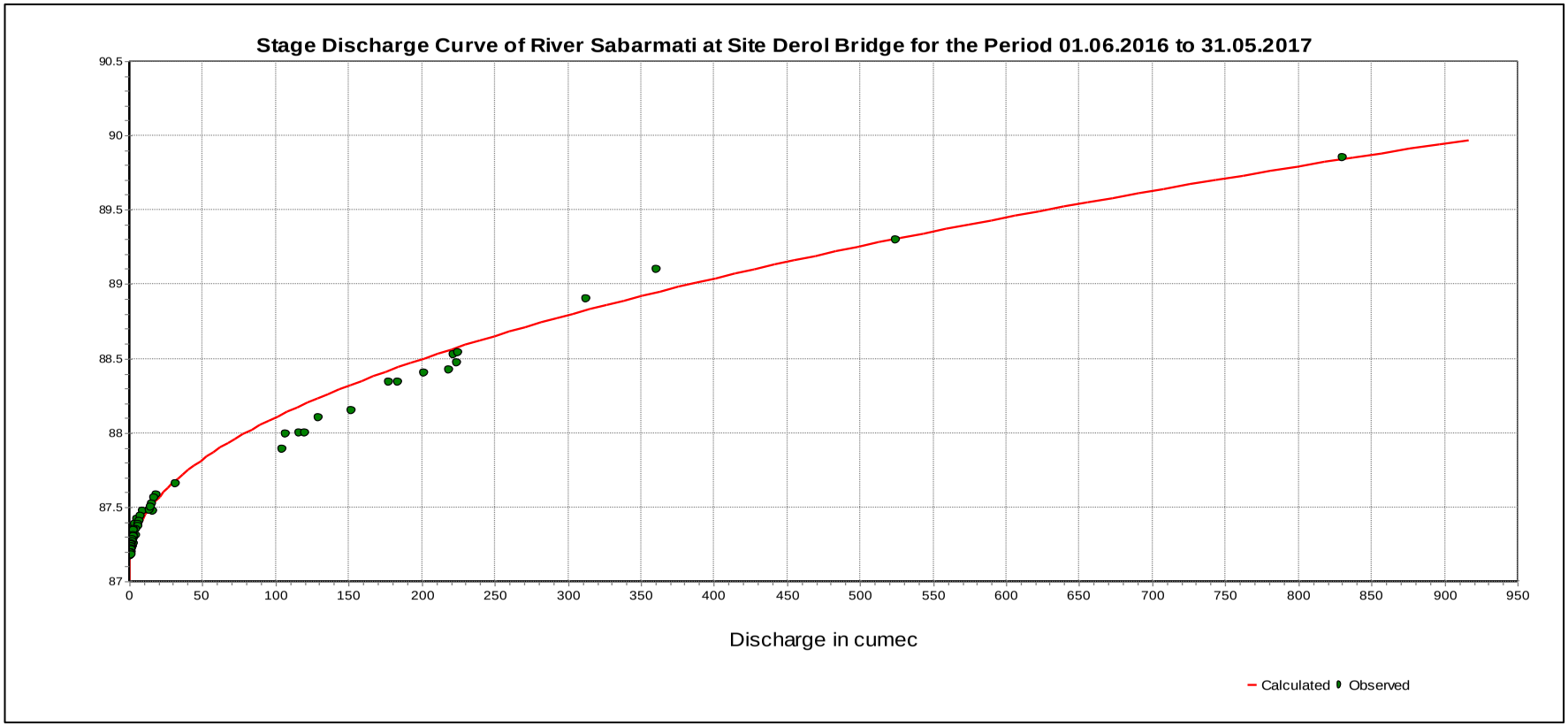
Peak Computed Discharge = 563.7 cumecs on 28/08/2016 Corres. Water Level :89.38 m

Lowest Computed Discharge = 0.000 cumecs on 26/05/2017 Corres. Water Level :87.12 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



Procedure - Standard

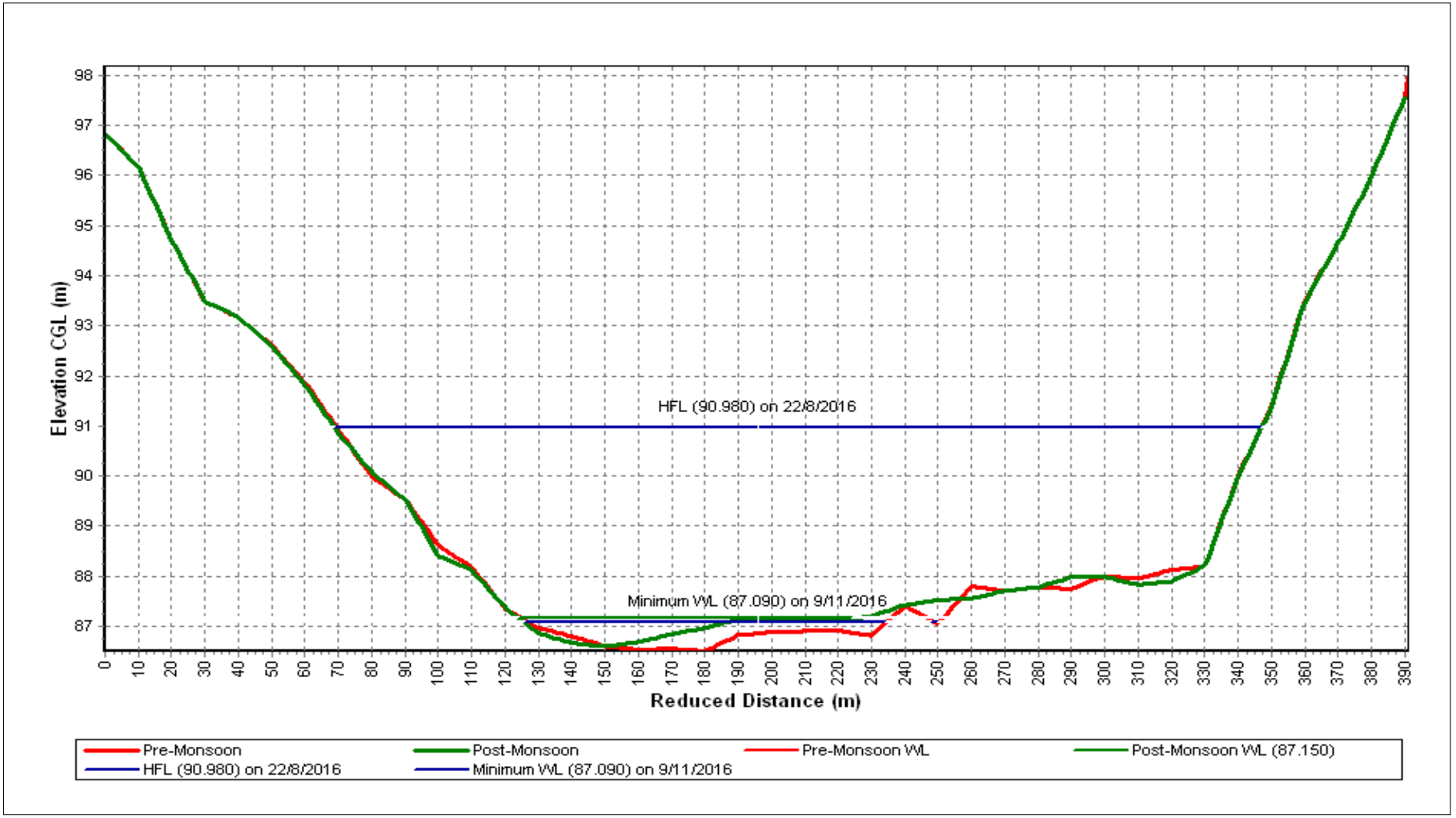
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
87	90	87.09	2.118	97.475

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

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**



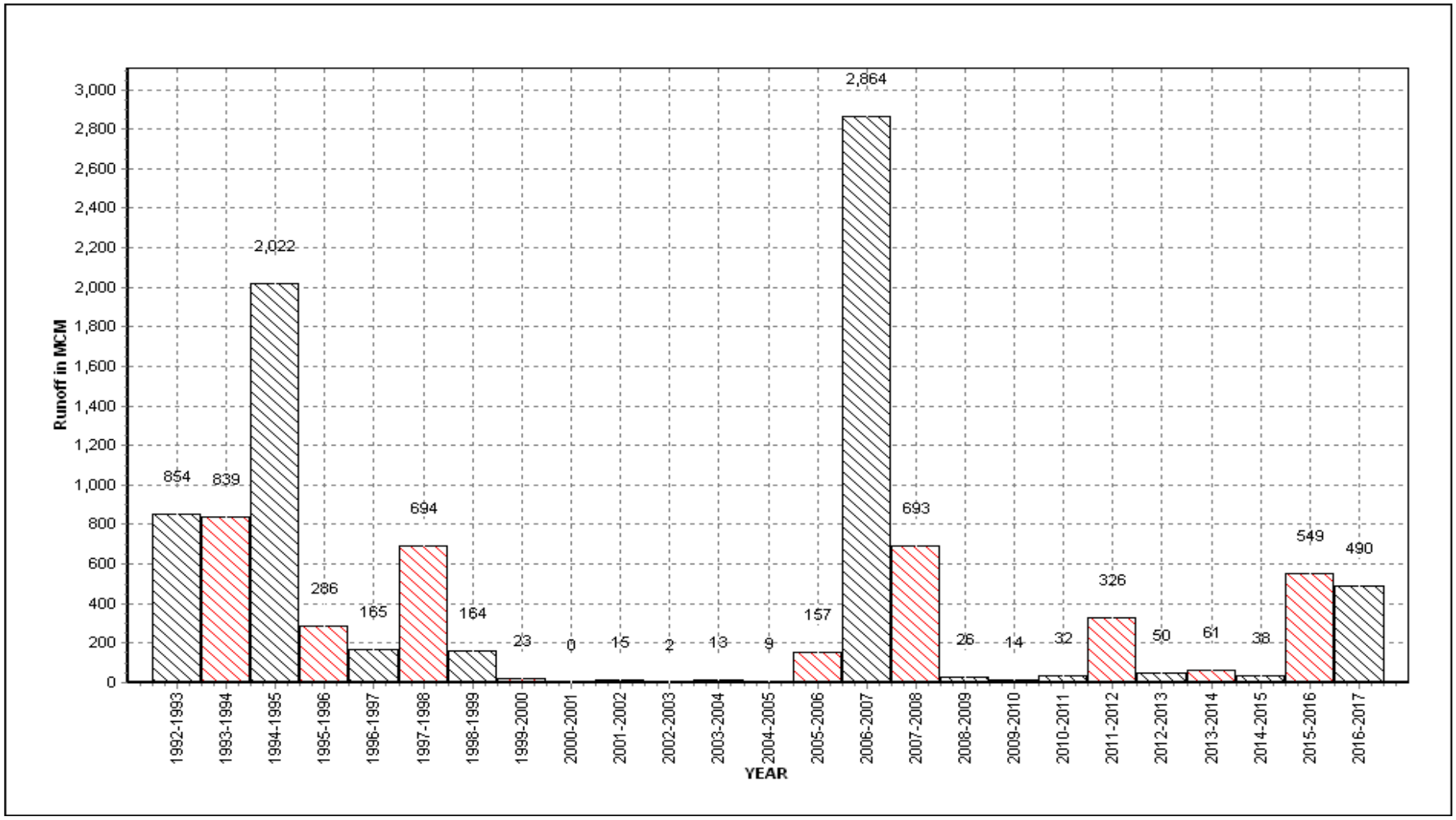
Historic Flood Level - 95.83 m on 17.07.1993 at 1800 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1992 - 2017

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

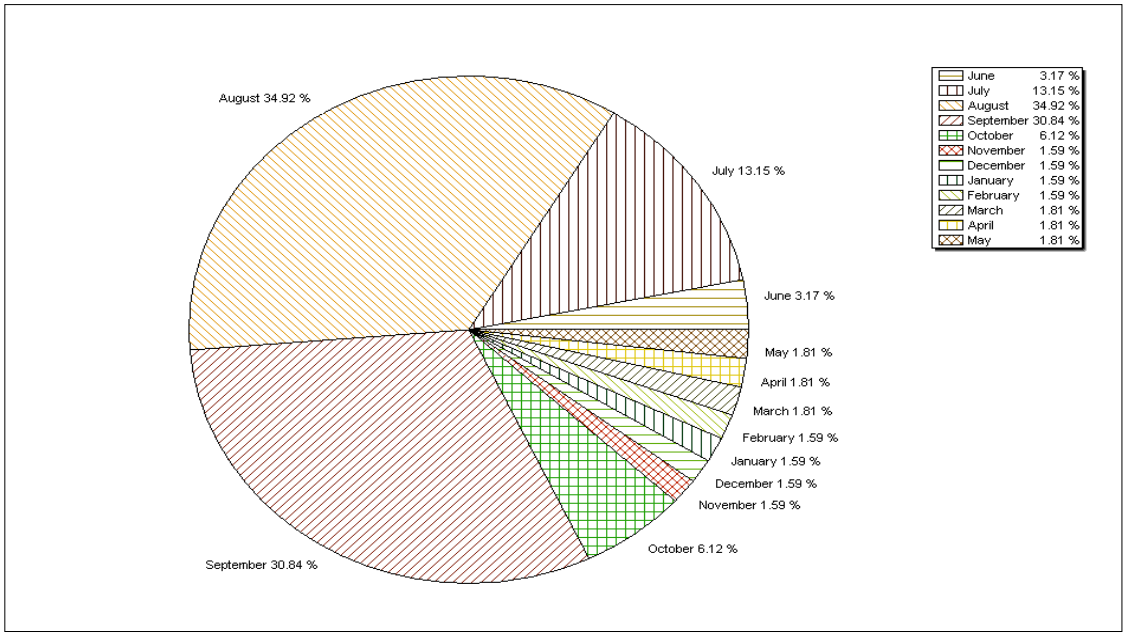


Note: Missing values have not been considered while arriving at Annual Runoff

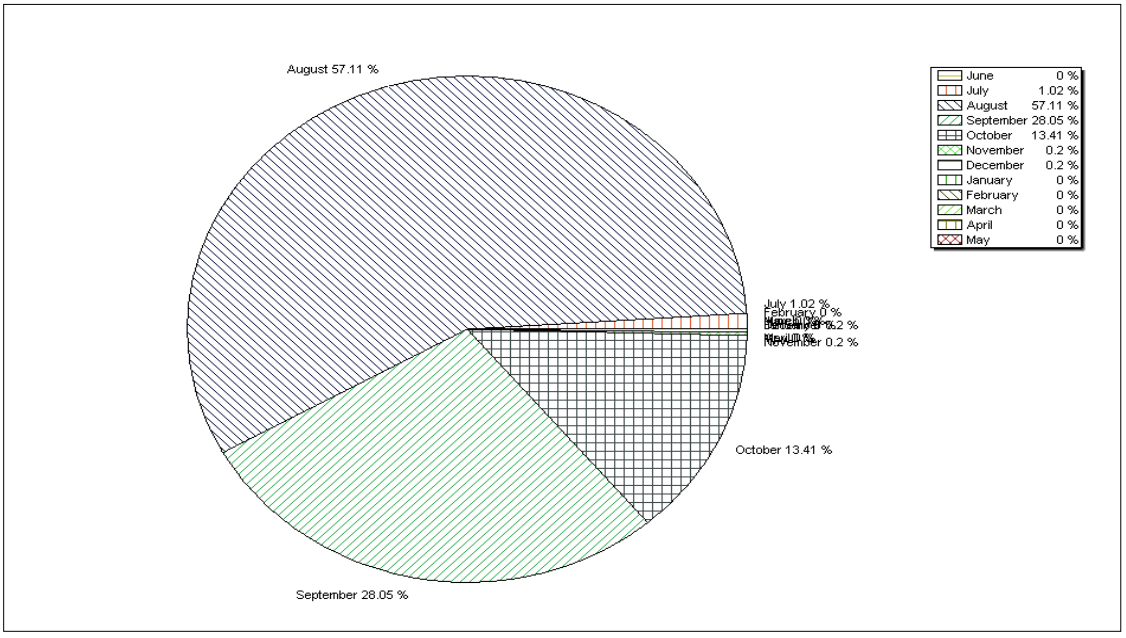
Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

Monthly Average Runoff based on period : 1992-2016



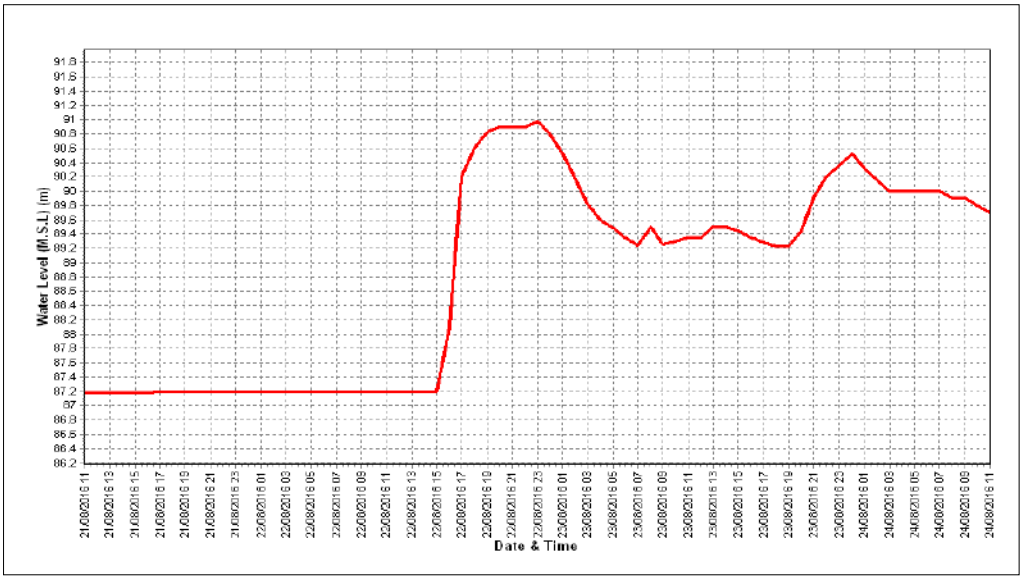
Monthly Runoff for the Year : 2016-2017



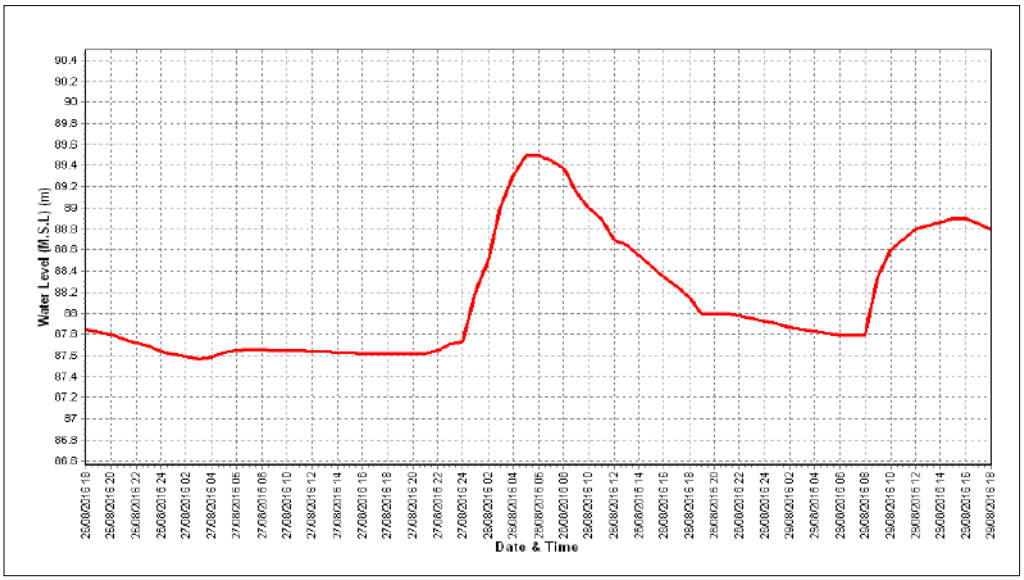
Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

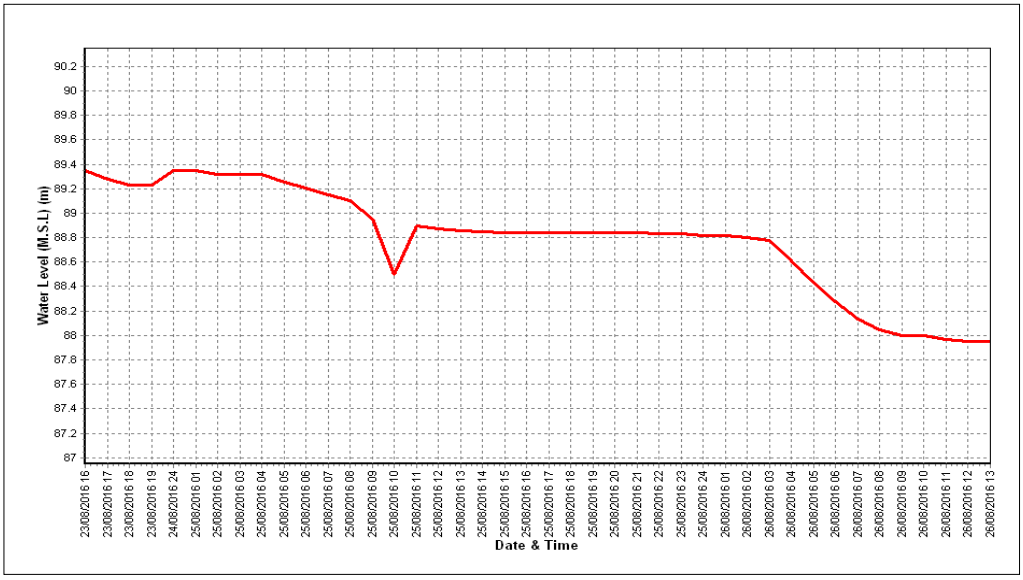
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-17

Site	**: Sabarmati at Kheroj**	**Code**	**: 01 02 12 003**
State	: Gujarat	District	Sabarkantha
Basin	: Sabarmati	Independent River	: Sabarmati
Tributary	: Sabarmati	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Sabarmati
Division	: Mahi Division, Gandhinagar	Sub-Division	: N.W.R.Sub Div., Himatnagar
Drainage Area	: 3650 Sq. Km.	Bank	: Left
Latitude	: 24°13'45"N	Longitude	: 73°00'26"E

Zero of Gauge (m)			
	: 0 (A)	01/01/1981	- 31/12/1987
	211.68 (m.s.l)	01/01/1988	- 30/06/1993
	210.5 (m.s.l)	01/07/1993	- 16/07/2003
	208 (m.s.l)	17/07/2003	-

	Opening Date	Closing Date
Gauge	: 01/06/1981	
Discharge	: 22/06/1992	
Sediment	: --	
Water Quality	: --	

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

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1992-1993	325.0	213.880	08/09/1992	0.000	River Dry	19/03/1993
1993-1994	653.4	215.180	17/07/1993	0.000	River Dry	26/01/1994
1994-1995	790.2	215.000	20/08/1994	0.000	211.830	03/04/1995
1995-1996	164.5	213.170	31/07/1995	0.000	211.600	31/01/1996
1996-1997	470.7	214.060	11/09/1996	0.000	River Dry	20/12/1996
1997-1998	401.0	213.475	25/06/1997	0.000	211.760	26/01/1998
1998-1999	229.3	211.680	27/08/1998	0.000	River Dry	23/05/1999
1999-2000	23.70	212.455	21/07/1999	0.000	River Dry	20/11/1999
2000-2001	30.63	212.500	02/07/2000	0.000	River Dry	29/01/2001
2001-2002	118.5	213.440	14/06/2001	0.000	River Dry	28/01/2002
2002-2003	148.5	212.800	02/09/2002	0.000	River Dry	24/11/2002
2003-2004	265.8	210.950	29/07/2003	0.000	River Dry	14/01/2004
2004-2005	87.18	210.650	08/08/2004	0.000	River Dry	09/05/2005
2005-2006	955.1	213.250	02/08/2005	0.000	River Dry	01/06/2005
2006-2007	1402	215.450	19/08/2006	0.000	River Dry	01/06/2006
2007-2008	619.4	212.850	09/07/2007	0.000	208.600	01/06/2007
2008-2009	205.3	210.875	12/08/2008	0.000	River Dry	01/06/2008
2009-2010	270.9	211.335	23/07/2009	0.000	River Dry	01/06/2009
2010-2011	224.03	211.115	31/08/2010	0.000	River Dry	01/06/2010
2011-2012	441.8	212.090	12/09/2011	0.000	River Dry	22/04/2012
2012-2013	451.3	212.260	08/09/2012	0.000	River Dry	01/06/2012

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

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

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
2013-2014	166.2	210.77	28/07/2013	0.000	River Dry	01/06/2013
2014-2015	240.3	210.84	10/09/2014	0.000	River Dry	01/06/2014
2015-2016	8351	215.05	29/07/2015	0.000	209.500	21/11/2015
2016-2017	1175	211.940	10/08/2016	0.000	River Dry	01/06/2016

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

Stage-Discharge Data for the period 2016 - 2017

Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

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	R.Dry	0.000	R.Dry	0.000	209.860	16.54	210.635	129.5	209.900	15.83	209.750	7.170 *
2	R.Dry	0.000	R.Dry	0.000	209.860	16.66	210.980	177.4	209.940	19.17 *	209.740	6.740 *
3	R.Dry	0.000	R.Dry	0.000	209.980	26.76	210.695	151.0	210.065	42.21	209.730	6.330 *
4	R.Dry	0.000	210.525	101.8	210.760	205.9 #	210.610	150.1 *	209.980	25.30	209.720	5.930 *
5	R.Dry	0.000	210.185	47.23	210.125	45.72	210.510	101.3	210.060	39.38	209.720	5.930 *
6	R.Dry	0.000	209.790	9.070 *	210.000	32.20	210.460	96.60	210.205	59.94	209.710	5.550 *
7	R.Dry	0.000	209.685	4.231	210.550	130.9 *	210.415	79.64	210.670	146.8	209.700	5.190 *
8	R.Dry	0.000	209.600	2.883	210.115	42.73	210.305	75.56	210.140	49.99	209.680	4.510 *
9	R.Dry	0.000	209.560	2.000	210.085	37.39	210.270	63.30	210.060	31.22 *	209.680	4.510 *
10	R.Dry	0.000	209.530	1.200 *	211.940	1175 #	210.250	62.48	210.020	34.64	209.670	4.200 *
11	R.Dry	0.000	209.500	0.209	211.370	482.2	210.210	52.28 *	209.980	22.75 *	209.670	4.200 *
12	R.Dry	0.000	209.725	6.057	210.870	196.0	210.180	49.80	209.950	20.03 *	209.660	3.900 *
13	R.Dry	0.000	209.800	10.80	210.580	138.7 #	210.160	44.45 *	209.920	18.60	209.660	3.900 *
14	R.Dry	0.000	210.170	45.62	210.420	95.20 *	210.125	40.07	209.910	16.64	209.660	3.900 *
15	R.Dry	0.000	209.840	13.67	210.340	76.83 *	210.100	41.88	209.890	15.37	209.650	3.610 *
16	R.Dry	0.000	209.720	7.617	210.245	72.49	210.085	35.58	209.870	13.08	209.650	3.610 *
17	R.Dry	0.000	209.670	4.200 *	210.180	65.03	210.070	36.63	209.870	13.08	209.640	3.340 *
18	R.Dry	0.000	209.630	4.841	210.135	45.37	210.060	31.22 *	209.860	12.50	209.640	3.340 *
19	R.Dry	0.000	209.610	3.404	210.090	43.78	210.040	29.36	209.850	12.84	209.640	3.340 *
20	R.Dry	0.000	209.600	3.002	210.080	37.75	210.030	30.03	209.840	10.94	209.640	3.340 *
21	R.Dry	0.000	209.580	1.067	210.090	34.86 *	210.040	30.12	209.830	10.60	209.640	3.340 *
22	R.Dry	0.000	209.560	0.844	211.850	988.7	210.010	25.84	209.820	10.10	209.640	3.340 *
23	R.Dry	0.000	209.540	1.340 *	211.380	762.6	210.115	47.32	209.810	10.14 *	209.640	3.340 *
24	R.Dry	0.000	209.530	1.200 *	211.415	777.2	210.020	35.65	209.800	9.281	209.640	3.340 *
25	R.Dry	0.000	209.520	1.070 *	211.160	418.5 *	209.980	22.75 *	209.800	8.819	209.630	3.090 *
26	R.Dry	0.000	210.085	38.08	211.000	404.7	209.960	21.05	209.790	7.904	209.630	3.090 *
27	R.Dry	0.000	209.780	9.859	210.865	180.0	209.940	20.06	209.780	8.517	209.630	3.090 *
28	R.Dry	0.000	209.785	10.32	210.850	245.2 *	209.930	18.49	209.780	7.710	209.650	3.610 *
29	R.Dry	0.000	209.810	11.33	210.700	111.7	209.920	18.30	209.770	6.506	209.650	3.610 *
30	R.Dry	0.000	210.095	37.60	210.695	116.3	209.910	16.45	209.770	8.080 *	209.650	3.610 *
31			209.860	13.17 *	210.670	120.5			209.760	5.995		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	209.839	24.06	210.327	173.0	210.513	108.7	210.104	46.45	209.710	5.606
II Ten-Daily	R.Dry	0.000	209.727	9.942	210.431	125.3	210.106	39.13	209.894	15.58	209.651	3.648
III Ten-Daily	R.Dry	0.000	209.740	11.44	210.970	378.2	209.982	25.60	209.792	8.514	209.640	3.346
Monthly												
Min.	R.Dry	0.000	209.500	0.209	209.860	16.54	209.910	16.45	209.760	5.995	209.630	3.090
Max.	R.Dry	0.000	210.525	101.8	211.940	1175	210.980	177.4	210.670	146.8	209.750	7.170
Mean	R.Dry	0.000	209.760	14.06	210.589	230.4	210.201	57.81	209.925	23.03	209.667	4.2

Annual Runoff in MCM = 912 Annual Runoff in mm = 250

Peak Observed Discharge = 1175 cumecs on 10/08/2016 Corres. Water Level :211.94 m

Lowest Observed Discharge = 0.000 cumecs on 06/03/2017 Corres. Water Level :209.34 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 Data for the period 2016 - 2017

Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	209.650	3.610 *	209.710	5.550 *	209.640	3.340 *	209.390	0.130 *	R.Dry	0.000	R.Dry	0.000
2	209.640	3.340 *	209.700	5.190 *	209.640	3.340 *	209.380	0.110 *	R.Dry	0.000	R.Dry	0.000
3	209.640	3.340 *	209.690	4.840 *	209.630	3.090 *	209.370	0.080 *	R.Dry	0.000	R.Dry	0.000
4	209.640	3.340 *	209.680	4.510 *	209.620	2.840 *	209.360	0.060 *	R.Dry	0.000	R.Dry	0.000
5	209.640	3.340 *	209.670	4.200 *	209.620	2.840 *	209.350	0.040 *	R.Dry	0.000	R.Dry	0.000
6	209.840	11.89 *	209.660	3.900 *	209.610	2.610 *	209.340	0.000	R.Dry	0.000	R.Dry	0.000
7	209.840	11.89 *	209.660	3.900 *	209.600	2.390 *	209.320	0.000	R.Dry	0.000	R.Dry	0.000
8	209.830	11.29 *	209.660	3.900 *	209.620	2.840 *	209.320	0.000	R.Dry	0.000	R.Dry	0.000
9	209.820	10.70 *	209.650	3.610 *	209.610	2.610 *	209.320	0.000	R.Dry	0.000	R.Dry	0.000
10	209.830	11.29 *	209.650	3.610 *	209.600	2.390 *	209.320	0.000	R.Dry	0.000	R.Dry	0.000
11	209.860	13.17 *	209.660	3.610 *	209.590	2.190 *	209.310	0.000	R.Dry	0.000	R.Dry	0.000
12	209.850	12.52 *	209.660	3.610 *	209.580	2.000 *	209.300	0.000	R.Dry	0.000	R.Dry	0.000
13	209.840	11.89 *	209.660	3.610 *	209.560	1.640 *	209.280	0.000	R.Dry	0.000	R.Dry	0.000
14	209.830	11.29 *	209.660	3.610 *	209.550	1.490 *	209.270	0.000	R.Dry	0.000	R.Dry	0.000
15	209.830	11.29 *	209.680	4.510 *	209.530	1.200 *	209.250	0.000	R.Dry	0.000	R.Dry	0.000
16	209.820	10.70 *	209.680	4.510 *	209.520	1.070 *	209.230	0.000	R.Dry	0.000	R.Dry	0.000
17	209.810	10.14 *	209.680	4.510 *	209.460	0.490 *	209.220	0.000	R.Dry	0.000	R.Dry	0.000
18	209.810	10.14 *	209.720	5.930 *	209.430	0.300 *	209.200	0.000	R.Dry	0.000	R.Dry	0.000
19	209.800	9.600 *	209.710	5.550 *	209.450	0.420 *	209.190	0.000	R.Dry	0.000	R.Dry	0.000
20	209.800	9.600 *	209.700	5.190 *	209.460	0.490 *	209.170	0.000	R.Dry	0.000	R.Dry	0.000
21	209.810	10.14 *	209.690	4.840 *	209.470	0.560 *	209.150	0.000	R.Dry	0.000	R.Dry	0.000
22	209.810	10.14 *	209.680	4.510 *	209.470	0.560 *	209.130	0.000	R.Dry	0.000	R.Dry	0.000
23	209.790	9.070 *	209.680	4.510 *	209.470	0.560 *	209.120	0.000	R.Dry	0.000	R.Dry	0.000
24	209.780	8.570 *	209.670	4.200 *	209.470	0.560 *	209.100	0.000	R.Dry	0.000	R.Dry	0.000
25	209.780	8.570 *	209.650	3.610 *	209.460	0.490 *	209.080	0.000	R.Dry	0.000	R.Dry	0.000
26	209.770	8.080 *	209.650	3.610 *	209.450	0.420 *	209.070	0.000	R.Dry	0.000	R.Dry	0.000
27	209.750	7.170 *	209.670	4.200 *	209.430	0.300 *	209.060	0.000	R.Dry	0.000	R.Dry	0.000
28	209.740	6.740 *	209.670	4.200 *	209.410	0.210 *	209.000	0.000	R.Dry	0.000	R.Dry	0.000
29	209.730	6.330 *	209.670	4.200 *			208.960	0.000	R.Dry	0.000	R.Dry	0.000
30	209.730	6.330 *	209.660	3.900 *			208.920	0.000	R.Dry	0.000	R.Dry	0.000
31	209.720	5.930 *	209.650	3.610 *			208.860	0.000			R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	209.737	7.403	209.673	4.321	209.619	2.829	209.347	0.042	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	209.825	11.03	209.681	4.464	209.513	1.129	209.242	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	209.765	7.915	209.667	4.126	209.454	0.458	209.041	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	209.640	3.340	209.650	3.610	209.410	0.210	208.860	0.000	R.Dry	0.000	R.Dry	0.000
Max.	209.860	13.17	209.720	5.930	209.640	3.340	209.390	0.130	R.Dry	0.000	R.Dry	0.000
Mean	209.775	8.756	209.674	4.298	209.534	1.544	209.205	0.014	R.Dry	0	R.Dry	0

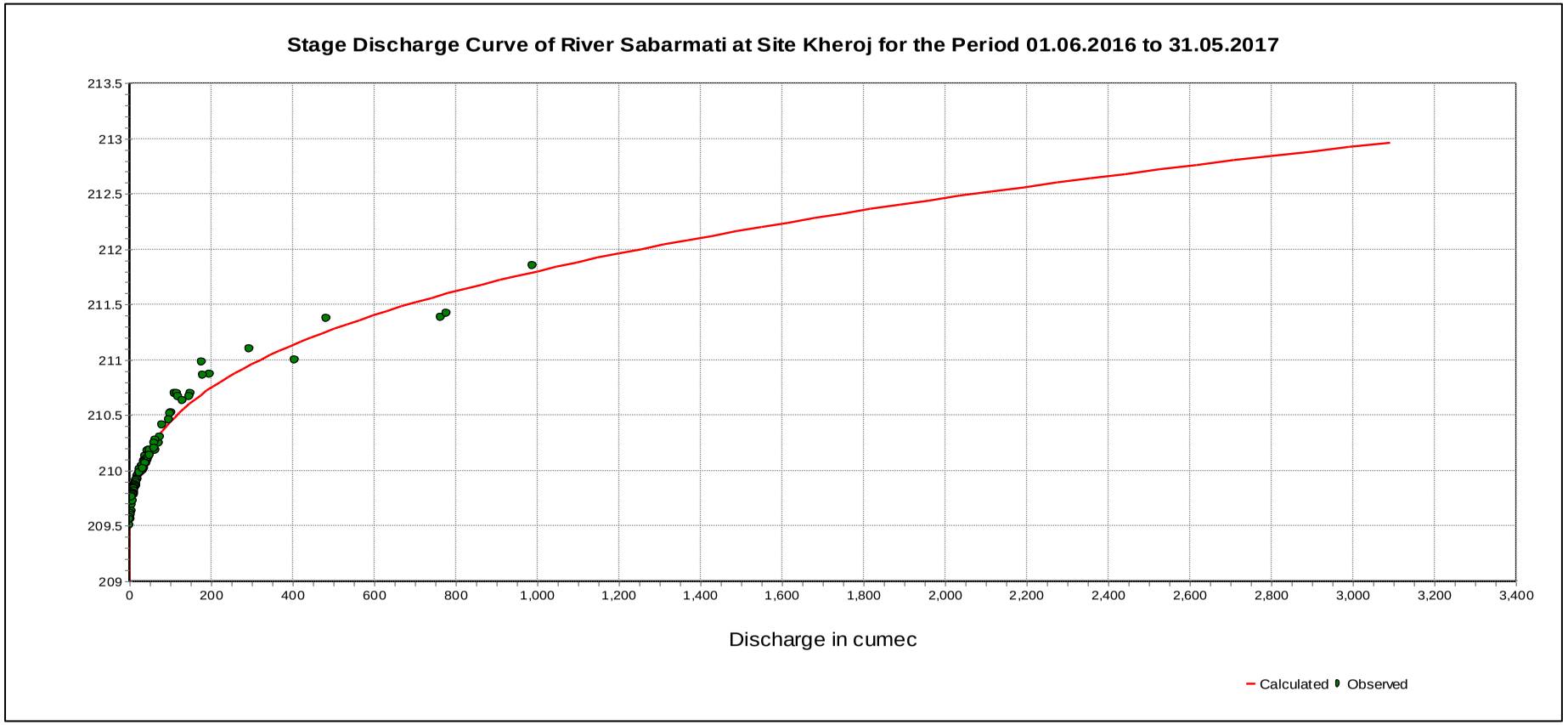
Peak Computed Discharge = 418.5 cumecs on 25/08/2016 **Corres. Water Level :211.16 m**

Lowest Computed Discharge = 0.040 cumecs on 05/03/2017 **Corres. Water Level :209.35 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



Procedure - Standard

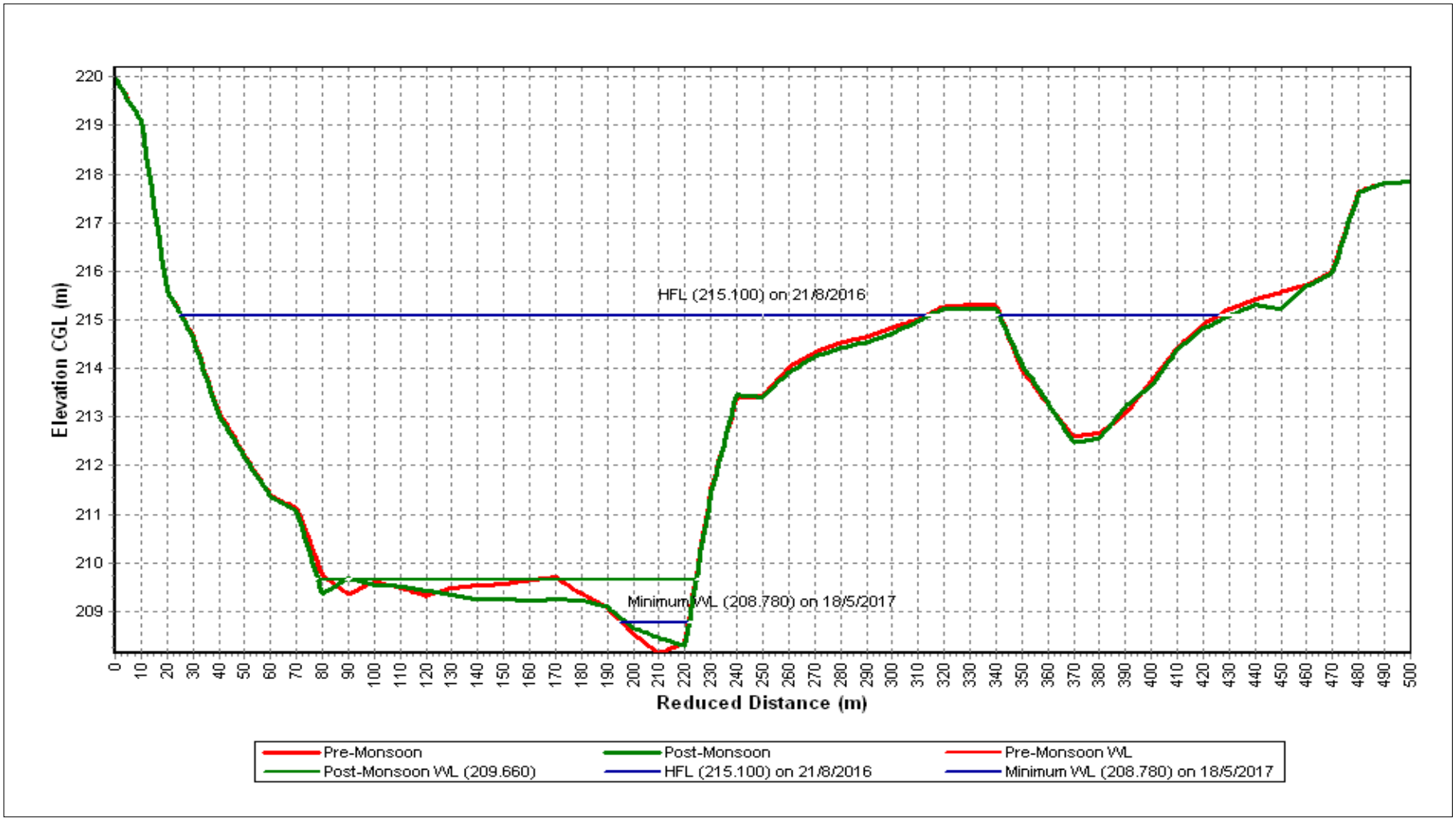
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
209	213	-209.26	3.001	60.982

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

Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**



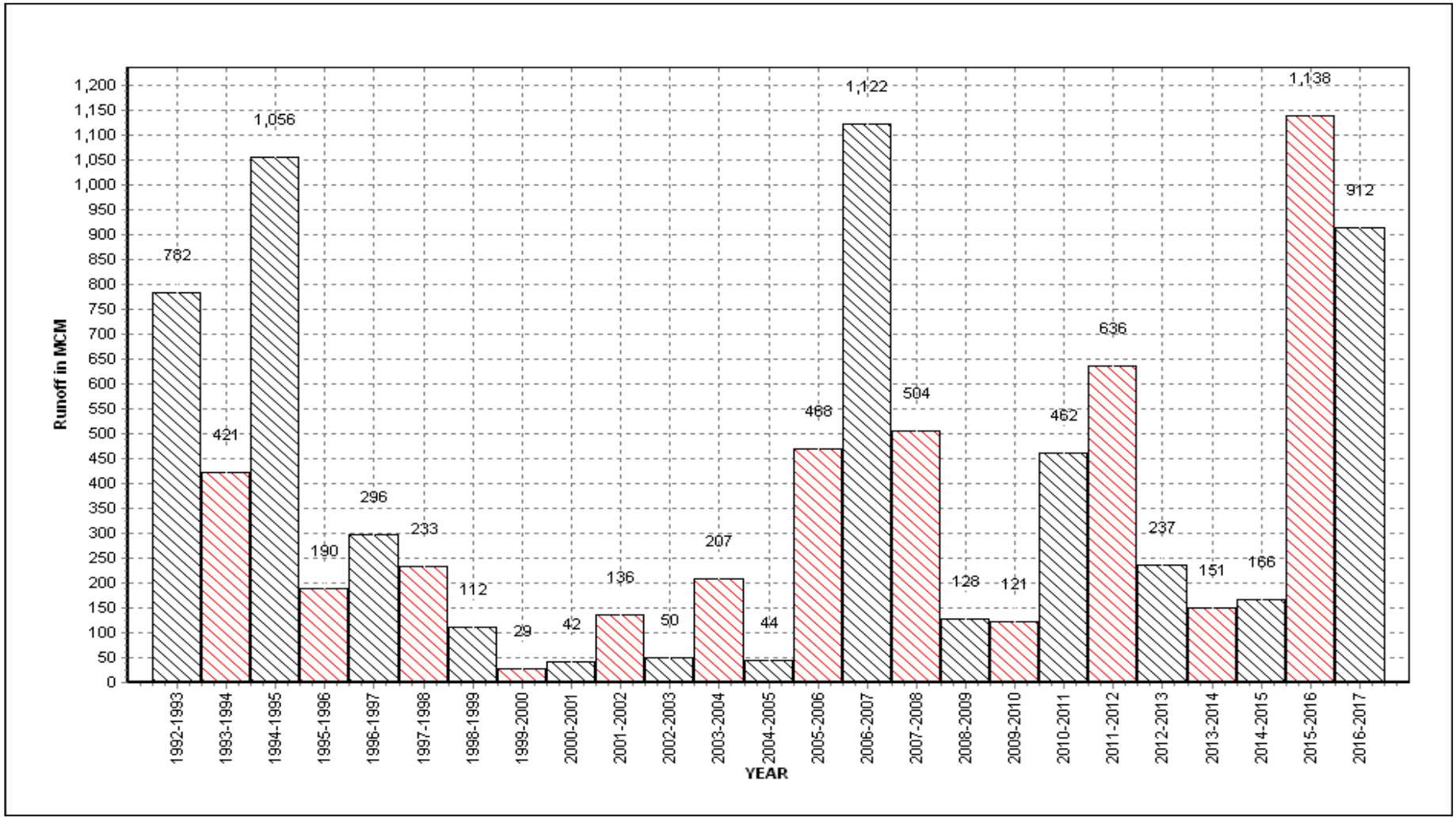
HFL obsereved - 218.000m on 19.08.2006 at 1600 hrs

HFL on grapph shows Max Water Level during 2016-17

Annual Runoff Values for the period: 1992 - 2017

Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

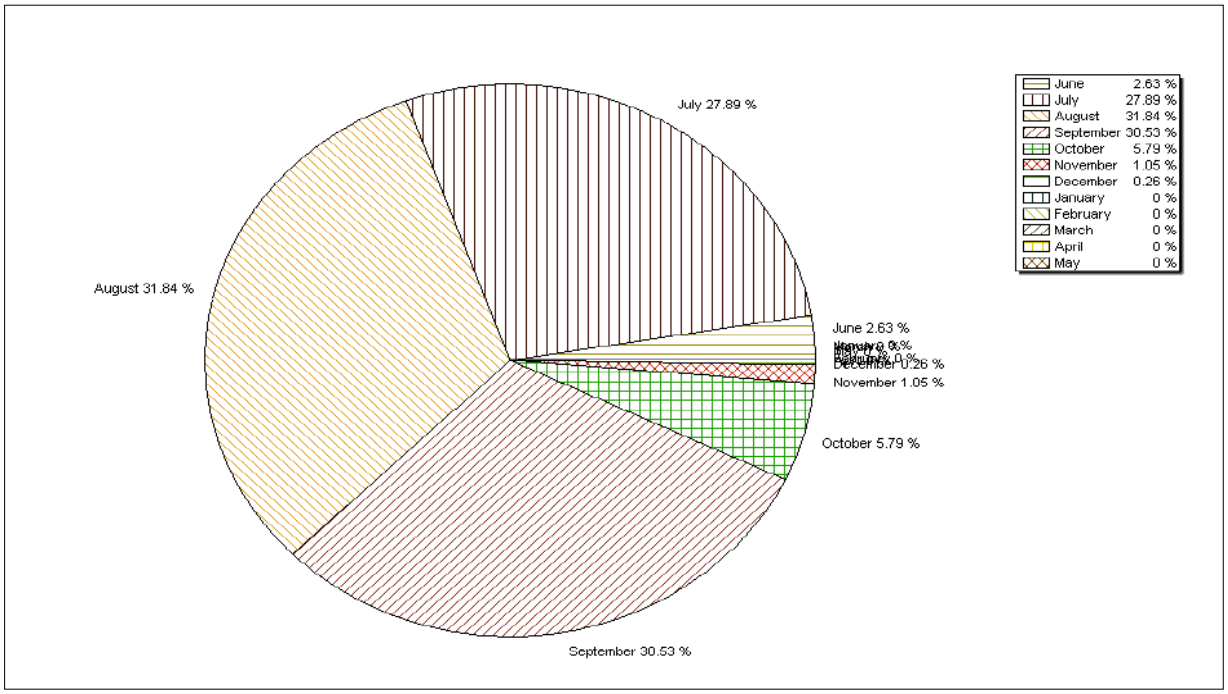


Note: Missing values have not been considered while arriving at Annual Runoff

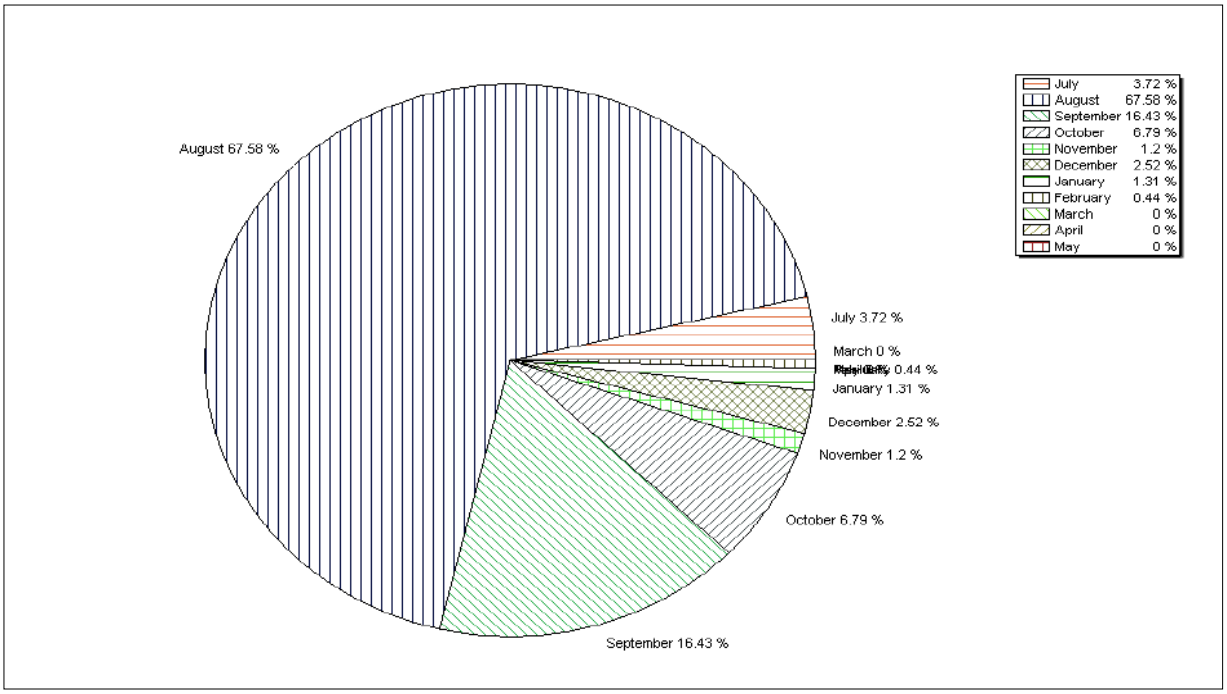
Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

Monthly Average Runoff based on period : 1992-2016

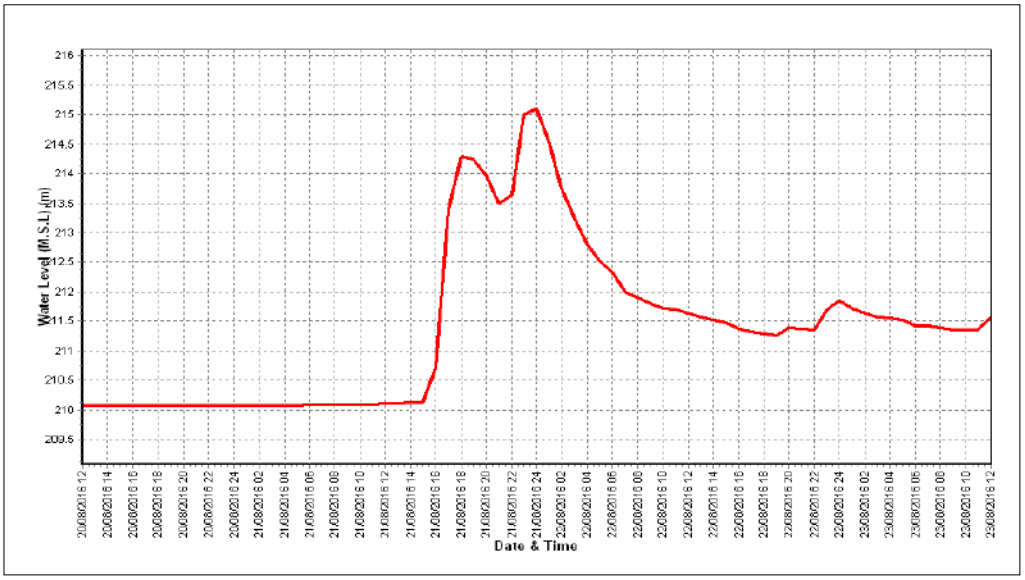


Monthly Runoff for the Year : 2016-2017

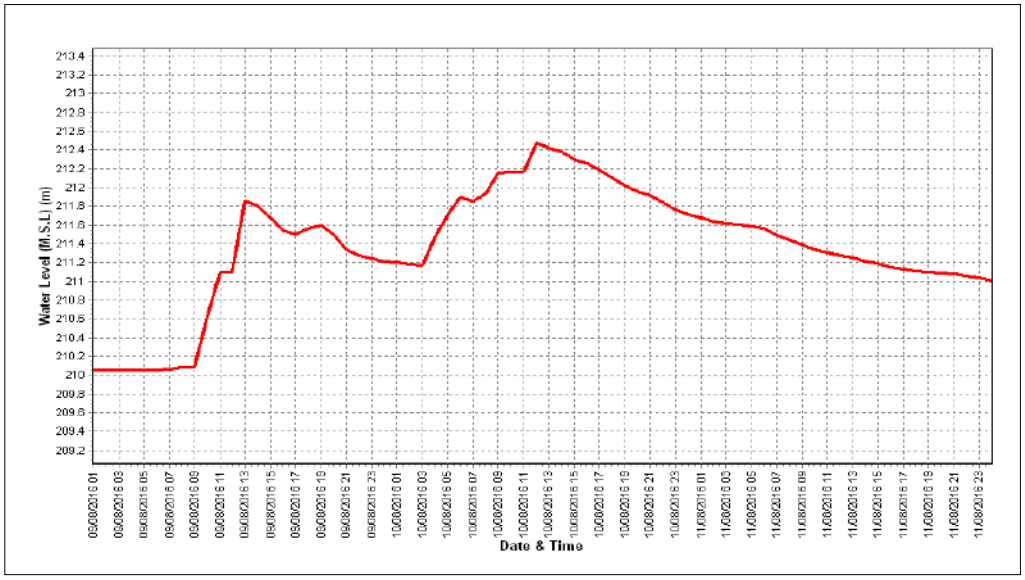


Station Name : Sabarmati at Kheroj (01 02 12 003) **Division : Mahi Division, Gandhinagar**
Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

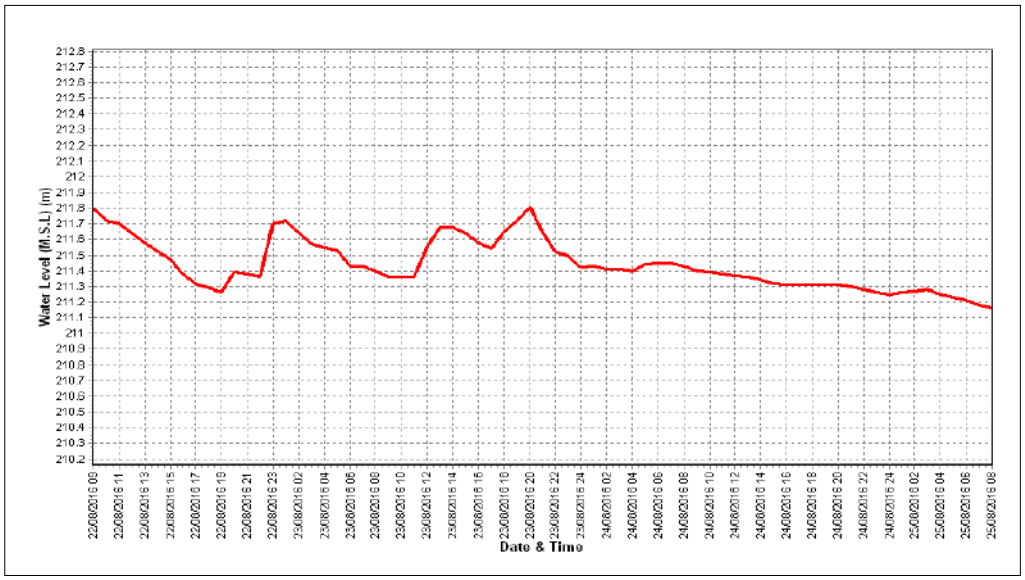
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Wakal at Kotra(Jotasan)**	**Code**	:	**01 02 12 001**
State	:	Gujarat	District		Sabarkantha
Basin	:	Sabarmati	Independent River	:	Sabarmati
Tributary	:	Wakal	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Wakal
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	N.W.R.Sub Div., Himatnagar
Drainage Area	:	1421 Sq. Km.	Bank	:	Left
Latitude	:	24°21'20"N	Longitude	:	73°10'05" E

Zero of Gauge (m)	:	0 (A)(Kotra)	01/06/1979	- 31/05/1987
		200 (m.s.l)(Kotra)	01/06/1987	- 03/08/1995
		199 (m.s.l)(Jotasan)	04/08/1995	- 31/05/2002
		285 (m.s.l)(Jotasan)	01/06/2002	-
		Opening Date	Closing Date	
Gauge	:	03/07/1979(Kotra)		
		14/06/95(Jotasan)		
Discharge	:	14/06/1995(Jotasan)		
Sediment	:	--		
Water Quality	:	--		

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1995-1996	45.00	200.380	03/09/1995	0.000	River Dry	26/01/1996
1996-1997	49.60	200.820	11/09/1996	0.000	199.040	26/01/1997
1997-1998	49.20	200.850	02/08/1997	0.000	River Dry	01/06/1997
1998-1999	19.60	200.500	19/09/1998	0.000	199.090	29/10/1998
1999-2000	24.30	200.380	20/07/1999	0.000	River Dry	02/01/2000
2000-2001	14.65	200.830	14/07/2000	0.000	River Dry	04/12/2000
2001-2002	29.40	200.340	12/08/2001	0.000	River Dry	20/01/2002
2002-2003	49.00	287.590	02/09/2002	0.000	River Dry	10/05/2003
2003-2004	62.00	287.500	29/07/2003	0.000	River Dry	03/04/2004
2004-2005	82.50	287.360	08/08/2004	0.000	River Dry	06/02/2005
2005-2006	93.13	287.590	26/09/2005	0.000	River Dry	01/06/2005
2006-2007	1340	291.550	20/08/2006	0.000	River Dry	01/06/2006
2007-2008	267.1	288.325	09/07/2007	0.000	River Dry	01/06/2007
2008-2009	80.03	287.435	05/08/2008	0.000	River Dry	01/06/2008
2009-2010	113.7	287.835	23/07/2009	0.000	River Dry	01/06/2009
2010-2011	210.1	288.325	25/07/2010	0.000	River Dry	01/06/2010
2011-2012	291.7	288.700	12/09/2011	0.000	River Dry	01/06/2011
2012-2013	181.0	288.380	08/09/2012	0.000	River Dry	01/06/2012
2013-2014	80.41	287.65	29/09/2013	0.000	River Dry	01/06/2013
2014-2015	424.6	288.05	09/09/2014	0.000	River Dry	01/06/2014
2015-2016	1059	290.87	29/07/2015	0.000	River Dry	01/06/2015
2016-2017	924.2	289.22	09/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**

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	R.DRY	0.000	R.DRY	0.000	287.130	17.03	287.780	99.09	287.150	20.00	286.950	8.850 *
2	R.DRY	0.000	R.DRY	0.000	287.210	24.96	287.650	90.08	287.180	24.46 *	286.940	8.380 *
3	R.DRY	0.000	R.DRY	0.000	287.180	21.72	287.440	76.68	287.230	36.80	286.940	8.380 *
4	R.DRY	0.000	286.660	0.920 #	288.130	237.1 #	287.370	45.78 *	287.180	26.74	286.930	7.940 *
5	R.DRY	0.000	287.200	24.06	287.260	29.36	287.290	47.46	287.200	31.97	286.930	7.940 *
6	R.DRY	0.000	286.925	6.530	287.195	21.81	287.270	45.38	287.360	63.52	286.920	7.500 *
7	R.DRY	0.000	286.840	4.570 #	287.170	23.57 *	287.300	47.64	287.600	84.06 #	286.920	7.500 *
8	R.DRY	0.000	286.690	1.290 #	287.260	28.93	287.300	47.02	287.220	34.83	286.920	7.500 *
9	R.DRY	0.000	286.650	1.051	289.220	924.2	287.270	45.61	287.190	25.38 *	286.910	7.090 *
10	R.DRY	0.000	286.640	0.710 *	289.125	852.4	287.260	41.73	287.170	26.04	286.900	6.680 *
11	R.DRY	0.000	287.170	21.08	288.530	426.4 #	287.250	31.34 *	287.160	22.69 *	286.900	6.680 *
12	R.DRY	0.000	286.875	5.129	287.570	78.91	287.230	36.93	287.160	22.69 *	286.900	6.680 *
13	R.DRY	0.000	286.960	8.787	287.430	59.53	287.140	18.96	287.140	18.96	286.890	6.300 *
14	R.DRY	0.000 *	287.225	25.88	287.370	45.78 *	287.210	33.87	287.130	17.25	286.890	6.300 *
15	R.DRY	0.000	287.030	10.26	287.270	33.50 *	287.200	32.50	287.120	16.83	286.880	5.920 *
16	R.DRY	0.000	286.910	5.642	287.210	29.63	287.190	30.70	287.110	18.64 *	286.880	5.920 *
17	R.DRY	0.000	286.840	4.570 *	287.210	29.25	287.180	30.68	287.100	14.62	286.880	5.920 *
18	R.DRY	0.000	286.760	2.922	287.200	31.47	287.180	24.46 *	287.090	14.06	286.870	5.570 *
19	R.DRY	0.000	286.740	2.290	287.200	27.87	287.170	26.95	287.080	13.28	286.870	5.570 *
20	R.DRY	0.000	286.740	2.141	287.190	26.67	287.190	30.67	287.070	12.80	286.870	5.570 *
21	R.DRY	0.000	286.710	2.108	287.190	25.38 *	287.180	28.26	287.060	11.58	286.870	5.570 *
22	R.DRY	0.000	286.690	1.728	288.570	443.7	287.170	26.46	287.050	10.78	286.870	5.570 *
23	R.DRY	0.000	286.670	1.406	288.635	547.9	287.310	47.81	287.040	13.78 *	286.860	5.570 *
24	R.DRY	0.000	286.670	1.030 *	288.420	367.2 #	287.180	27.55	287.030	10.11	286.860	5.220 *
25	R.DRY	0.000	286.720	2.282	288.040	203.9 #	287.170	23.57 *	287.020	9.514	286.860	5.220 *
26	R.DRY	0.000	287.080	12.89	287.880	152.5 #	287.160	22.07	287.010	8.653	286.860	5.220 *
27	R.DRY	0.000	287.030	10.27	287.800	130.3 #	287.150	20.80	287.000	8.174	286.860	5.220 *
28	R.DRY	0.000	287.195	23.57	287.760	120.0 *	287.140	19.87	286.990	7.868	286.860	5.220 *
29	R.DRY	0.000	287.145	18.52	287.730	112.6 #	287.130	18.82	286.980	7.289	286.860	5.220 *
30	R.DRY	0.000	287.260	27.65	287.620	88.11 #	287.120	17.67	286.970	9.830 *	286.860	5.220 *
31			287.230	29.26 *	287.510	67.31 #			286.960	6.866		
Ten-Daily Mean												
I Ten-Daily	R.DRY	0.000	286.801	5.590	287.688	218.1	287.393	58.65	287.248	37.38	286.926	7.776
II Ten-Daily	R.DRY	0.000	286.925	8.870	287.418	78.90	287.194	29.70	287.116	17.18	286.883	6.043
III Ten-Daily	R.DRY	0.000	286.945	11.88	287.923	205.3	287.171	25.29	287.010	9.496	286.862	5.325
Monthly												
Min.	R.DRY	0.000	286.640	0.710	287.130	17.03	287.120	17.67	286.960	6.866	286.860	5.220
Max.	R.DRY	0.000	287.260	29.26	289.220	924.2	287.780	99.09	287.600	84.06	286.950	8.850
Mean	R.DRY	0.000	286.902	9.234	287.684	168.7	287.253	37.88	287.121	20.97	286.890	6.381

Annual Runoff in MCM = 673 Annual Runoff in mm = 474

Peak Observed Discharge = 924.2 cumecs on 09/08/2016 Corres. Water Level :289.22 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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 Data for the period 2016 - 2017

Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	286.860	5.220 *	286.800	3.440 *	286.730	1.920 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
2	286.860	5.220 *	286.800	3.440 *	286.730	1.920 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
3	286.860	5.220 *	286.790	3.190 *	286.730	1.920 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
4	286.860	5.220 *	286.790	3.190 *	286.730	1.920 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
5	286.850	4.890 *	286.780	2.950 *	286.720	1.750 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
6	286.850	4.890 *	286.780	2.950 *	286.720	1.750 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
7	286.850	4.890 *	286.770	2.720 *	286.720	1.750 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
8	286.850	4.890 *	286.770	2.720 *	286.720	1.750 *	286.700	1.430 *	286.680	1.160 *	R.DRY	0.000
9	286.850	4.890 *	286.760	2.500 *	286.720	1.750 *	286.690	1.290 *	286.680	1.160 *	R.DRY	0.000
10	286.850	4.890 *	286.760	2.500 *	286.720	1.750 *	286.690	1.290 *	286.680	1.160 *	R.DRY	0.000
11	286.850	4.890 *	286.750	2.300 *	286.720	1.750 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
12	286.850	4.890 *	286.750	2.300 *	286.720	1.750 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
13	286.850	4.890 *	286.750	2.300 *	286.720	1.750 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
14	286.850	4.890 *	286.740	2.110 *	286.720	1.750 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
15	286.840	4.570 *	286.680	1.160 *	286.720	1.750 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
16	286.840	4.570 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
17	286.840	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
18	286.840	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.670	1.030 *	R.DRY	0.000
19	286.840	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.660	0.920 *	R.DRY	0.000
20	286.830	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.660	0.920 *	R.DRY	0.000
21	286.830	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.660	0.920 *	R.DRY	0.000
22	286.830	4.270 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.650	0.810 *	R.DRY	0.000
23	286.820	3.980 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	286.650	0.810 *	R.DRY	0.000
24	286.820	3.980 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	R.DRY	0.000	R.DRY	0.000
25	286.820	3.980 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	R.DRY	0.000	R.DRY	0.000
26	286.820	3.980 *	286.740	2.110 *	286.710	1.590 *	286.690	1.290 *	R.DRY	0.000	R.DRY	0.000
27	286.810	3.700 *	286.730	1.920 *	286.710	1.590 *	286.680	1.160 *	R.DRY	0.000	R.DRY	0.000
28	286.810	3.700 *	286.730	1.920 *	286.710	1.590 *	286.680	1.160 *	R.DRY	0.000	R.DRY	0.000
29	286.810	3.700 *	286.730	1.920 *			286.680	1.160 *	R.DRY	0.000	R.DRY	0.000
30	286.810	3.700 *	286.730	1.920 *			286.680	1.160 *	R.DRY	0.000	R.DRY	0.000
31	286.810	3.700 *	286.730	1.920 *			286.680	1.160 *			R.DRY	0.000
Ten-Daily Mean												
I Ten-Daily	286.854	5.022	286.780	2.960	286.724	1.818	286.698	1.402	286.680	1.160	R.DRY	0.000
II Ten-Daily	286.843	4.578	286.737	2.072	286.715	1.670	286.690	1.290	286.668	1.008	R.DRY	0.000
III Ten-Daily	286.817	3.905	286.735	2.024	286.710	1.590	286.685	1.231	286.653	0.847	R.DRY	0.000
Monthly												
Min.	286.810	3.700	286.680	1.160	286.710	1.590	286.680	1.160	286.650	0.810	R.DRY	0.000
Max.	286.860	5.220	286.800	3.440	286.730	1.920	286.700	1.430	286.680	1.160	R.DRY	0.000
Mean	286.837	4.483	286.750	2.341	286.717	1.7	286.691	1.305	286.671	1.053	R.DRY	0.000

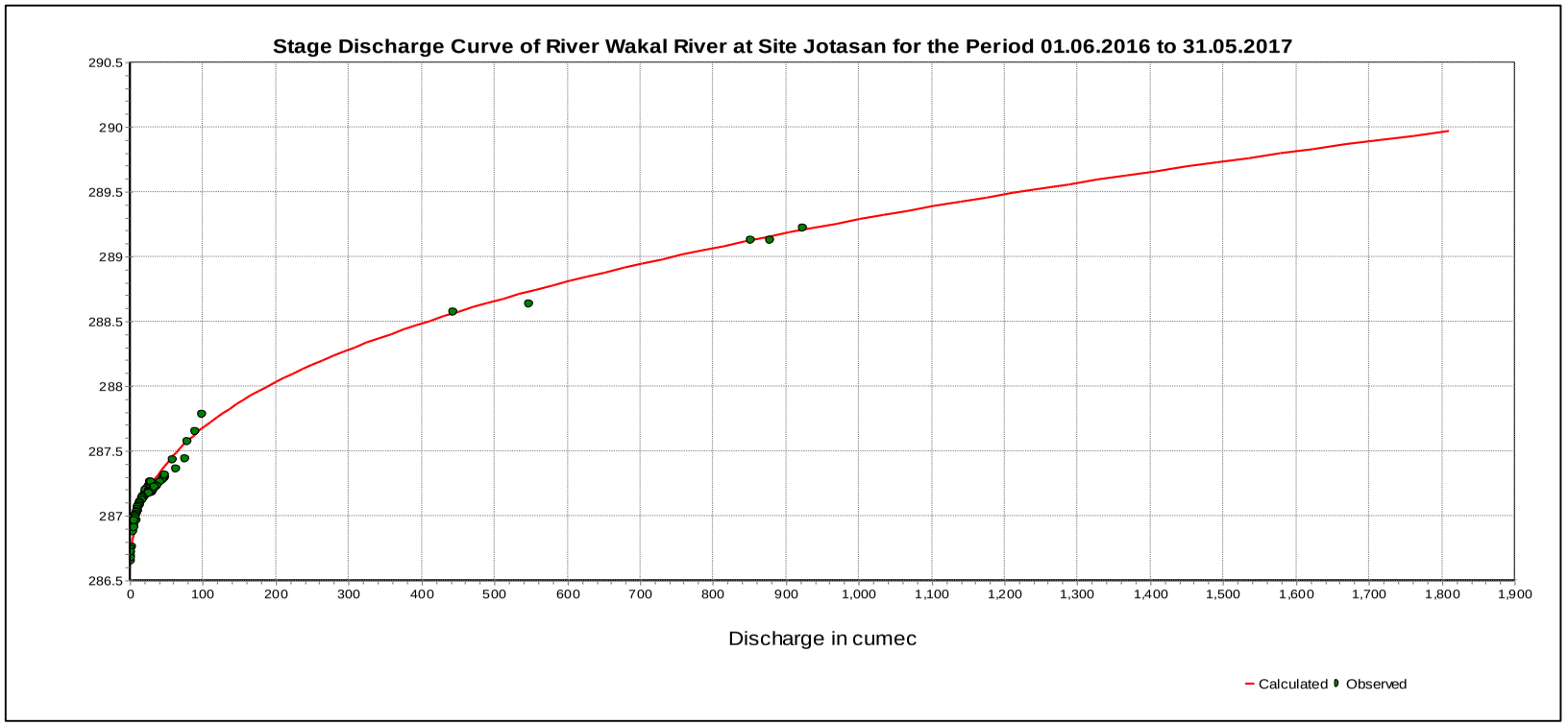
Peak Computed Discharge = 120.0 cumecs on 28/08/2016 Corres. Water Level :287.76 m

Lowest Computed Discharge = 0.000 cumecs on 14/06/2016

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



Procedure : Standard

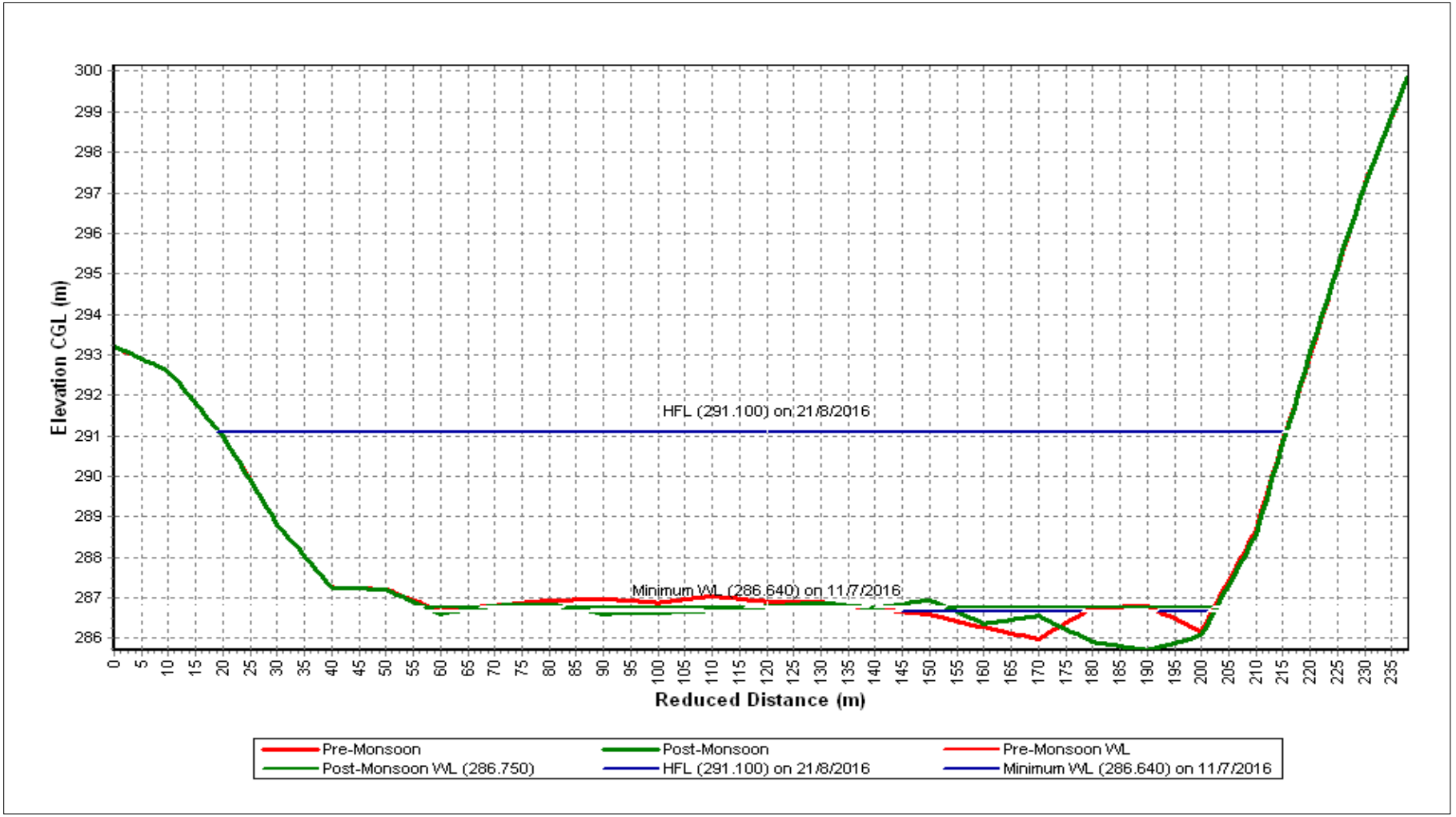
Equation type: Power $Q=(a+h)^{b}*c$

LB	UB	a	b	c
286.6	290	-286.43	2.776	54.361

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

Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**



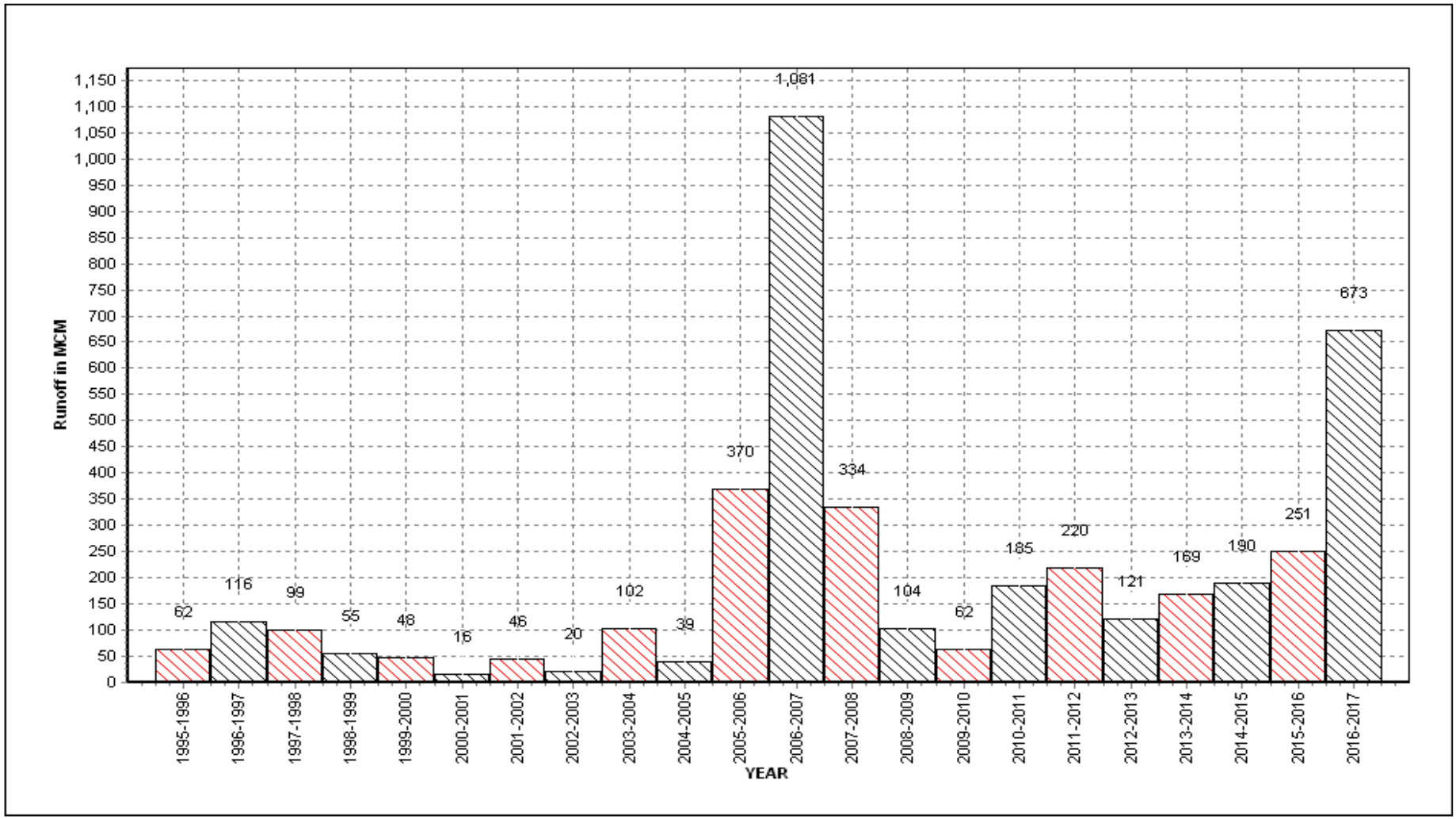
Historic Flood Level-291.600m on 20.08.2006 at 0700hrs

Note: HFL marked on graph denotes Maximum WaterLevel observed during the Water Year 2016-17

Annual Runoff Values for the period: 1995 - 2017

Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**

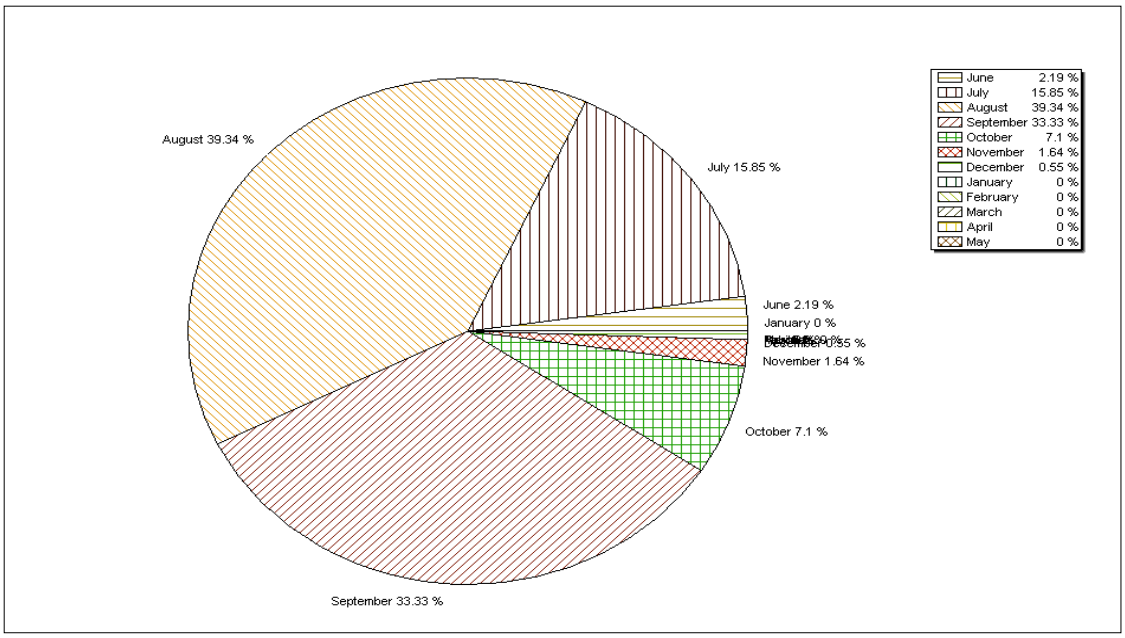


Note: Missing values have not been considered while arriving at Annual Runoff

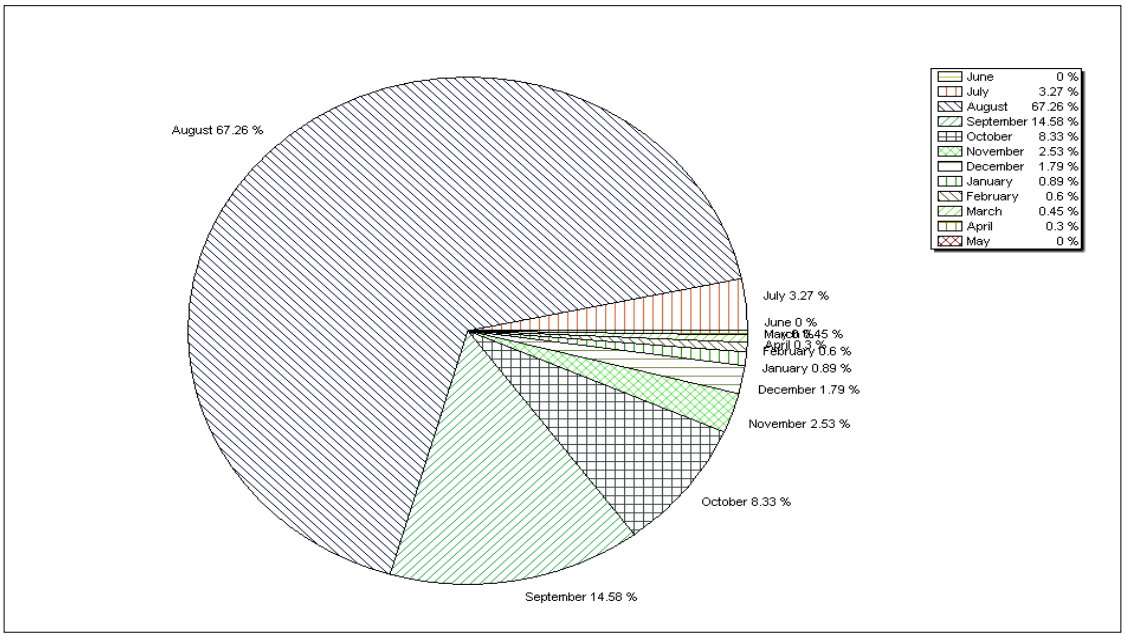
Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**

Monthly Average Runoff based on period : 1995-2016



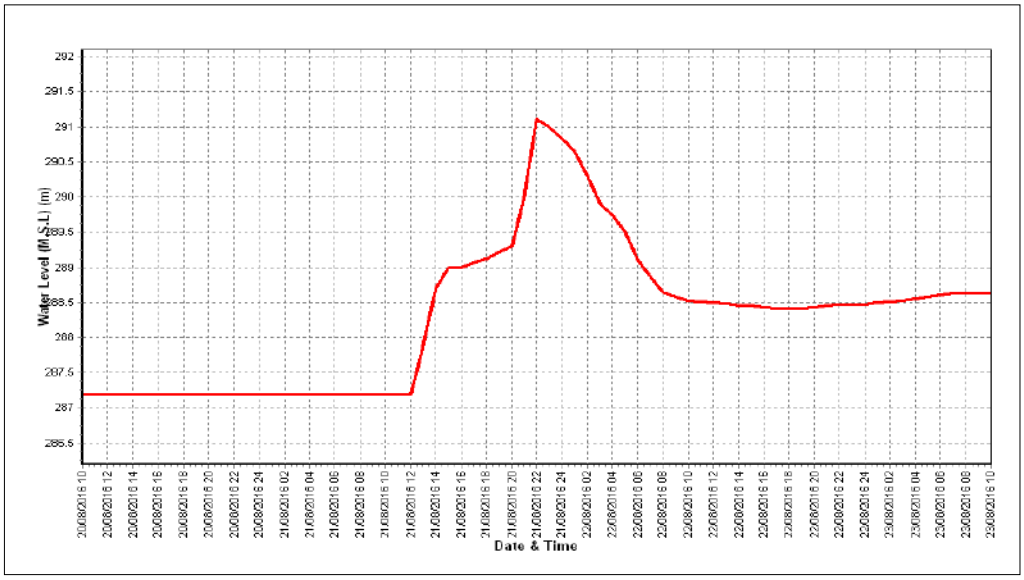
Monthly Runoff for the Year : 2016-2017



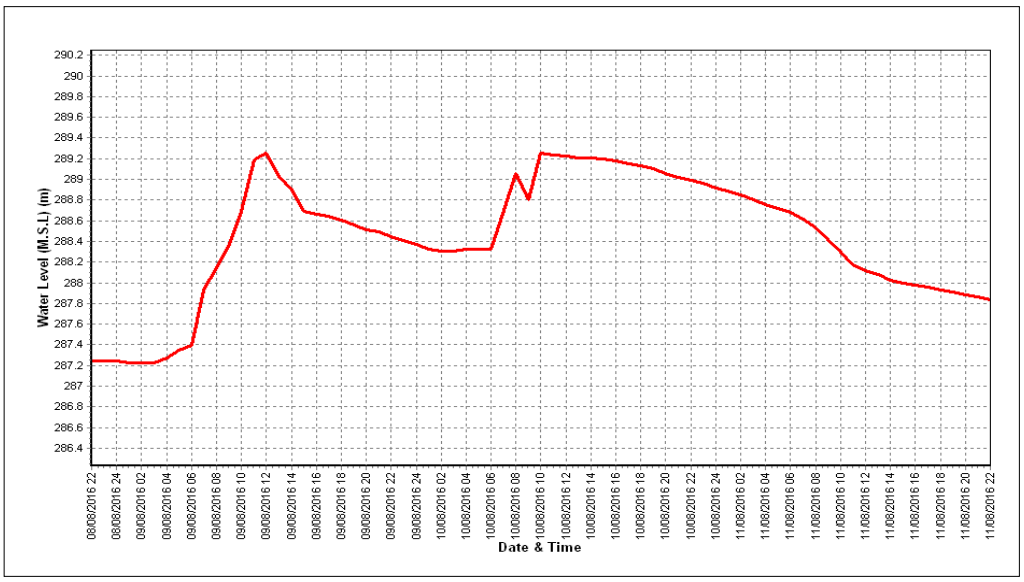
Station Name : Wakal at Kotra(Jotasan) (01 02 12 001) **Division : Mahi Division, Gandhinagar**

Local River : Wakal **Sub-Division : N.W.R.Sub Div., Himatnagar**

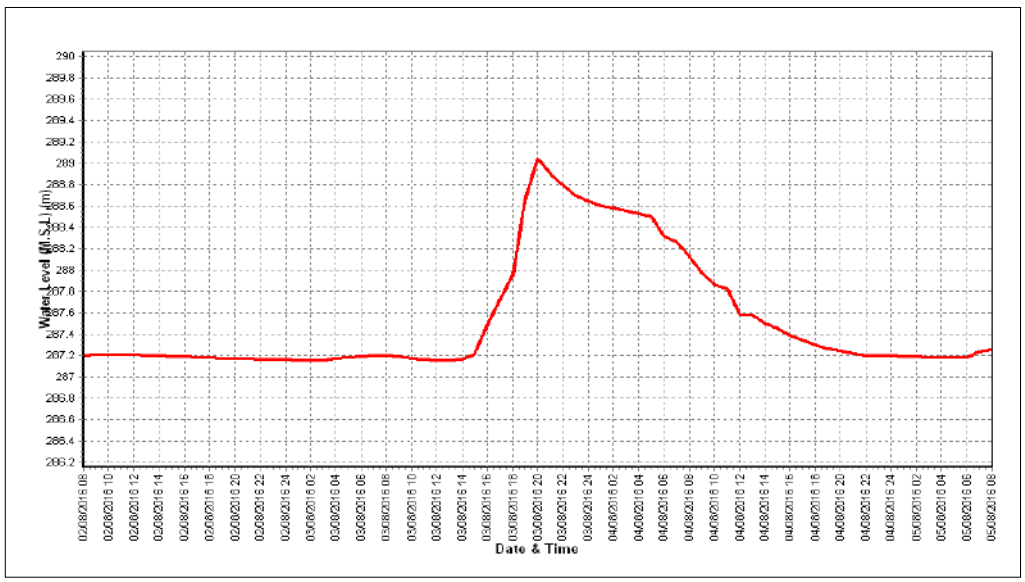
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Luni at Gandhav**	**Code**	:	**01 02 01 002**
State	:	Rajasthan	District		Badmer
			Independent		
Basin	:	WFR of Kach.-Saur. & Luni	River	:	Luni
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Luni
Division	:	Mahi Division Gandhinagar	Sub Division	:	Banas-Luni Sub Div Palanpur
Drainage Area	:	32010 Sq. Km.	Bank	:	
Latitude	:	24°59'22"	Longitude	:	71°40'47"
Zero of Gauge (m)	:	31.000	24/06/1974	-	
		Opening Date	Closing Date		
Gauge	:	24/06/1974			
Discharge	:	24/06/1974			
Sediment	:				
Water Quality	:				

Annual Maximum / Minimum discharge with mean WL during observation

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1974-1975	River Dry					
1975-1976	813.8	35.532	18/09/1975	0.000	River Dry	16/02/1976
1976-1977	1116	35.720	17/08/1976	0.000	River Dry	02/03/1977
1977-1978	562.1	35.540	04/08/1977	0.000	River Dry	27/01/1978
1978-1979	207.0	35.000	02/09/1978	0.000	River Dry	25/01/1979
1979-1980	4300	38.880	19/07/1979	0.000	River Dry	26/01/1980
1980-1981	95.00	34.840	04/08/1980	0.000	River Dry	26/01/1981
1981-1982	6.000	31.905	28/07/1981	0.000	River Dry	25/01/1982
1982-1983	138.0	33.150	22/08/1982	0.000	River Dry	25/01/1983
1983-1984	1655	34.855	29/07/1983	0.000	River Dry	27/02/1984
1986-1987	1.100	32.455	28/07/1986	0.000	River Dry	25/01/1987
1987-1988	River Dry					
1988-1989	River Dry					
1989-1990	River Dry					
1990-1991	4191	37.475	07/07/1990	0.000	River Dry	18/05/1991
1991-1992	3.102	31.650	03/08/1991	0.000	31.345	22/01/1992
1992-1993	1761	35.200	09/09/1992	0.000	River Dry	02/04/1993
1993-1994	310.2	33.450	19/07/1993	0.000	River Dry	09/05/1994
1994-1995	407.1	33.140	23/08/1994	0.000	River Dry	07/04/1995
1995-1996	1505	34.200	28/07/1995	0.000	River Dry	30/01/1996
1996-1997	51.80	32.740	23/08/1996	0.000	River Dry	25/01/1997
1997-1998	531.2	32.645	29/08/1997	0.000	River Dry	12/01/1998
1998-1999	43.75	32.550	11/06/1998	0.000	River Dry	25/01/1999
1999-2000	130.6	34.300	04/08/1999	0.000	River Dry	26/01/2000
2000-2001	7.580	32.140	15/07/2000	0.000	River Dry	25/01/2001
2001-2002	545.5	34.410	13/07/2001	0.000	River Dry	01/05/2002
2002-2003	River Dry					
2003-2004	9.697	32.690	26/07/2003	0.000	River Dry	26/01/2004
2004-2005	2.338	32.320	17/07/2004	0.000	River Dry	25/05/2005
2005-2006	River Dry					
2006-2007	River Dry					
2007-2008	1236*	35.400	09/07/2007	0.000	River Dry	01/06/2007
2008-2009	River Dry					
2009-2010	0	32.0	10/09/2009	0.000	River Dry	01/06/2009
2010-2011	0	32.56	22/10/2010	0.000	River Dry	01/06/2010
2011-2012	River Dry					
2012-2013	0	33.99	15/08/2012	0.000	River Dry	01/06/2012
2013-2014	0	32.7	01/06/2013	0.000	River Dry	14/06/2013
2014-2015	0	32.68	05/09/2014	0.000	River Dry	01/06/2014
2015-2016	416*	34.255	28/07/2015	0.000	32.5	10/08/2015
2016-2017	160.7	33.855	08/09/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	33.610	37.38 *	R.DRY	0.000	R.DRY	0.000
2	R.DRY	0.000	R.DRY	0.000	R.DRY	0.001	33.550	20.45 *	R.DRY	0.000	R.DRY	0.000
3	R.DRY	0.000	R.DRY	0.000	R.DRY	0.002	33.520	13.79 *	R.DRY	0.000	R.DRY	0.000
4	R.DRY	0.000	R.DRY	0.000	R.DRY	0.003	33.480	6.871 *	R.DRY	0.000	R.DRY	0.000
5	R.DRY	0.000	R.DRY	0.000	R.DRY	0.004	33.570	25.56 *	R.DRY	0.000	R.DRY	0.000
6	R.DRY	0.000	R.DRY	0.000	R.DRY	0.005	33.900	183.9 *	R.DRY	0.000	R.DRY	0.000
7	R.DRY	0.000	R.DRY	0.000	R.DRY	0.006	33.885	158.3	R.DRY	0.000	R.DRY	0.000
8	R.DRY	0.000	R.DRY	0.000	R.DRY	0.007	33.855	160.7	R.DRY	0.000	R.DRY	0.000
9	R.DRY	0.000	R.DRY	0.000	R.DRY	0.008	33.810	149.6	R.DRY	0.000	R.DRY	0.000
10	R.DRY	0.000	R.DRY	0.000	R.DRY	0.009	33.780	140.1	R.DRY	0.000	R.DRY	0.000
11	R.DRY	0.000	R.DRY	0.000	R.DRY	0.010	33.750	125.4	R.DRY	0.000	R.DRY	0.000
12	R.DRY	0.000	R.DRY	0.000	R.DRY	0.011	33.720	66.73	R.DRY	0.000	R.DRY	0.000
13	R.DRY	0.000	R.DRY	0.000	R.DRY	0.012	33.690	52.97	R.DRY	0.000	R.DRY	0.000
14	R.DRY	0.000	R.DRY	0.000	R.DRY	0.013	33.665	44.83	R.DRY	0.000	R.DRY	0.000
15	R.DRY	0.000	R.DRY	0.000	34.800	1263 *	33.635	35.09	R.DRY	0.000	R.DRY	0.000
16	R.DRY	0.000	R.DRY	0.000	35.850	3628 *	33.550	27.86	R.DRY	0.000	R.DRY	0.000
17	R.DRY	0.000	R.DRY	0.000	35.210	2049 *	33.250	0.000 #	R.DRY	0.000	R.DRY	0.000
18	R.DRY	0.000	R.DRY	0.000	34.750	1180 *	32.800	0.000 *	R.DRY	0.000	R.DRY	0.000
19	R.DRY	0.000	R.DRY	0.000	34.360	621.9 *	32.660	0.000 *	R.DRY	0.000	R.DRY	0.000
20	R.DRY	0.000	R.DRY	0.000	34.250	495.1 *	32.570	0.000 *	R.DRY	0.000	R.DRY	0.000
21	R.DRY	0.000	R.DRY	0.000	34.195	436.8 *	32.410	0.000 *	R.DRY	0.000	R.DRY	0.000
22	R.DRY	0.000	R.DRY	0.000	34.075	321.7 *	32.110	0.000 *	R.DRY	0.000	R.DRY	0.000
23	R.DRY	0.000	R.DRY	0.000	33.765	102.7 *	31.970	0.000 *	R.DRY	0.000	R.DRY	0.000
24	R.DRY	0.000	R.DRY	0.000	33.390	0.000 *	31.920	0.000 *	R.DRY	0.000	R.DRY	0.000
25	R.DRY	0.000	R.DRY	0.000	33.260	0.000 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
26	R.DRY	0.000	R.DRY	0.000	33.205	0.000 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
27	R.DRY	0.000	R.DRY	0.000	33.190	0.000 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
28	R.DRY	0.000	R.DRY	0.000	33.180	0.000 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
29	R.DRY	0.000	R.DRY	0.000	33.570	25.56 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
30	R.DRY	0.000	R.DRY	0.000	33.700	71.60 *	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
31			R.DRY	0.000	33.675	61.05 *			R.DRY	0.000		
Ten-Daily Mean												
I Ten-Daily	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	33.696	89.66	R.DRY	0.000	R.DRY	0.000
II Ten-Daily	R.DRY	0.000	R.DRY	0.000	34.870	1540	33.329	35.29	R.DRY	0.000	R.DRY	0.000
III Ten-Daily	R.DRY	0.000	R.DRY	0.000	33.564	92.67	32.103	0.000	R.DRY	0.000	R.DRY	0.000
Monthly												
Min.	R.DRY	0.000	R.DRY	0.000	33.180	0.000	31.920	0.000	R.DRY	0.000	R.DRY	0.000
Max.	R.DRY	0.000	R.DRY	0.000	35.850	3628	33.900	183.9	R.DRY	0.000	R.DRY	0.000
Mean	R.DRY	0.000	R.DRY	0.000	34.025	603.3	33.278	52.06	R.DRY	0.000	R.DRY	0.000

Annual Runoff in MCM = 994 Annual Runoff in mm = 31

Peak Observed Discharge = 160.7 cumecs on 08/09/2016 Corres. Water Level :33.855 m

Lowest Observed Discharge = 0.000 cumecs on 17/09/2016 Corres. Water Level :33.25 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 Data for the period 2016 - 2017

Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
2	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
3	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
4	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
5	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
6	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
7	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
8	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
9	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
10	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
11	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
12	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
13	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
14	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
15	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
16	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
17	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
18	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
19	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
20	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
21	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
22	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
23	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
24	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
25	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
26	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
27	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
28	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
29	R.DRY	0.000	R.DRY	0.000			R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
30	R.DRY	0.000	R.DRY	0.000			R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
31	R.DRY	0.000	R.DRY	0.000			R.DRY	0.000			R.DRY	0.000
Ten-Daily Mean												
I Ten-Daily	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
II Ten-Daily	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
III Ten-Daily	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
Monthly												
Min.	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
Max.	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000
Mean	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000

Annual Runoff in M(

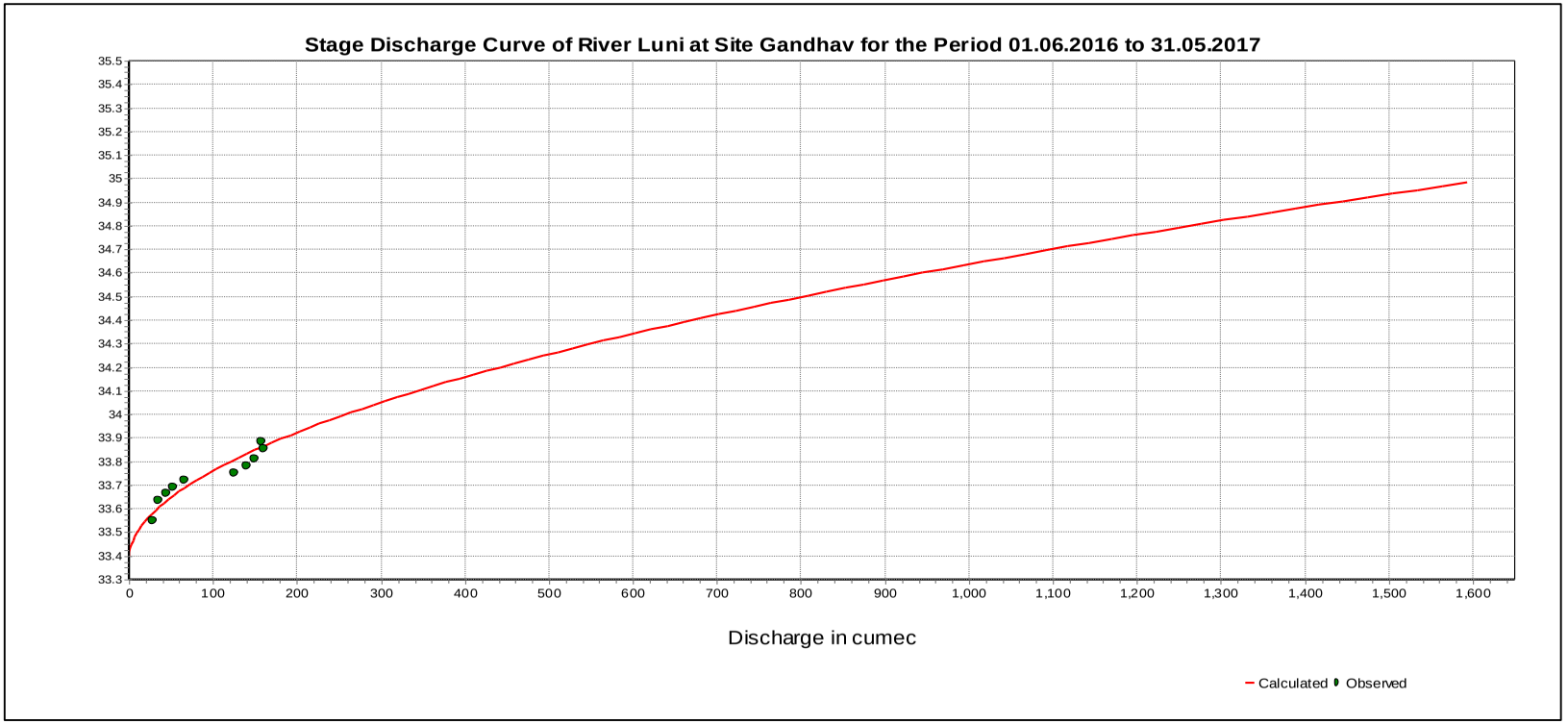
Peak Observed Discl **Peak Computed Discharge = 3628 cumecs on 16/08/2016** **Corres. Water Level :35.85 m**

Lowest Observed Di **Lowest Computed Discharge = 0.000 cumecs on 24/08/2016** **Corres. Water Level :33.39 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



Procedure - Standard

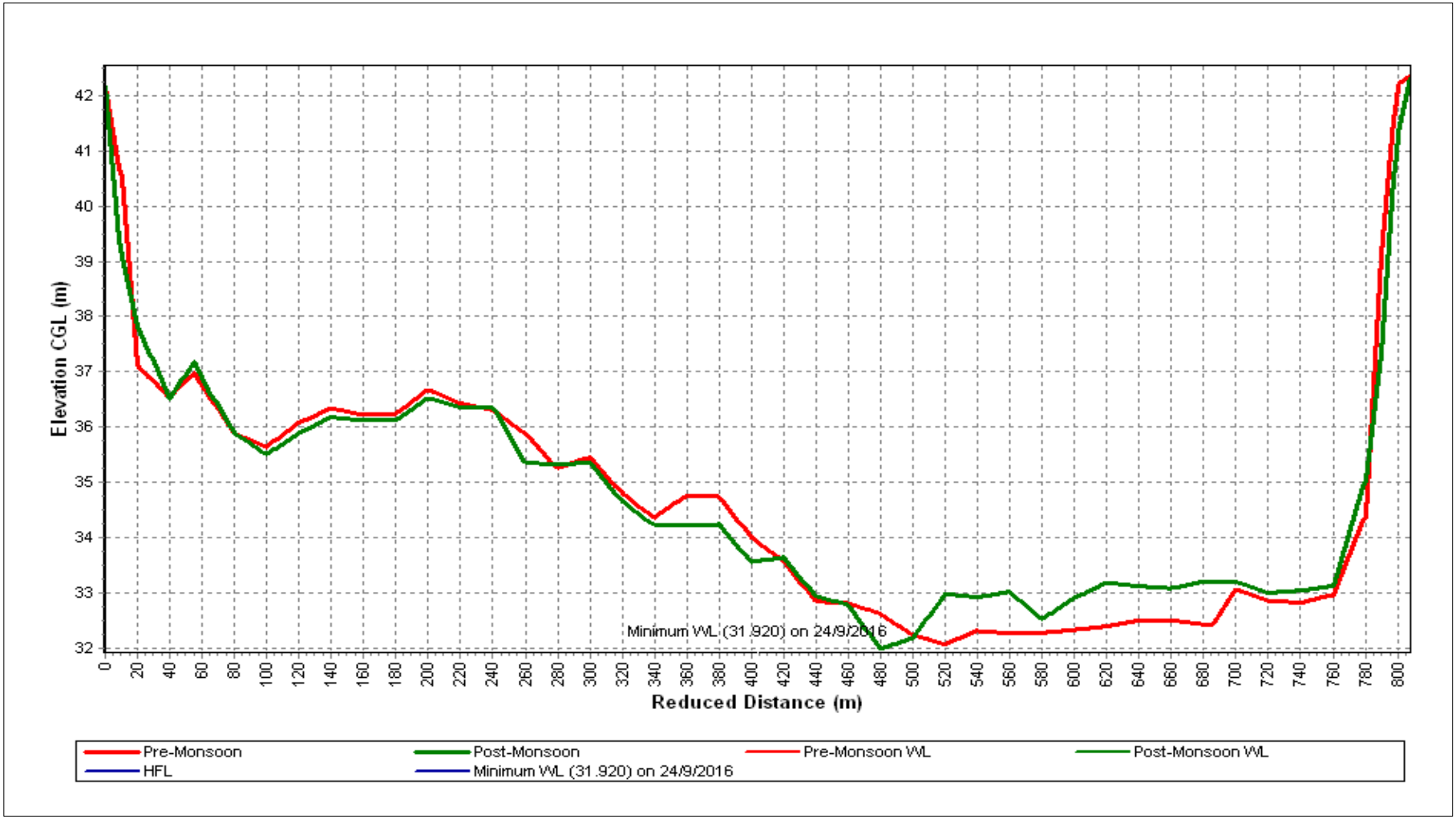
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
33.4	35	-33.39	1.895	658.85

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

Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

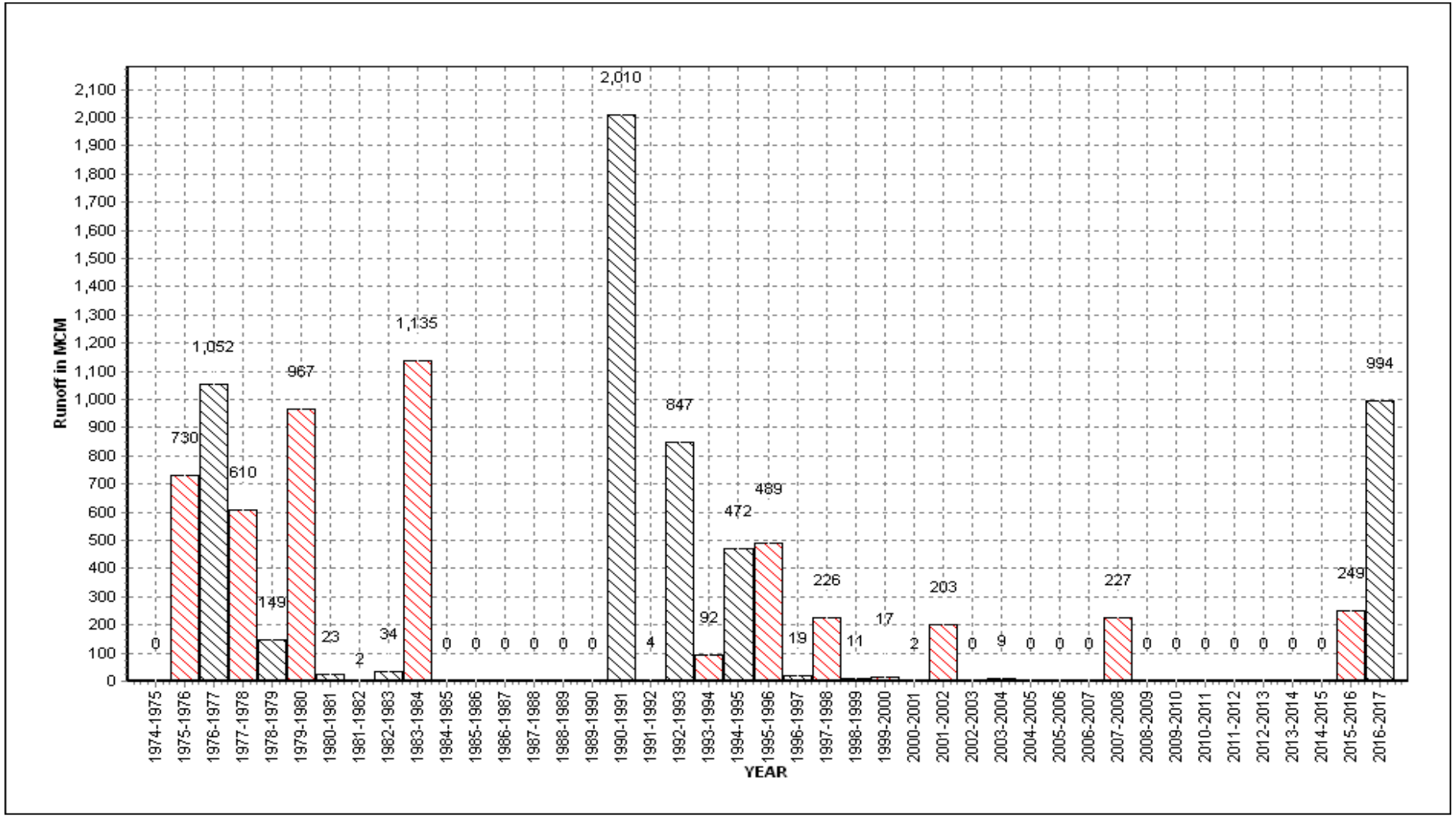


Historic Flood Level - 37.625 m on 07.07.1990 at 2100 hrs

Annual Runoff Values for the period: 1974 - 2017

Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

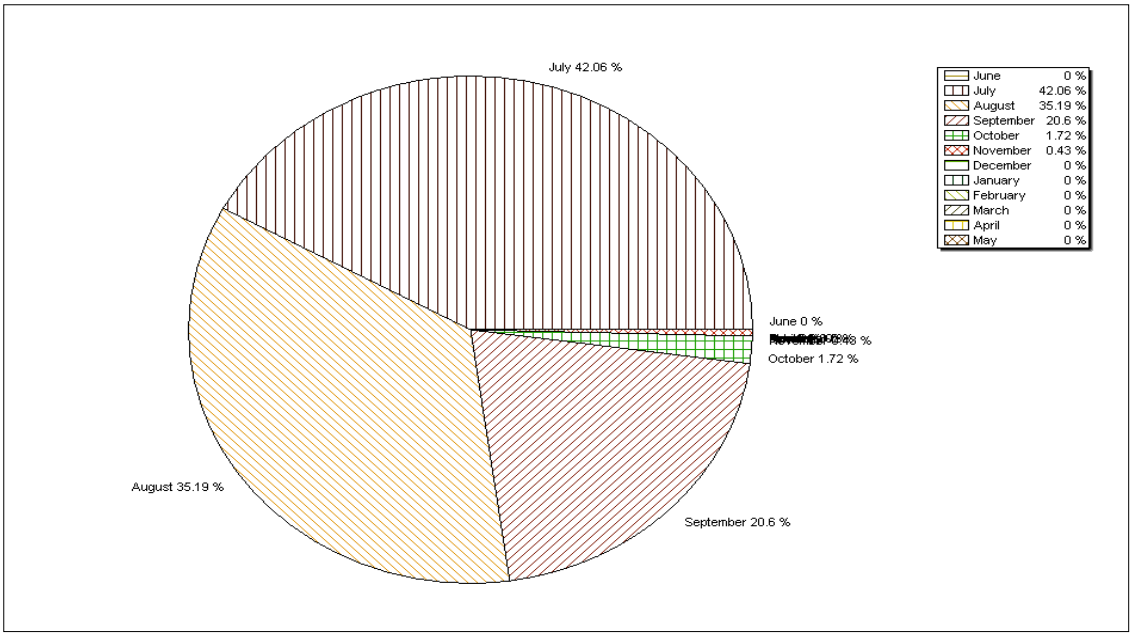


Note: Missing values have not been considered while arriving at Annual Runoff

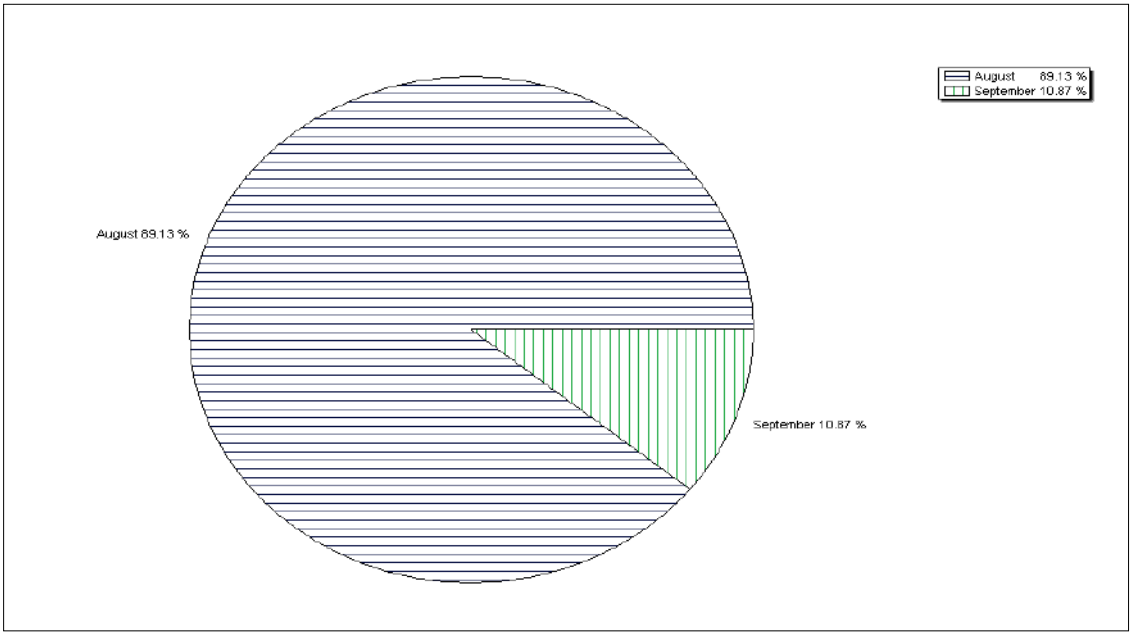
Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1974-2016



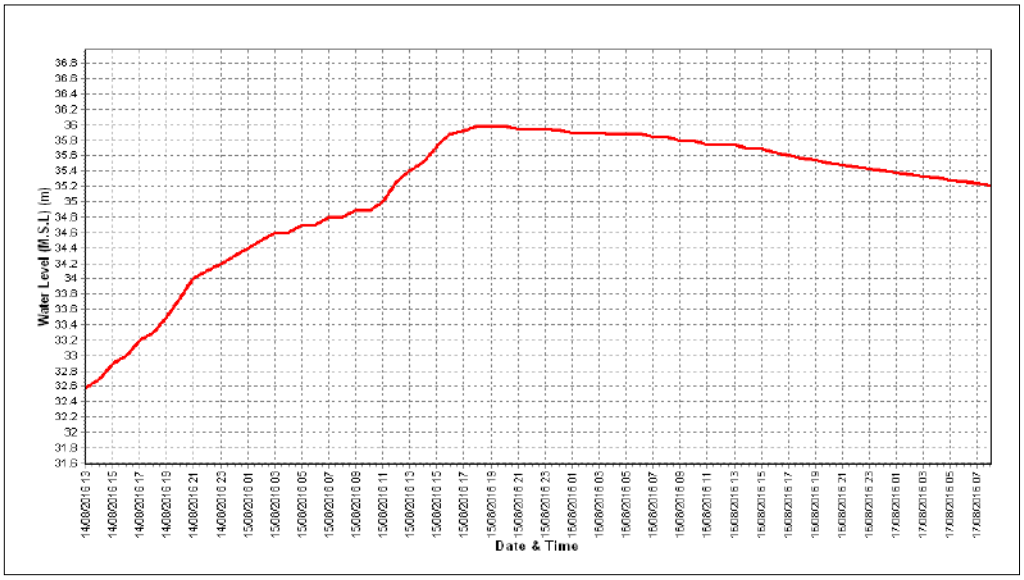
Monthly Runoff for the Year : 2016-2017



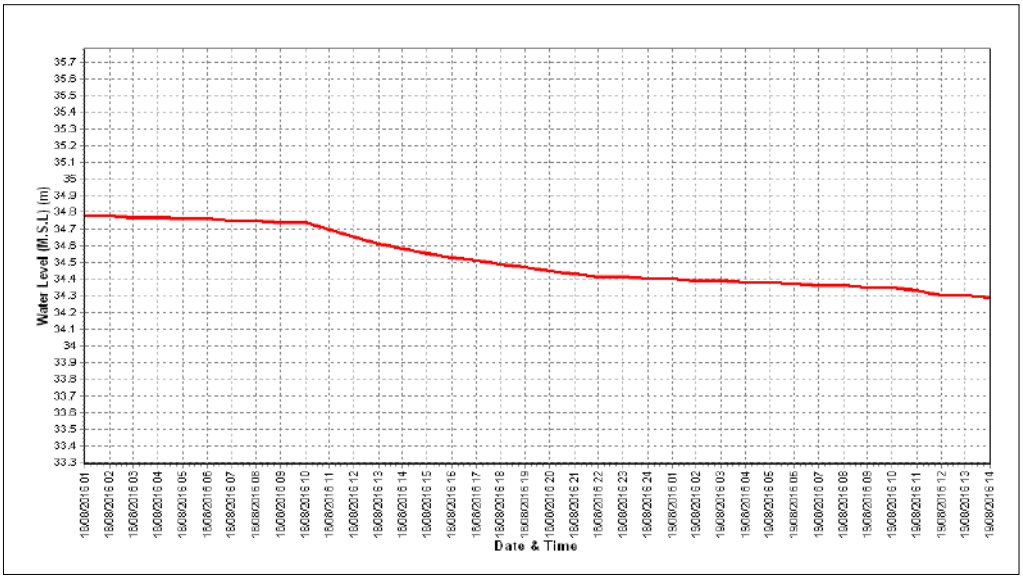
Station Name : Luni at Gandhav (01 02 01 002) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

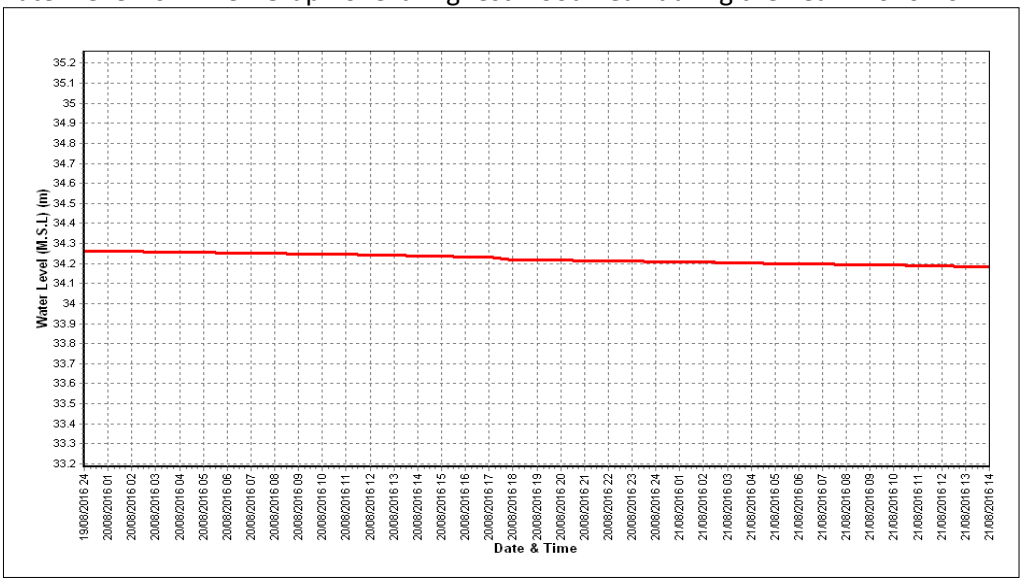
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-2017

Site : Luni at Balotra **Code : 01 02 01 001**

State : Rajasthan District : Badmer

Basin : WFR of Kach.-Saur. & Luni Independent River : Luni

Tributary : Sub Tributary :

Sub-Sub Tributary : Local River : Luni

Division : Mahi Division, Gandhinagar Sub-Division : B.L.Sub Divn, Palanpur

Drainage Area : 19000 Sq. Km. Bank : Left

Latitude : 25°49'19" N Longitude : 72°13'23" E

Zero of Gauge (m) : 102 (m.s.l) 05/07/1990 -

		Opening Date	Closing Date
Gauge	:	05/07/1990	
Discharge	:	05/07/1990	
Sediment	:	--	
Water Quality	:	--	

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1990-1991	1875	107.150	06/07/1990	0.000	Dry	25/01/1991
1991-1992	River Dry					
1992-1993	2907	106.040	09/09/1992	0.000	Dry	25/01/1993
1993-1994	30.36	102.890	20/07/1993	0.000	Dry	25/01/1994
1994-1995	364.3	103.797	16/08/1994	0.000	Dry	25/01/1995
1995-1996	2691	105.450	28/07/1995	0.000	Dry	26/01/1996
1996-1997	130.0	103.200	21/08/1996	0.000	Dry	25/01/1997
1997-1998	785.0	104.420	28/08/1997	0.000	Dry	25/01/1998
1998-1999	River Dry					
1999-2000	468.1	103.915	02/08/1999	0.000	Dry	27/01/2000
2000-2001	River Dry					
2001-2002	River Dry					
2002-2003	River Dry					
2003-2004	River Dry					

2004-2005	River Dry					
2005-2006	River Dry					
2006-2007	617.8	104.075	02/08/2006	0.000	Dry	01/06/2006
2007-2008	918.5	104.180	08/07/2007	0.000	Dry	01/06/2008
2008-2009	River Dry					
2009-2010	River Dry					
2010-2011	River Dry					
2011-2012	River Dry					
2012-2013	River Dry					
2013-2014	River Dry					
2014-2015	River Dry					
2015-2016	155.7	103.637	01/08/2015	0.000	102.13	07/08/2015
2016-2017	611.2	104.53	12/08/2016	0.000	Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Luni at Balotra (01 02 01 001) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.680	44.23	R.Dry	0.000	R.Dry	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.630	47.38	R.Dry	0.000	R.Dry	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.705	50.95	R.Dry	0.000	R.Dry	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	103.080	80.75	R.Dry	0.000	R.Dry	0.000
5	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.750	73.04	R.Dry	0.000	R.Dry	0.000
6	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.660	44.68	R.Dry	0.000	R.Dry	0.000
7	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.560	39.90	R.Dry	0.000	R.Dry	0.000
8	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.470	39.35	R.Dry	0.000	R.Dry	0.000
9	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.345	31.83	R.Dry	0.000	R.Dry	0.000
10	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	102.270	30.87	R.Dry	0.000	R.Dry	0.000
11	R.Dry	0.000	R.Dry	0.000	103.499	263.5	102.230	28.69	R.Dry	0.000	R.Dry	0.000
12	R.Dry	0.000	R.Dry	0.000	104.530	611.2	102.180	21.08	R.Dry	0.000	R.Dry	0.000
13	R.Dry	0.000	R.Dry	0.000	104.296	535.9	102.130	0.000	R.Dry	0.000	R.Dry	0.000
14	R.Dry	0.000	R.Dry	0.000	103.835	360.6	102.055	0.000	R.Dry	0.000	R.Dry	0.000
15	R.Dry	0.000	R.Dry	0.000	103.400	180.5	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	R.Dry	0.000	R.Dry	0.000	103.100	116.8 #	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	R.Dry	0.000	R.Dry	0.000	102.720	85.38	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	R.Dry	0.000	R.Dry	0.000	102.610	50.94 #	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	R.Dry	0.000	R.Dry	0.000	102.475	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	R.Dry	0.000	R.Dry	0.000	102.350	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	R.Dry	0.000	R.Dry	0.000	102.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	R.Dry	0.000	R.Dry	0.000	102.255	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	R.Dry	0.000	R.Dry	0.000	102.240	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	R.Dry	0.000	R.Dry	0.000	102.350	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	R.Dry	0.000	R.Dry	0.000	102.550	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	R.Dry	0.000	R.Dry	0.000	103.850	312.0 #	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	R.Dry	0.000	R.Dry	0.000	103.520	209.3 #	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	R.Dry	0.000	R.Dry	0.000	103.110	118.6 #	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	R.Dry	0.000	R.Dry	0.000	102.800	71.95 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	R.Dry	0.000	R.Dry	0.000	102.710	61.35 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31			R.Dry	0.000	102.670	46.29			R.Dry	0.000		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000			102.615	48.30	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	103.281	220.5	102.149	12.44	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	102.760	74.50			R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	102.240	0.000	102.055	0.000	R.Dry	0.000	R.Dry	0.000
Max.	R.Dry	0.000	R.Dry	0.000	104.530	611.2	103.080	80.75	R.Dry	0.000	R.Dry	0.000
Mean	R.Dry	0	R.Dry	0	103.008	144	102.482	38.05	R.Dry	0	R.Dry	0

Annual Runoff in MCM = 307 Annual Runoff in mm = 16

Peak Observed Discharge = 611.2 cumecs on 12/08/2016 Corres. Water Level :104.53 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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 Data for the period 2016 - 2017

Station Name : Luni at Balotra (01 02 01 001) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
5	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
6	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
7	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
8	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
9	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
10	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
11	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
12	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
13	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
14	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
15	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000			R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Max.	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Mean	R.Dry	0	R.Dry	0	R.Dry	0	R.Dry	0	R.Dry	0	R.Dry	0

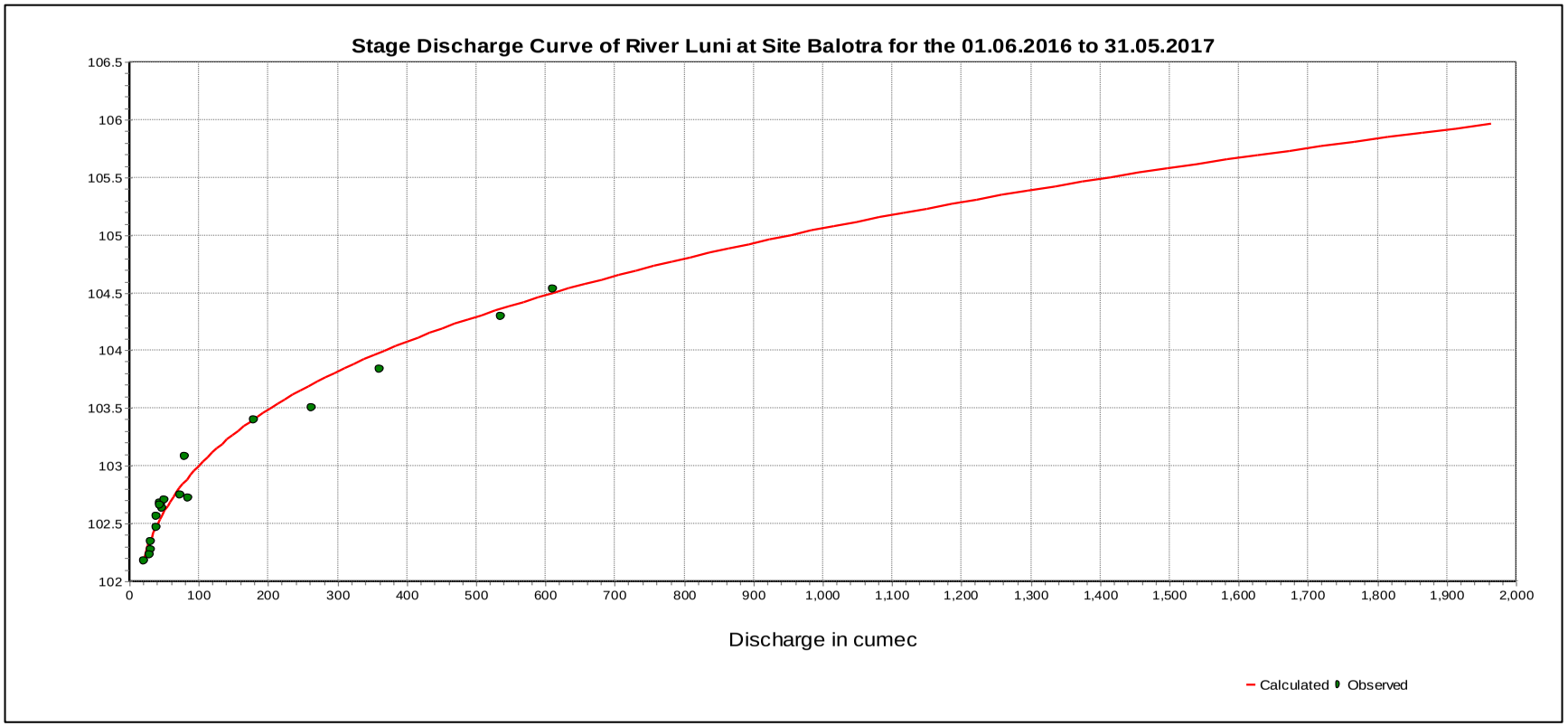
Peak Computed Discharge = 71.95 cumecs on 29/08/2016 **Corres. Water Level :102.8 m**

Lowest Computed Discharge = 0.000 cumecs on 14/06/2016

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



Procedure - Standard

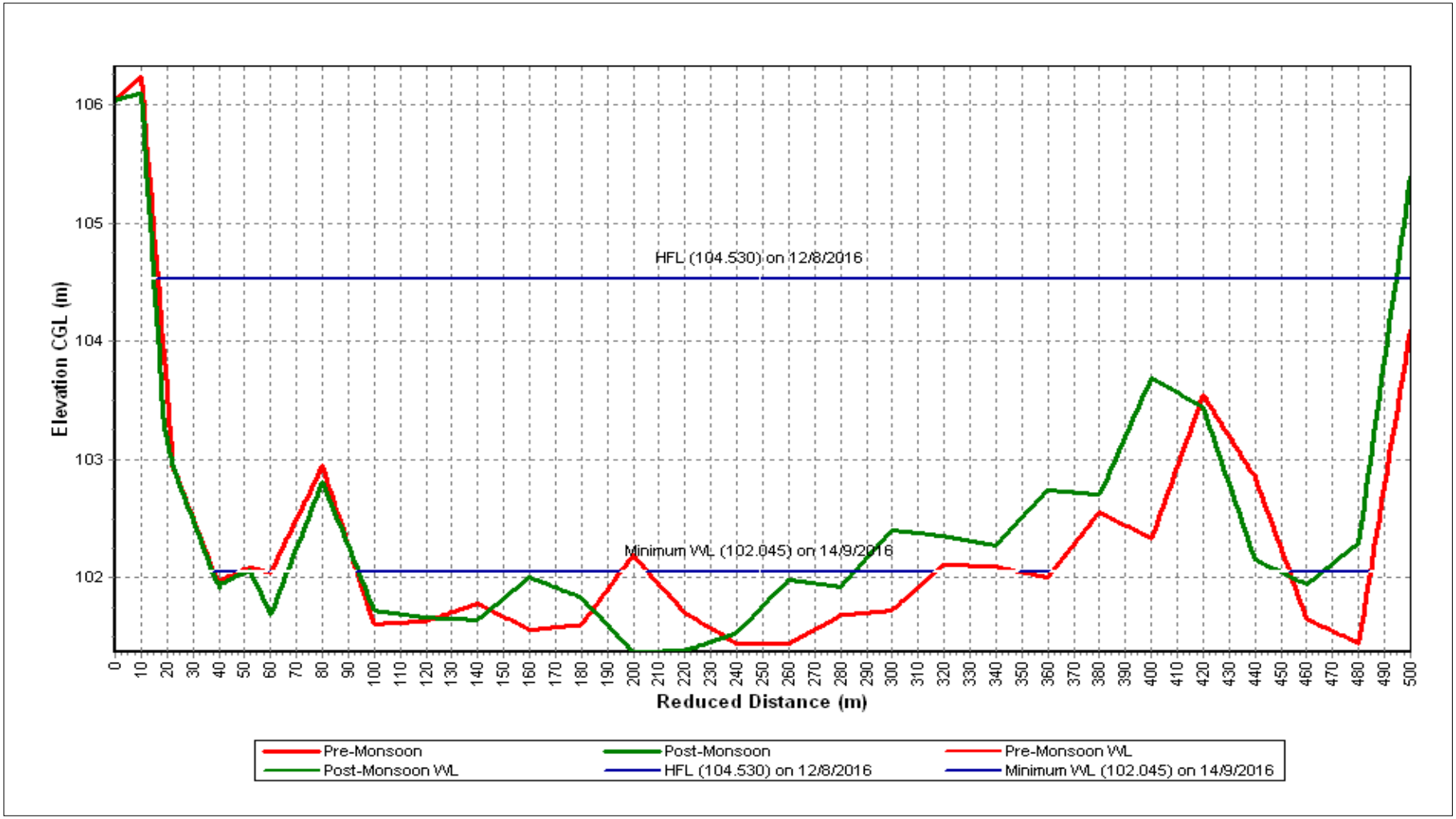
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
102.15	106	-100.76	3.533	5.796

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

Station Name : Luni at Balotra (01 02 01 001) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**



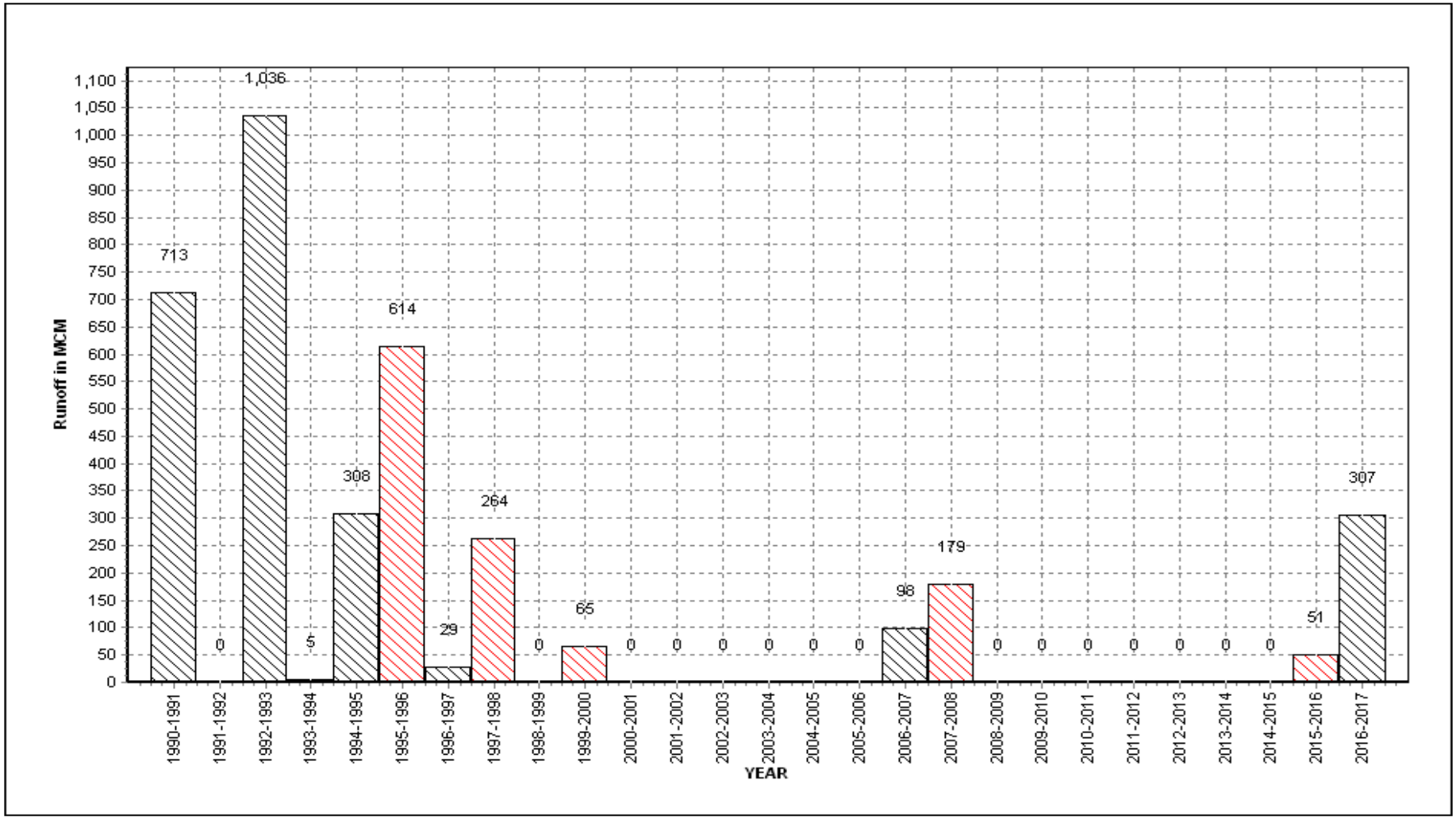
Historic Flood Level - 108.755 m on 18.07.1979

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1990 - 2017

Station Name : Luni at Balotra (01 02 01 001)
Local River : Luni

Division : Mahi Division, Gandhinagar
Sub-Division : B.L.Sub Divn, Palanpur

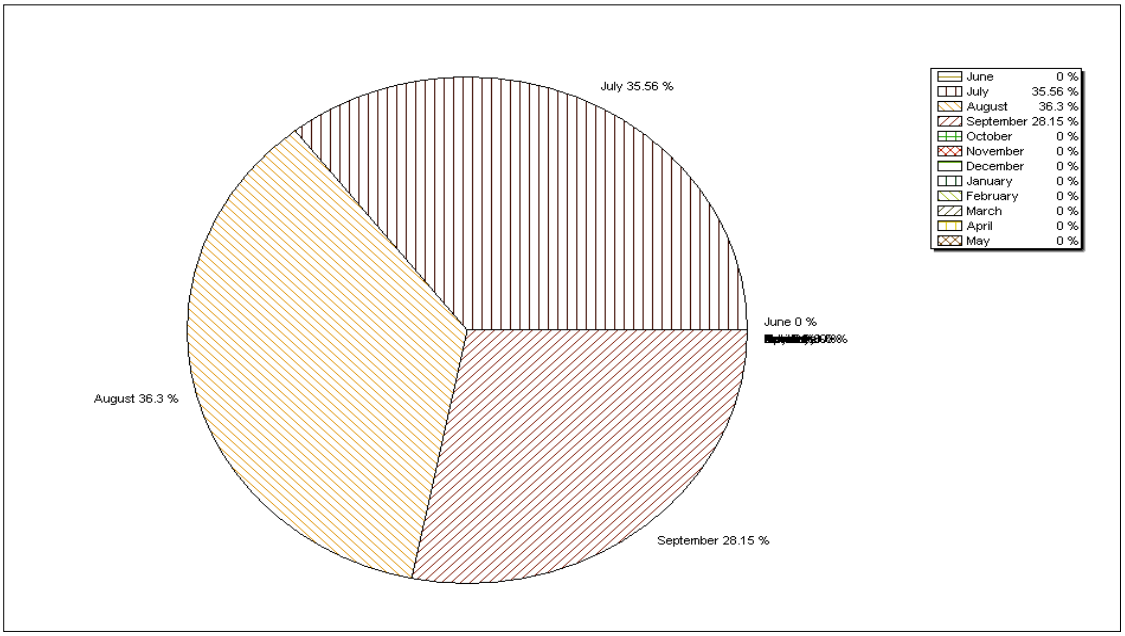


Note: Missing values have not been considered while arriving at Annual Runoff

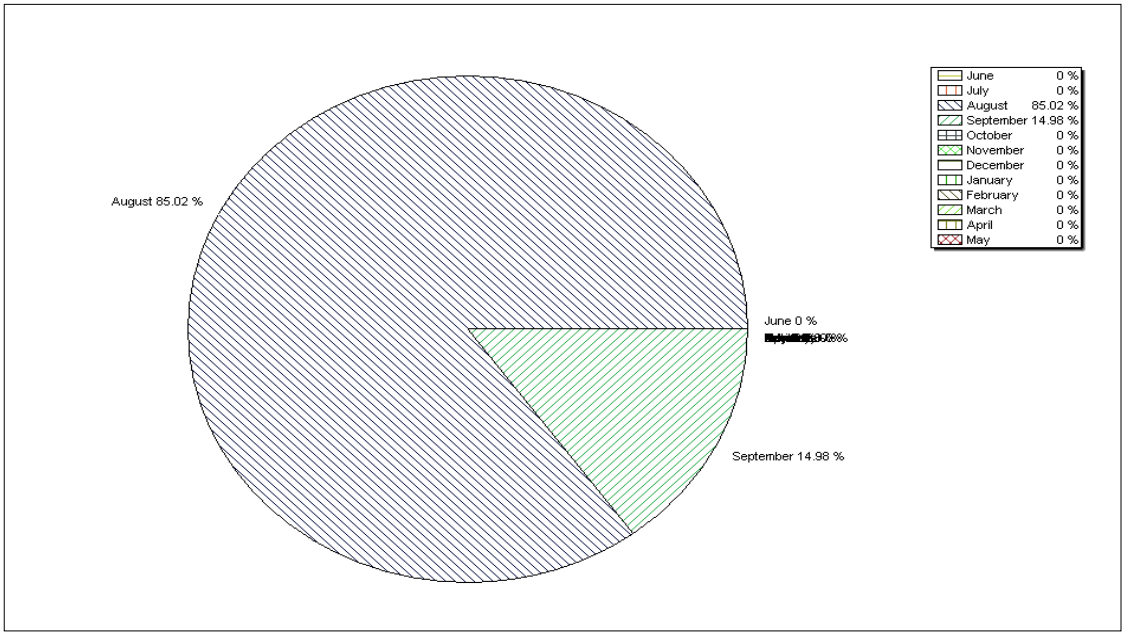
Station Name : Luni at Balotra (01 02 01 001) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1990-2016



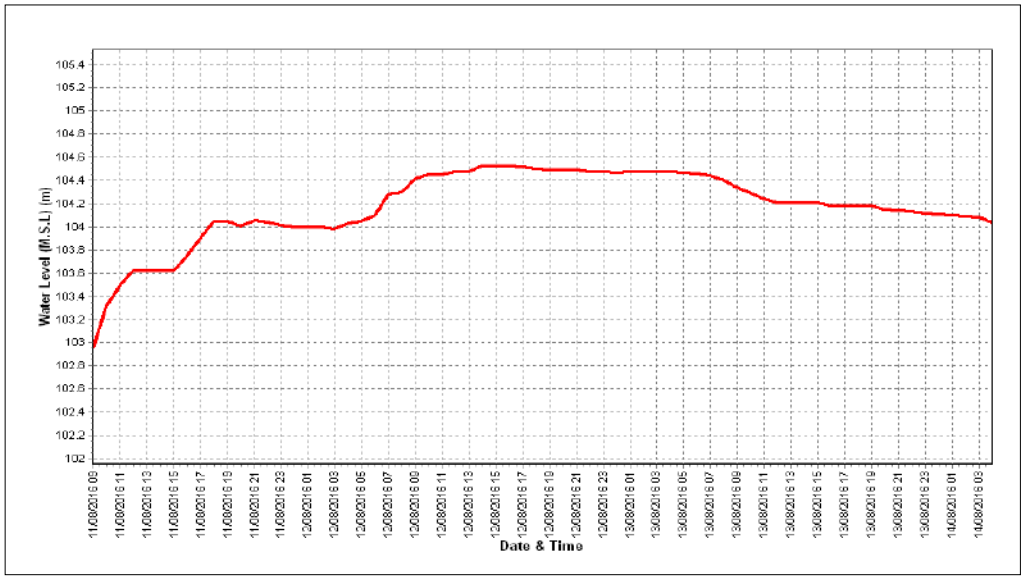
Monthly Runoff for the Year : 2016-2017



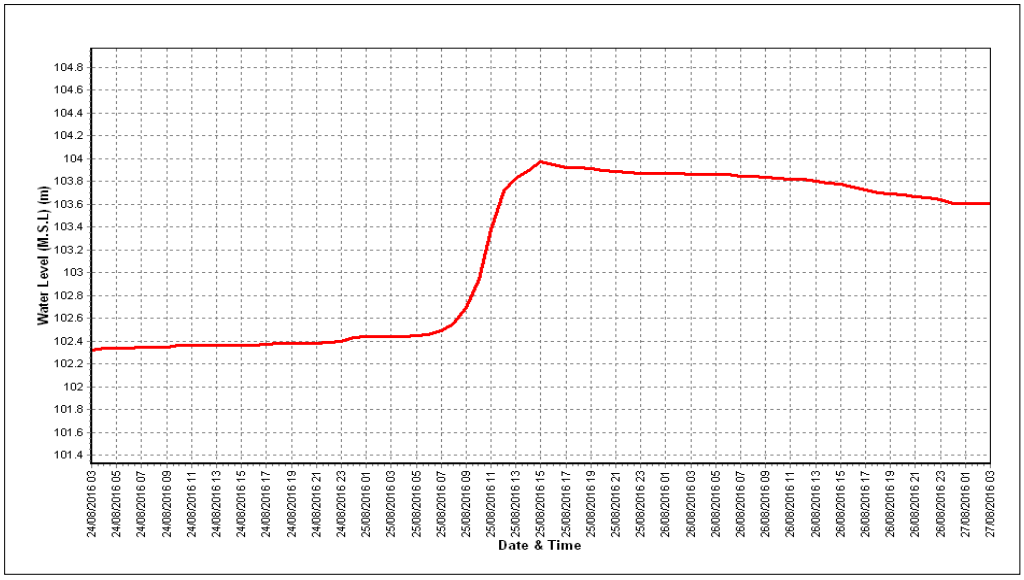
Station Name : Luni at Balotra (01 02 01 001) **Division : Mahi Division, Gandhinagar**

Local River : Luni **Sub-Division : B.L.Sub Divn, Palanpur**

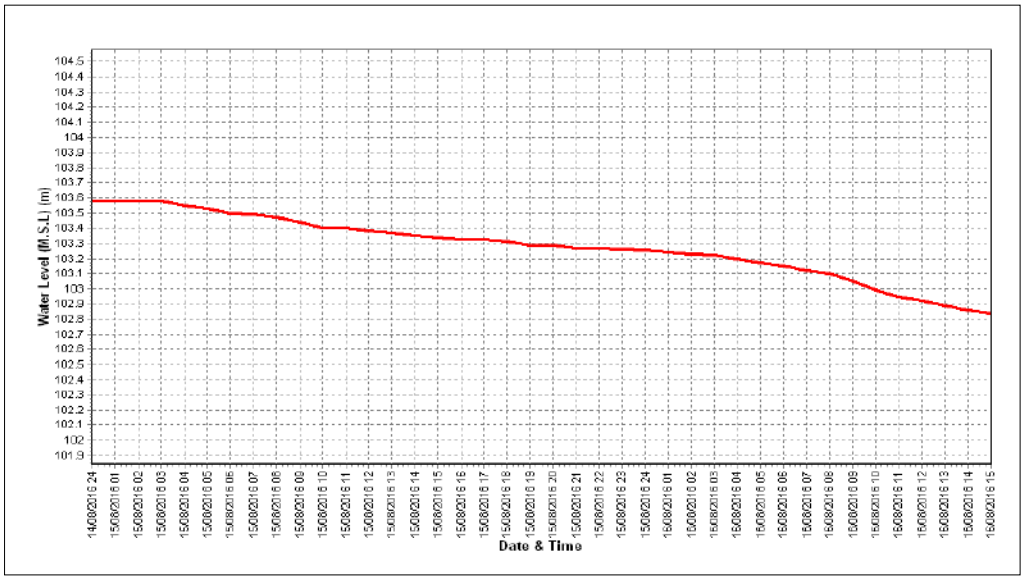
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Banas at Kamalpur**	**Code**	**:**	**01 02 02 007**
State	:	Gujarat	District		Banaskantha
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Banas
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Banas
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	B.L.Sub Divn, Palanpur
Drainage Area	:	6960 Sq. Km.	Bank	:	Right
Latitude	:	23°47'59" N	Longitude	:	71°45'00" E
Zero of Gauge (m)	:	34 (m.s.l)	01/06/1970	-	
		Opening Date	Closing Date		
Gauge	:	21/07/1971			
Discharge	:	25/07/1971			
Sediment	:	25/08/1973			
Water Quality	:	01/06/1977			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1971-1972	0.000	34.460	05/10/1971	0.000	River Dry	26/01/1972
1972-1973	River Dry					
1973-1974	371.0	36.515	05/09/1973	0.000	River Dry	28/06/1973
1974-1975	13.50	35.115	23/08/1974	0.000	River Dry	27/01/1975
1975-1976	380.7	36.175	13/08/1975	0.000	River Dry	16/06/1975
1976-1977	906.7	36.710	17/08/1976	0.000	River Dry	22/05/1977
1977-1978	3678	37.375	27/07/1977	0.100	34.775	09/06/1977
1978-1979	591.4	36.365	31/08/1978	0.600	35.085	27/05/1979
1979-1980	100.0	35.930	13/08/1979	0.000	River Dry	21/05/1980
1980-1981	262.7	36.032	24/06/1980	0.000	River Dry	12/05/1981
1981-1982	175.1	36.095	18/08/1981	0.000	River Dry	30/03/1982
1982-1983	1515	37.305	25/07/1982	0.000	River Dry	13/03/1983
1983-1984	342.7	36.375	03/08/1983	0.000	River Dry	06/03/1984
1984-1985	330.0	37.100	05/08/1984	0.000	River Dry	07/02/1985
1985-1986	38.51	35.395	07/08/1985	0.000	River Dry	25/01/1986
1986-1987	River Dry					
1987-1988	River Dry					
1988-1989	190.0	36.200	06/08/1988	0.000	River Dry	29/01/1989
1989-1990	70.00	35.235	26/08/1989	0.000	River Dry	25/01/1990
1990-1991	776.0	36.525	24/08/1990	0.000	River Dry	25/01/1991
1991-1992	6.233	35.303	24/07/1991	0.000	River Dry	26/01/1992
1992-1993	4221	38.010	08/09/1992	0.000	River Dry	26/01/1993
1993-1994	3120	36.771	18/07/1993	0.000	River Dry	17/12/1993
1994-1995	3691	37.270	09/09/1994	0.000	River Dry	13/07/1994
1995-1996	456.7	36.075	19/07/1995	0.000	River Dry	09/11/1995
1996-1997	River Dry					

1997-1998	789.4	37.165	26/06/1997	0.000	River Dry	12/01/1998
1998-1999	63.00	35.850	17/10/1998	0.000	River Dry	12/01/1999
1999-2000	River Dry					
2000-2001	20.04	35.570	16/07/2000	0.000	River Dry	25/01/2001
2001-2002	11.40	35.400	18/06/2001	0.000	River Dry	26/01/2002
2002-2003	River Dry					
2003-2004	395.3	36.245	29/07/2003	0.000	River Dry	26/01/2004
2004-2005	73.00	35.950	06/08/2004	0.000	River Dry	12/02/2005
2005-2006	43.74	35.700	02/08/2005	0.000	River Dry	01/06/2005
2006-2007	1480	37.545	20/08/2006	0.000	River Dry	01/06/2006
2007-2008	51.81	35.140	08/08/2007	0.000	River Dry	01/06/2007
2008-2009	117.6	35.465	02/08/2008	0.000	River Dry	01/06/2008
2009-2010	11.25	34.890	30/09/2009	0.000	River Dry	01/06/2009
2010-2011	320.2	36.080	25/07/2010	0.000	River Dry	01/06/2010
2011-2012	82.4	35.455	13/09/2011	0.000	River Dry	24/11/2011
2012-2013	38.6	35.220	14/09/2012	0.000	River Dry	01/06/2012
2013-2014	71.53	35.61	29/09/2013	0.000	River Dry	01/06/2013
2014-2015	172.8	36	10/09/2014	0.000	River Dry	01/06/2014
2015-2016	1071	37.075	29/07/2015	0.000	35.100	01/06/2015
2016-2017	74.42	35.77	24/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.290	15.83	R.Dry	0.000	R.Dry	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.320	18.04	R.Dry	0.000	R.Dry	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.320	20.51	R.Dry	0.000	R.Dry	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.320	19.08 *	R.Dry	0.000	R.Dry	0.000
5	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.090	6.116	R.Dry	0.000	R.Dry	0.000
6	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	35.055	6.247	R.Dry	0.000	R.Dry	0.000
7	R.Dry	0.000	R.Dry	0.000	35.400	25.16 *	34.980	3.023	R.Dry	0.000	R.Dry	0.000
8	R.Dry	0.000	R.Dry	0.000	35.420	22.89	34.750	0.610 *	R.Dry	0.000	R.Dry	0.000
9	R.Dry	0.000	R.Dry	0.000	35.440	23.37	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
10	R.Dry	0.000	R.Dry	0.000	35.450	30.62	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
11	R.Dry	0.000	R.Dry	0.000	35.540	39.01	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
12	R.Dry	0.000	R.Dry	0.000	35.630	46.35	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
13	R.Dry	0.000	R.Dry	0.000	35.630	42.64	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
14	R.Dry	0.000	R.Dry	0.000	35.500	34.43 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
15	R.Dry	0.000	R.Dry	0.000	35.480	35.18	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	R.Dry	0.000	R.Dry	0.000	35.150	14.47	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	R.Dry	0.000	R.Dry	0.000	35.100	11.66	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	R.Dry	0.000	R.Dry	0.000	34.910	1.709	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	R.Dry	0.000	R.Dry	0.000	34.980	3.837	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	R.Dry	0.000	R.Dry	0.000	35.000	5.810	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	R.Dry	0.000	R.Dry	0.000	35.100	7.580 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	R.Dry	0.000	R.Dry	0.000	35.320	21.89	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	R.Dry	0.000	R.Dry	0.000	35.445	27.54	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	R.Dry	0.000	R.Dry	0.000	35.770	74.42	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	R.Dry	0.000	R.Dry	0.000	35.520	36.52 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	R.Dry	0.000	R.Dry	0.000	35.490	28.87	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	R.Dry	0.000	R.Dry	0.000	35.290	15.81	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	R.Dry	0.000	R.Dry	0.000	35.240	14.08 *	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	R.Dry	0.000	R.Dry	0.000	35.250	15.55	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	R.Dry	0.000	R.Dry	0.000	35.250	16.08	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31			R.Dry	0.000	35.290	16.59			R.Dry	0.000		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000	35.427	25.51	35.141	11.18	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	35.292	23.51	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	35.360	24.99	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	34.910	1.709	34.750	0.610	R.Dry	0.000	R.Dry	0.000
Max.	R.Dry	0.000	R.Dry	0.000	35.770	74.42	35.320	20.51	R.Dry	0.000	R.Dry	0.000
Mean	R.Dry	0.000	R.Dry	0.000	35.344	24.48	35.141	11.18	R.Dry	0.000	R.Dry	0.000

Annual Runoff in MCM = 61 Annual Runoff in mm = 9

Peak Observed Discharge = 74.42 cumecs on 24/08/2016 Corres. Water Level :35.77 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

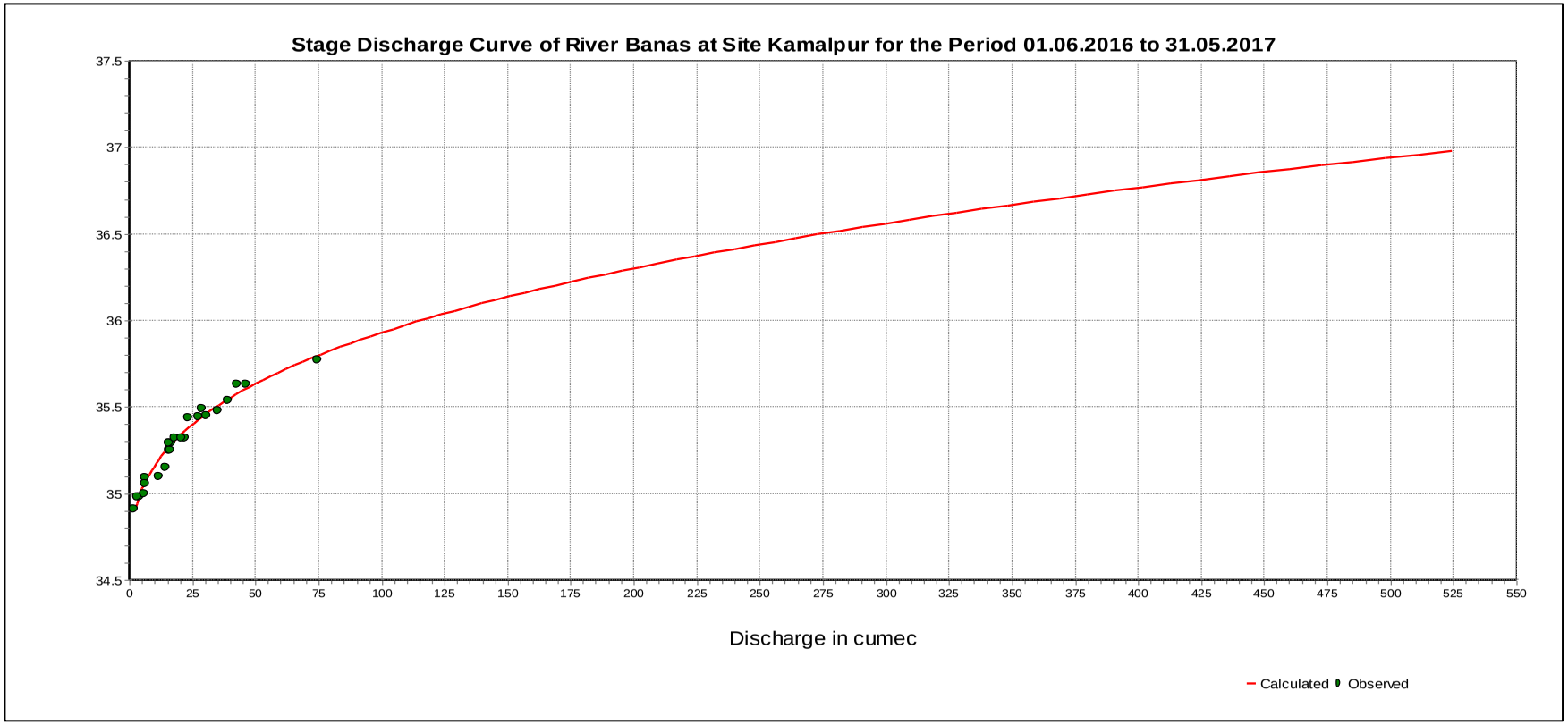
Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
5	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
6	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
7	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
8	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
9	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
10	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
11	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
12	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
13	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
14	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
15	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31	R.Dry	0.000	R.Dry	0.000			R.Dry	0.000			R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Max.	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Mean	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000

Peak Computed Discharge = 36.52 cumecs on 25/08/2016 **Corres. Water Level :35.52 m**

Lowest Computed Discharge = 0.000 cumecs on 01/10/2016

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

Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

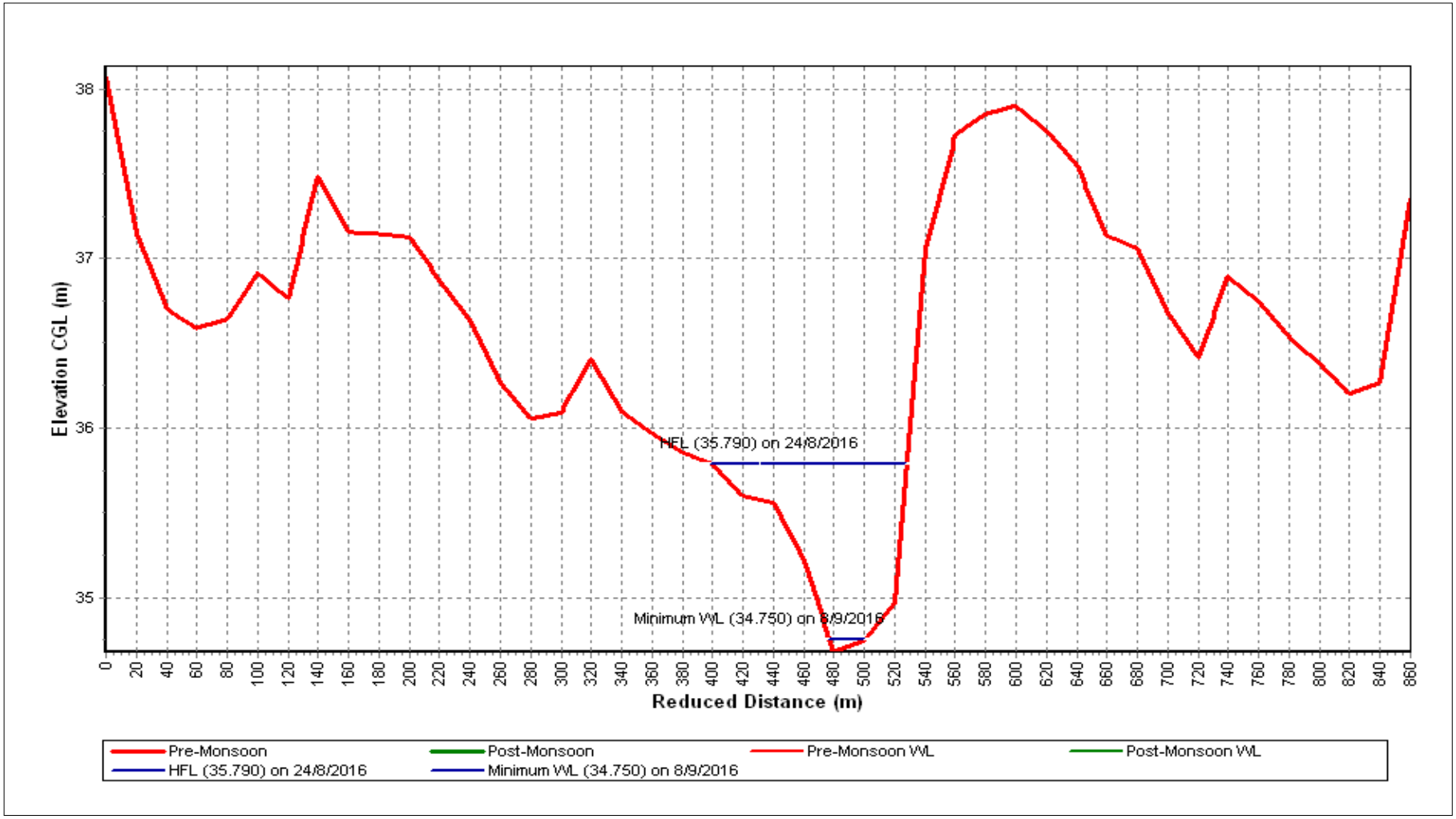
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
34.9	37	-34.48	3.039	32.419

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

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**



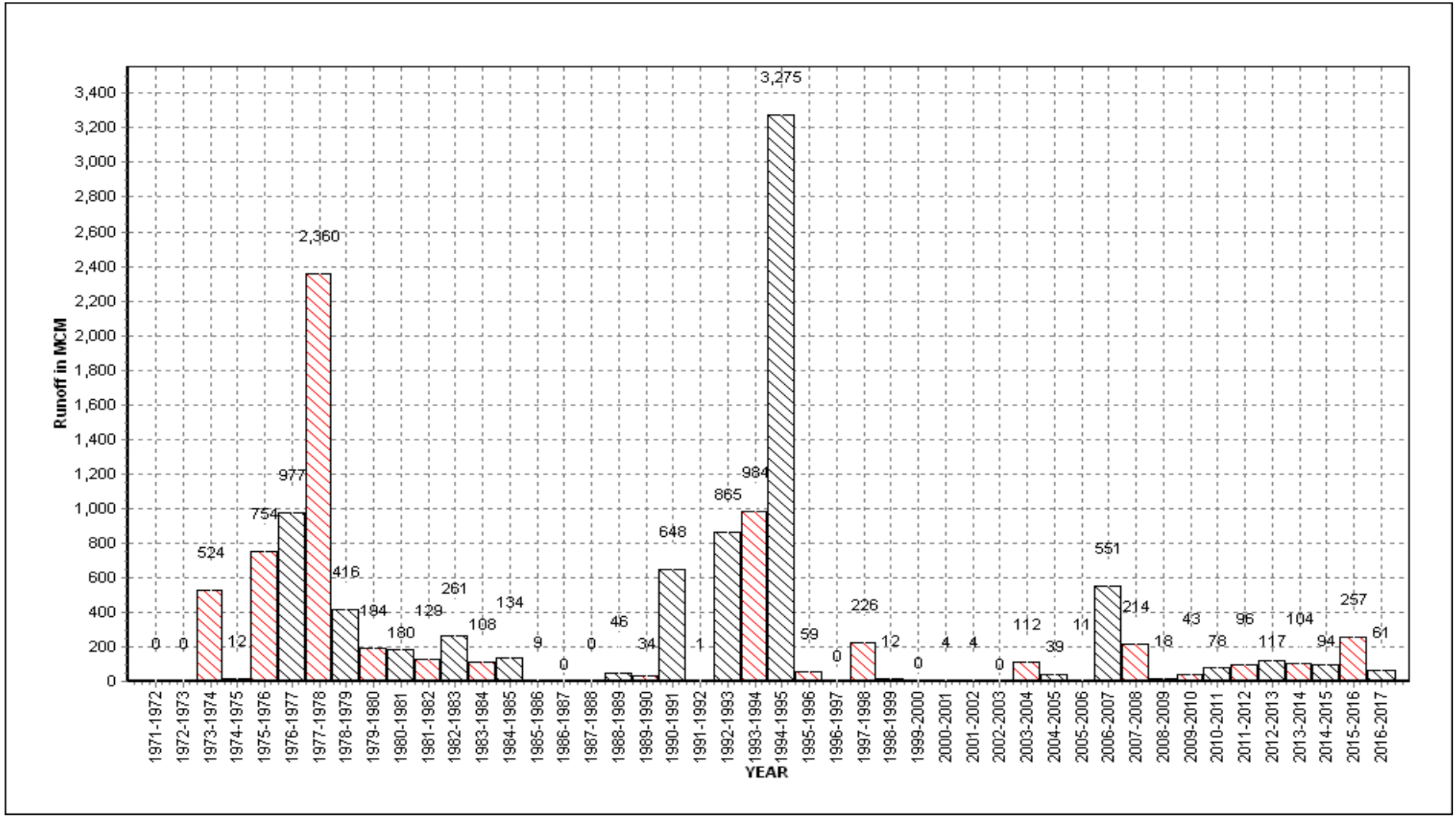
Histroical Flood Level-38.980m on 8.09.1992 at 1700 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1971 - 2017

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

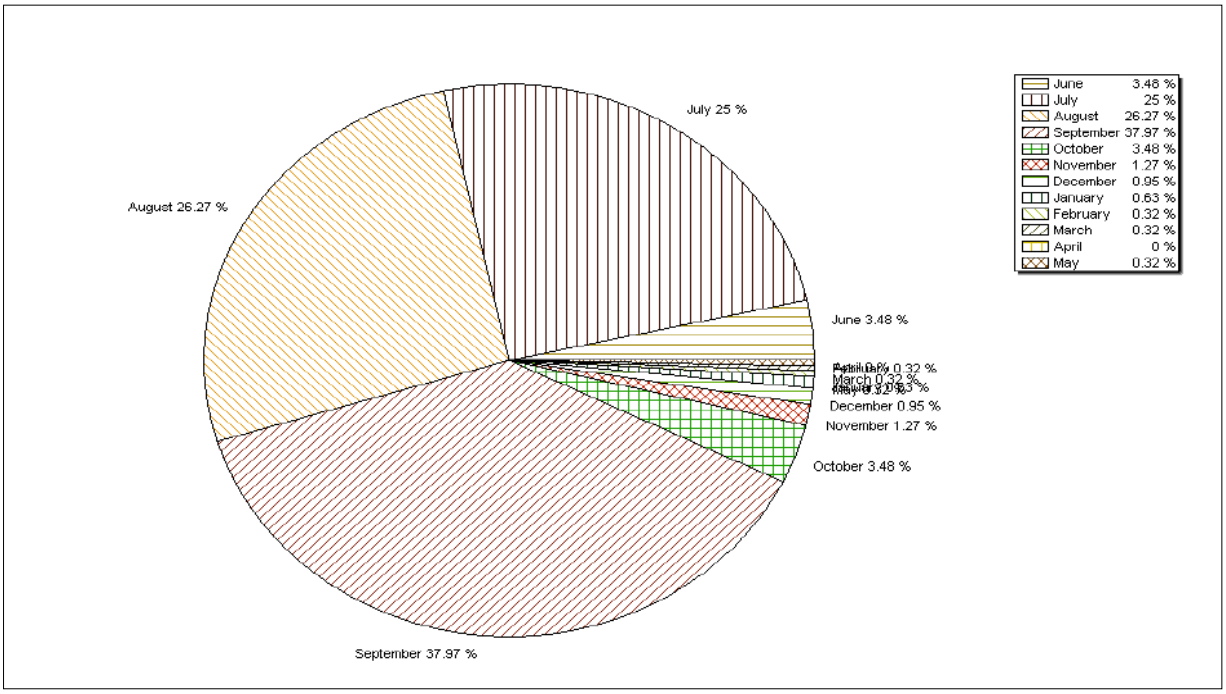


Note: Missing values have not been considered while arriving at Annual Runoff

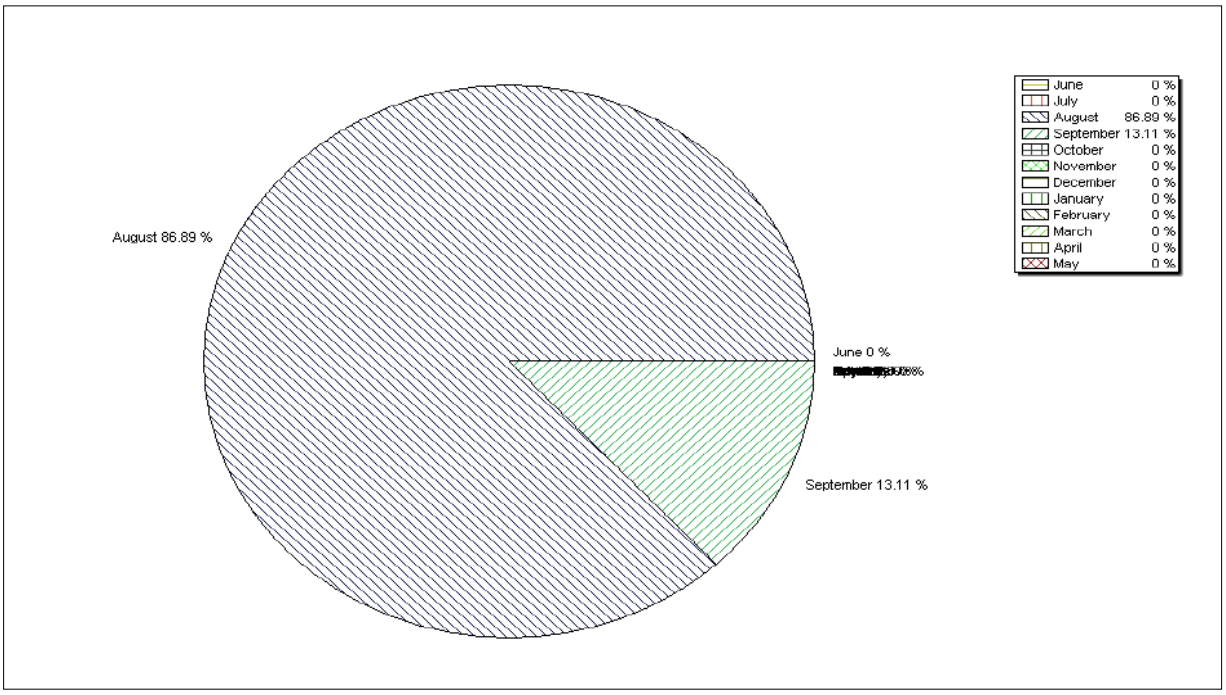
Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1971-2016



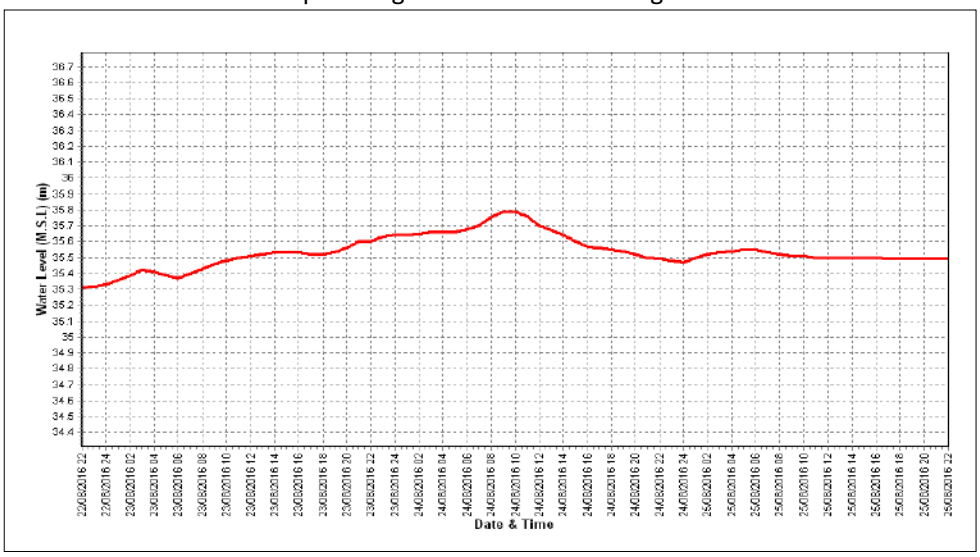
Monthly Average Runoff based on period : 2016-2017



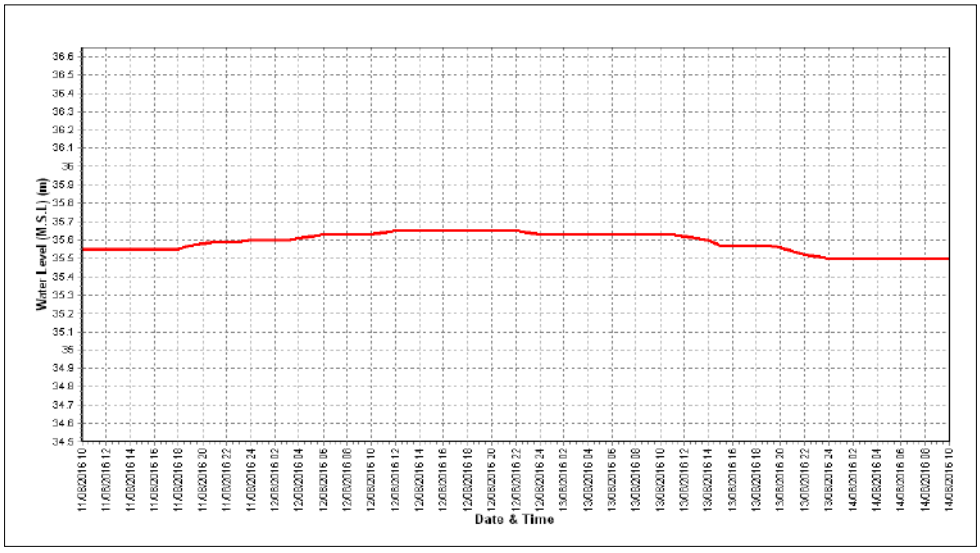
Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

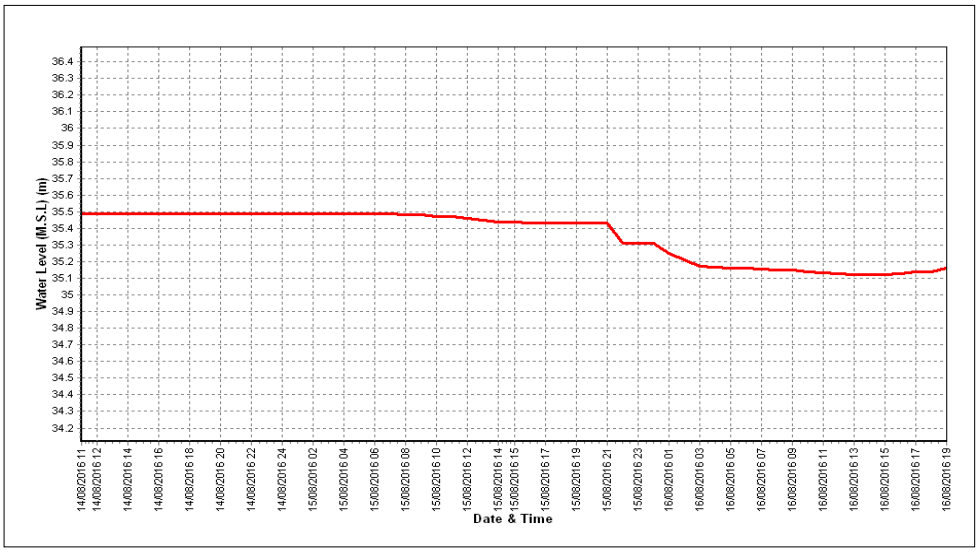
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Balaram at Chitrasani**	**Code**	:	**01 02 02 004**
State	:	Gujarat	District		Banaskantha
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Banas
Tributary	:	Balaram	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Balaram
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	B.L.Sub Divn, Palanpur
Drainage Area	:	345 Sq. Km.	Bank	:	Left
Latitude	:	24°17'20" N	Longitude	:	72°29'54" E
Zero of Gauge (m)	:	184 (m.s.l)	01/01/1985	-	
		Opening Date	Closing Date		
Gauge	:	08/05/1978			
Discharge	:	01/06/1990			
Sediment	:	--			
Water Quality	:	15/07/1988			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1990-1991	129.5	185.700	04/07/1990	0.000	River Dry	12/01/1991
1991-1992	17.13	185.150	31/07/1991	0.000	River Dry	13/02/1992
1992-1993	274.8	186.750	08/09/1992	0.000	River Dry	15/01/1993
1993-1994	99.91	185.264	10/07/1993	0.000	River Dry	30/12/1993
1994-1995	119.3	185.725	20/08/1994	0.000	184.070	16/05/1995
1995-1996	156.7	185.510	27/08/1995	0.000	184.430	26/01/1996
1996-1997	10.01	185.000	29/07/1996	0.000	184.050	25/01/1997
1997-1998	17.22	185.300	11/09/1997	0.000	184.180	25/01/1998
1998-1999	9.500	185.325	29/08/1998	0.000	184.350	05/12/1998
1999-2000	2.508	184.940	03/10/1999	0.000	River Dry	05/12/1999
2000-2001	1.100	184.500	16/07/2000	0.000	River Dry	08/11/2000
2001-2002	20.90	185.230	24/07/2001	0.000	184.350	10/11/2001
2002-2003	2.103	184.690	29/06/2002	0.000	River Dry	25/05/2003
2003-2004	10.50	185.000	10/07/2003	0.000	River Dry	04/02/2004
2004-2005	1.581	185.580	12/08/2004	0.000	River Dry	14/02/2005
2005-2006	8.668	185.720	16/09/2005	0.000	River Dry	01/06/2005
2006-2007	81.56	186.450	16/08/2006	0.000	River Dry	01/06/2006
2007-2008	40.71	186.285	05/08/2007	0.000	River Dry	01/06/2007
2008-2009	6.999	185.980	15/08/2008	0.000	River Dry	01/06/2008
2009-2010	30.4	186.335	23/07/2009	0.000	River Dry	01/06/2009
2010-2011	23.48	186.460	25/07/2010	0.000	River Dry	01/06/2010
2011-2012	268.557	187.120	12/09/2011	0.000	185.690	28/12/2011
2012-2013	7.5	186.100	11/07/2012	0.000	River Dry	01/06/2012
2013-2014	39.62	186.365	29/09/2013	0.000	River Dry	01/06/2013
2014-2015	9.33	186.1	12/09/2014	0.000	River Dry	01/06/2014
2015-2016	625.5	188.1	29/07/2015	0	185.55	18/10/2015
2016-2017	28.28	185.85	24/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	185.710	6.799	185.560	0.080 *	185.550	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	185.670	4.898	185.600	2.048	185.550	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	185.650	0.000	185.590	1.685	185.550	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	185.640	4.319	185.710	11.16 #	185.540	0.000
5	R.Dry	0.000	R.Dry	0.000	185.230	0.000	185.630	3.326	185.670	4.914	185.540	0.000
6	R.Dry	0.000	R.Dry	0.000	185.220	0.000	185.620	2.707	185.630	3.319	185.540	0.000
7	R.Dry	0.000	R.Dry	0.000	185.480	0.000	185.610	2.608	185.620	2.842	185.540	0.000
8	R.Dry	0.000	R.Dry	0.000	185.415	0.000	185.610	2.495	185.610	2.617	185.520	0.000
9	R.Dry	0.000	R.Dry	0.000	185.430	0.000	185.610	2.421	185.600	2.212	185.510	0.000
10	R.Dry	0.000	R.Dry	0.000	185.505	0.000	185.600	2.282	185.590	2.068	185.500	0.000
11	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.600	2.120	185.590	1.748	185.490	0.000
12	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.600	1.972	185.590	1.606	185.480	0.000
13	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.590	1.874	185.590	1.423	185.470	0.000
14	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.590	1.599	185.580	1.140	185.460	0.000
15	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.580	0.867	185.580	1.092	185.460	0.000
16	R.Dry	0.000	R.Dry	0.000	185.540	0.000	185.580	0.836	185.580	0.930	185.450	0.000
17	R.Dry	0.000	R.Dry	0.000	185.520	0.000	185.580	0.812	185.580	0.890	185.450	0.000
18	R.Dry	0.000	R.Dry	0.000	185.490	0.000	185.580	0.777	185.570	0.511	185.450	0.000
19	R.Dry	0.000	R.Dry	0.000	185.450	0.000	185.580	0.751	185.570	0.448	185.450	0.000
20	R.Dry	0.000	R.Dry	0.000	185.450	0.000	185.580	0.725	185.570	0.396	185.440	0.000
21	R.Dry	0.000	R.Dry	0.000	185.450	0.000	185.580	0.697	185.560	0.210	185.440	0.000
22	R.Dry	0.000	R.Dry	0.000	185.450	0.000	185.570	0.680	185.560	0.080 *	185.440	0.000
23	R.Dry	0.000	R.Dry	0.000	185.480	0.000	185.570	0.331	185.560	0.080 *	185.440	0.000
24	R.Dry	0.000	R.Dry	0.000	185.850	28.28	185.570	0.320	185.560	0.080 *	185.440	0.000
25	R.Dry	0.000	R.Dry	0.000	185.680	5.375	185.560	0.080 *	185.560	0.080 *	185.440	0.000
26	R.Dry	0.000	R.Dry	0.000	185.630	4.477	185.560	0.080 *	185.560	0.080 *	185.440	0.000
27	R.Dry	0.000	R.Dry	0.000	185.620	3.468	185.560	0.080 *	185.560	0.080 *	185.440	0.000
28	R.Dry	0.000	R.Dry	0.000	185.700	6.297	185.560	0.080 *	185.550	0.000 *	185.440	0.000
29	R.Dry	0.000	R.Dry	0.000	185.650	4.814	185.560	0.080 *	185.550	0.000 *	185.440	0.000
30	R.Dry	0.000	R.Dry	0.000	185.640	4.991	185.560	0.080 *	185.550	0.000 *	185.440	0.000
31			R.Dry	0.000	185.640	4.602			185.550	0.000 *		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000	185.380	0.000	185.635	3.186	185.618	3.294	185.534	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	185.515	0.000	185.586	1.233	185.580	1.018	185.460	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	185.617	5.664	185.565	0.251	185.556	0.063	185.440	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	185.220	0.000	185.560	0.000	185.550	0.000	185.440	0.000
Max.	R.Dry	0.000	R.Dry	0.000	185.850	28.28	185.710	6.799	185.710	11.16	185.550	0.000
Mean	R.Dry	0.000	R.Dry	0.000	185.527	2.308	185.595	1.557	185.584	1.413	185.478	0.000

Annual Runoff in MCM = 13 Annual Runoff in mm = 38

Peak Observed Discharge = 28.28 cumecs on 24/08/2016 Corres. Water Level :185.85 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

Note: Estimation of discharge for dicarded data and non-obseravtion period using S-D curve of V

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 Data for the period 2016 - 2017

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
2	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
3	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
4	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
5	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
6	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
7	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
8	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
9	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
10	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
11	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
12	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
13	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
14	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
15	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	185.440	0.000	185.430	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	185.440	0.000	185.430	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	185.440	0.000	185.430	0.000			R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31	185.440	0.000	185.410	0.000			R.Dry	0.000			R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	185.440	0.000	185.435	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	185.440	0.000	185.410	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Max.	185.440	0.000	185.440	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Mean	185.440	0.000	185.438	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000

Peak Computed Discharge = 0.080 cumecs on 25/09/2016 **Corres. Water Level :185.56 m**

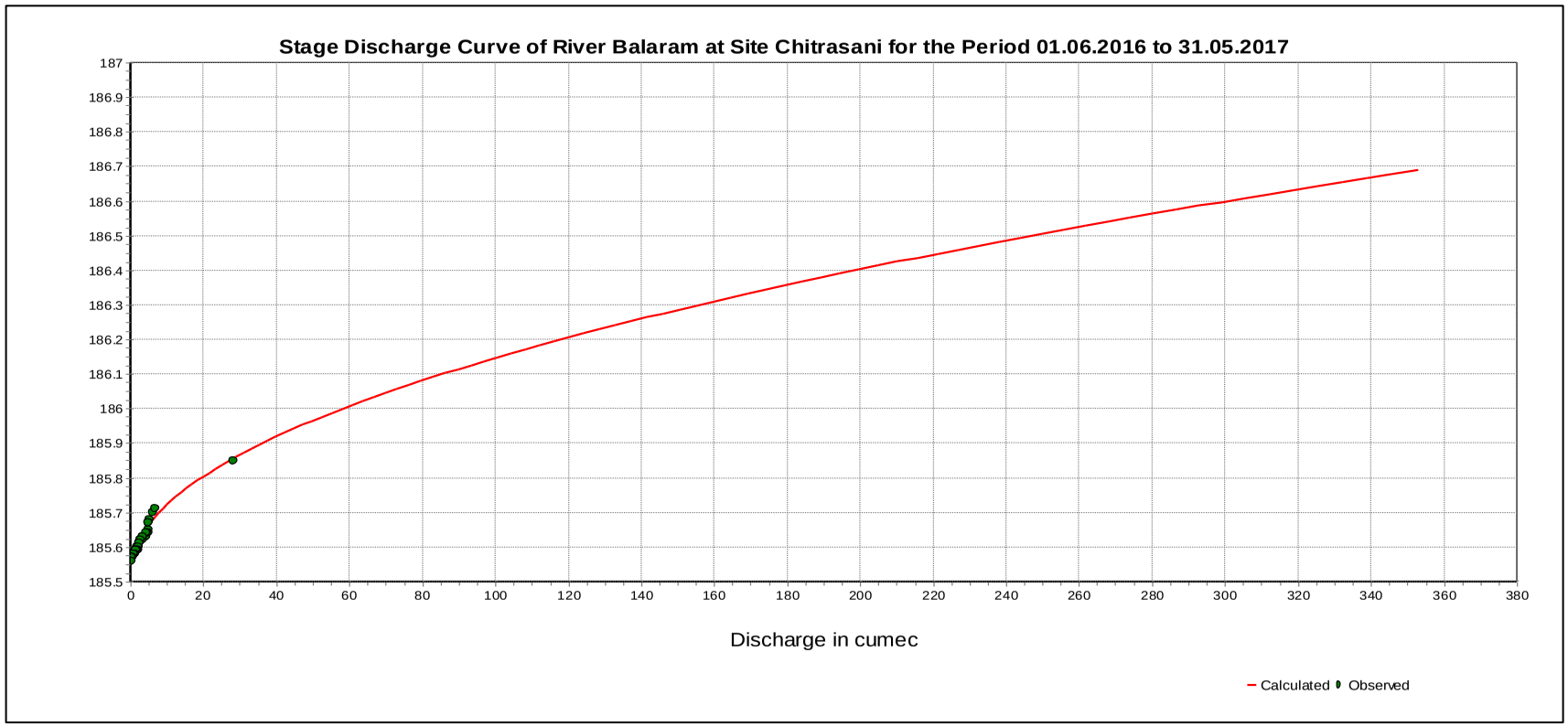
Lowest Computed Discharge = 0.000 cumecs on 28/10/2016 **Corres. Water Level :185.55 m**

WYB 2015-16

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



Note: Estimation of discharge for dicarded data and non-obseravtion period using S-D curve of WYB 2015-16

Procedure - Standard

Equation Type - Parabolic Q=a+b*h+c*(h^2)

LB	UB	a	b	c
185.55	186.7	9033783	-97383.6	262.447

S-D Curve WYB 2015-16

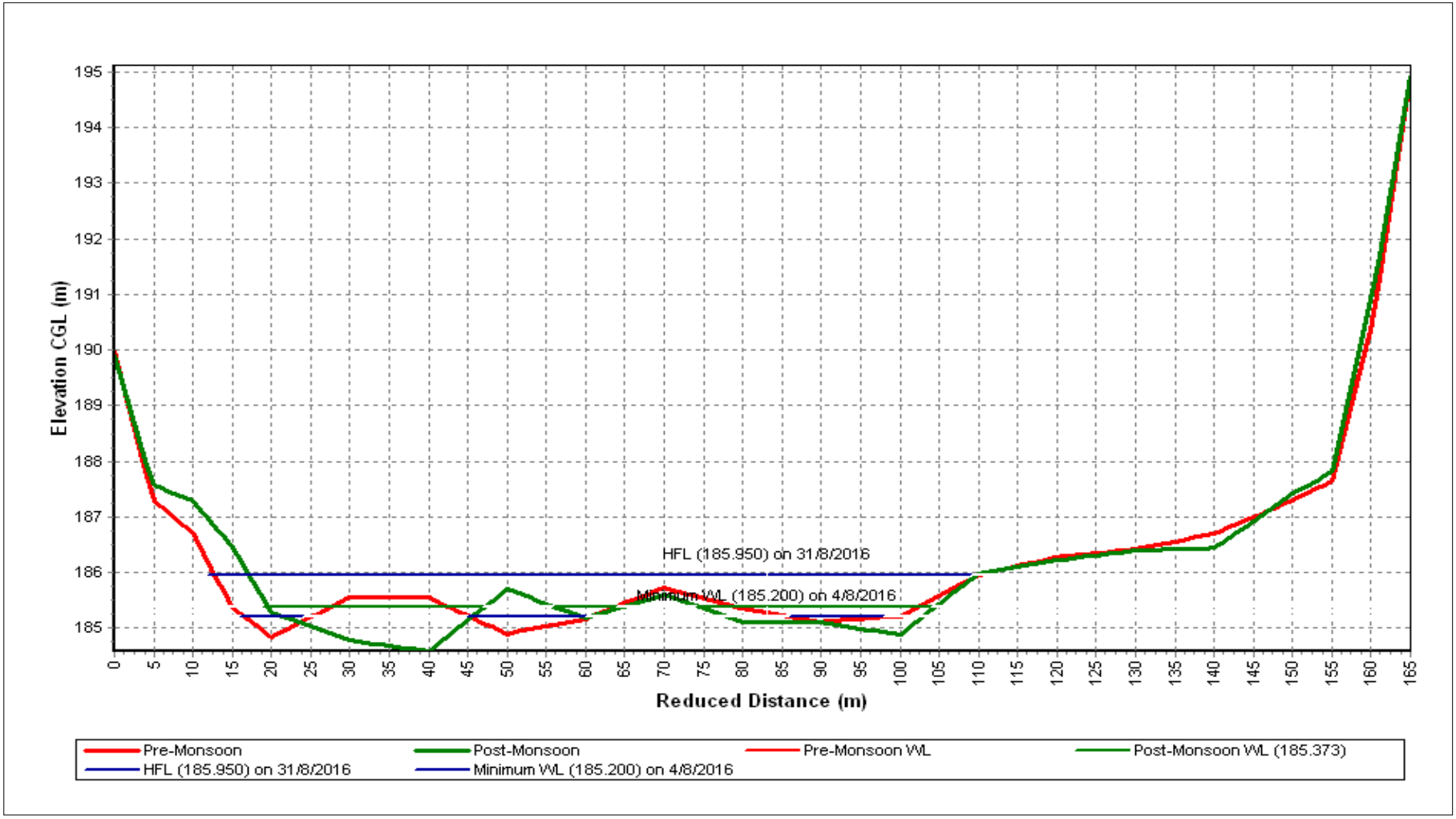
Equation Type - Power Q=c*(h+a)b

LB	UB	a	b	c
185.56	188.5	-185.555	1.434	161.99

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

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**



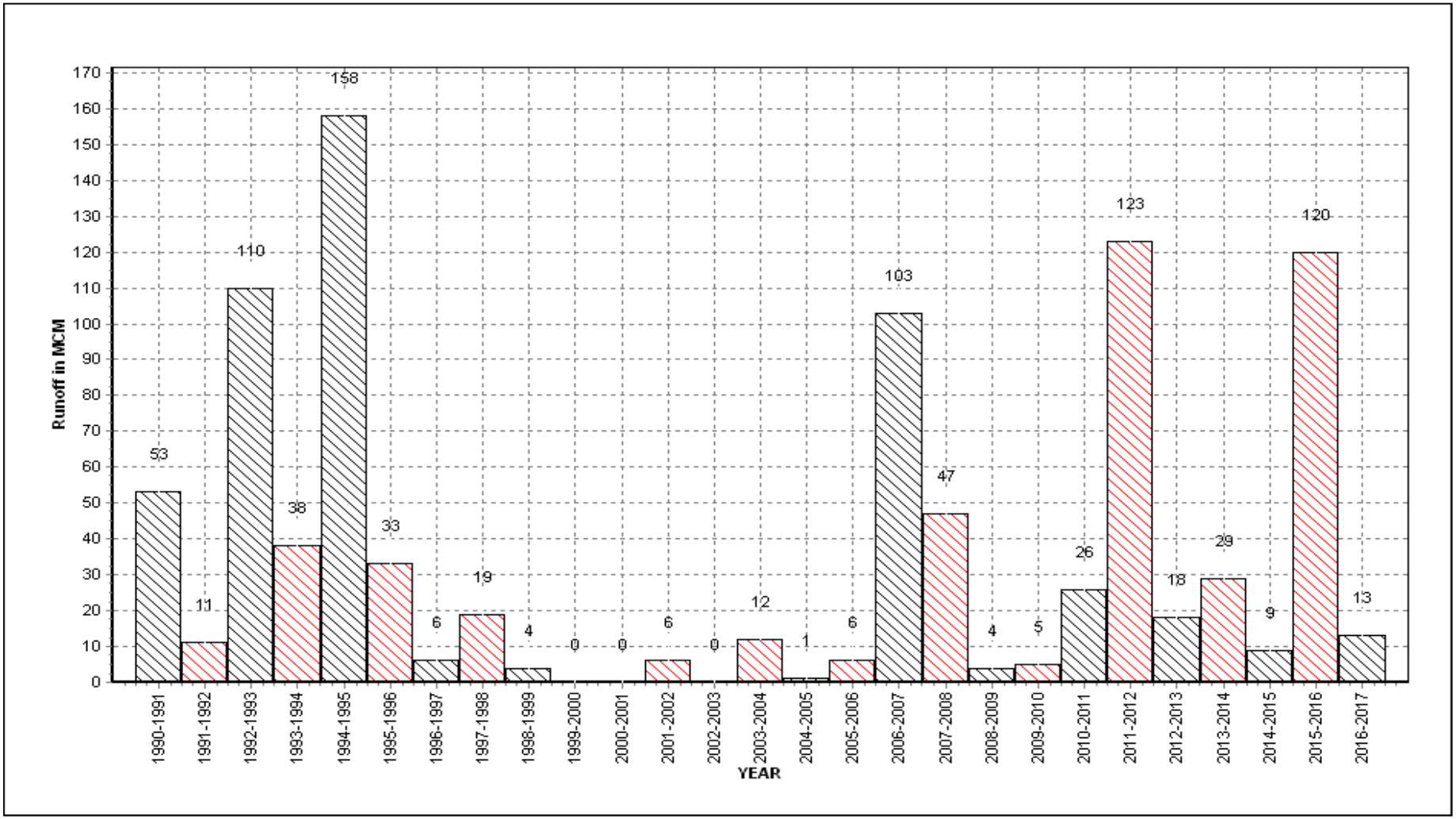
Historic Flood Level-190.77 m on 29.07.2015 at 0900 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1990 - 2017

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

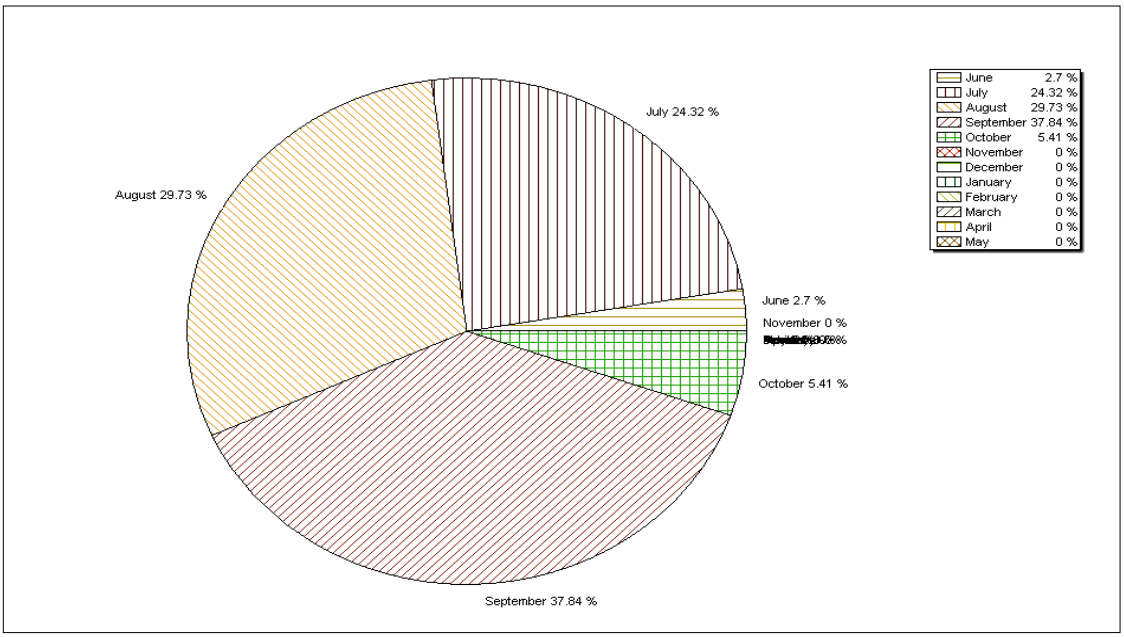


Note: Missing values have not been considered while arriving at Annual Runoff

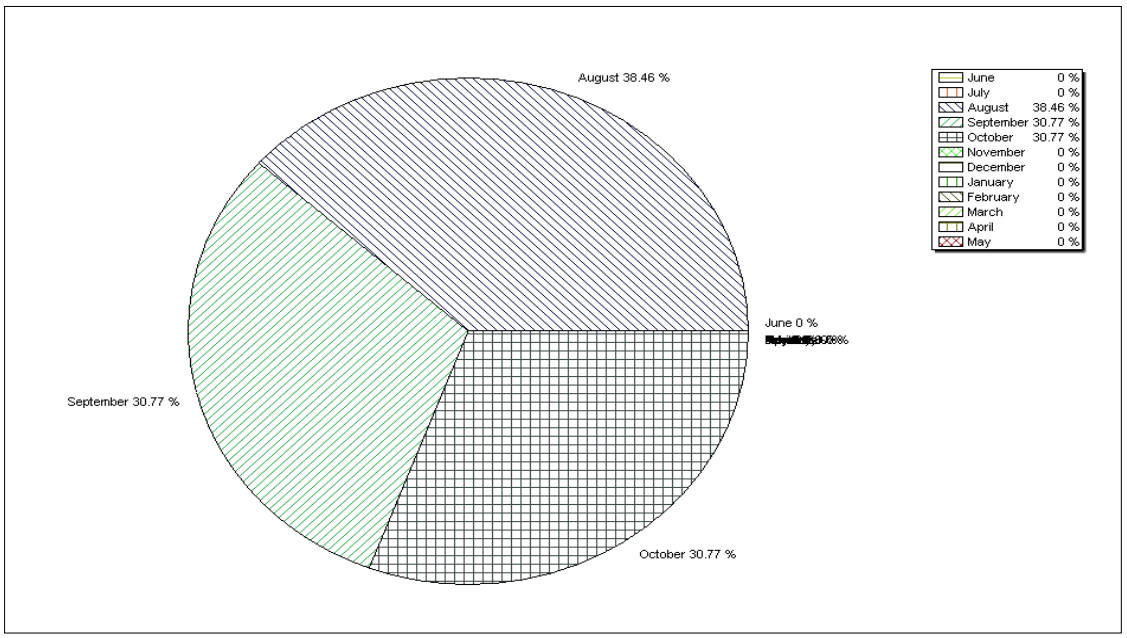
Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1990-2016



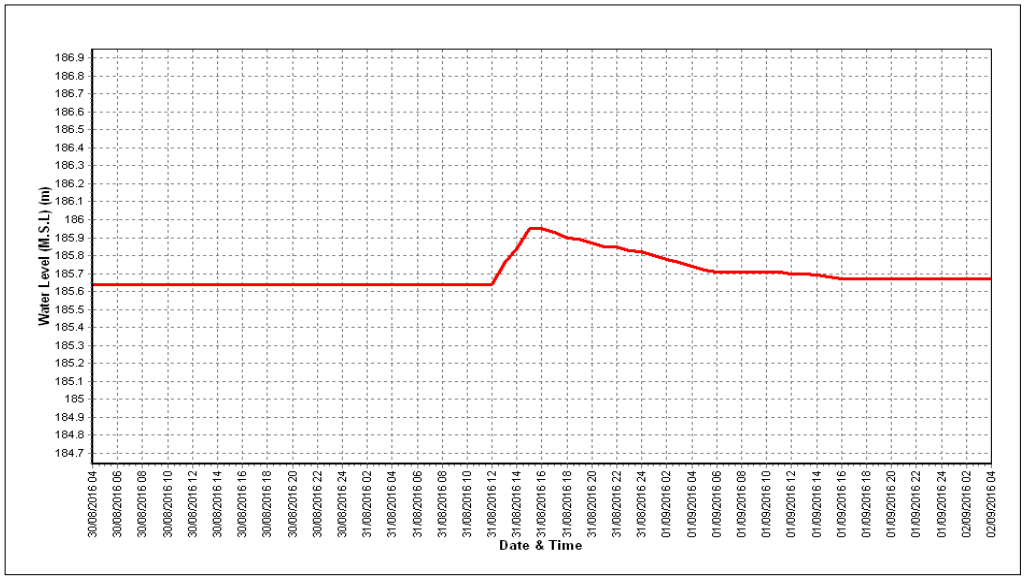
Monthly Runoff for the Year : 2016-2017



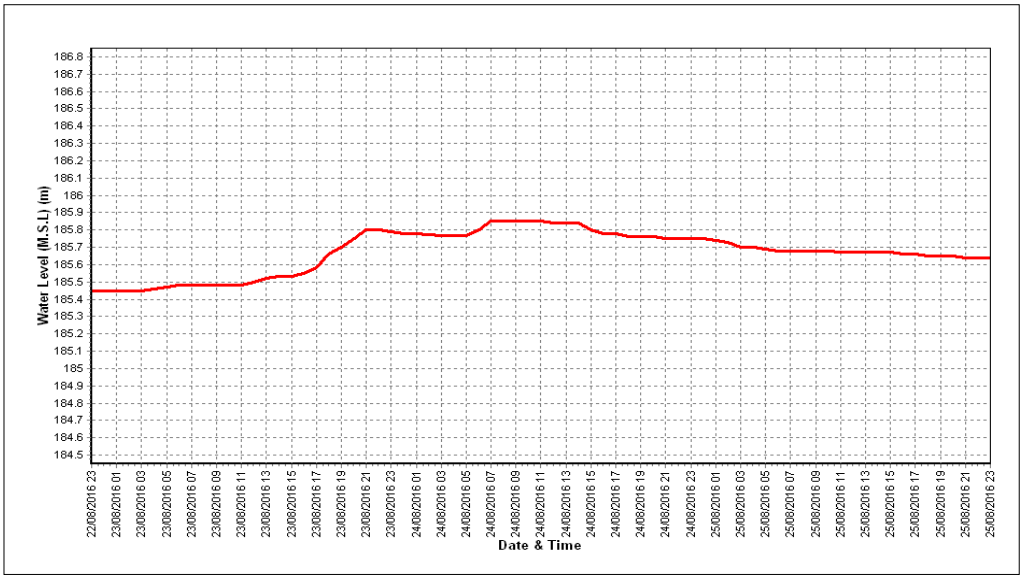
Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

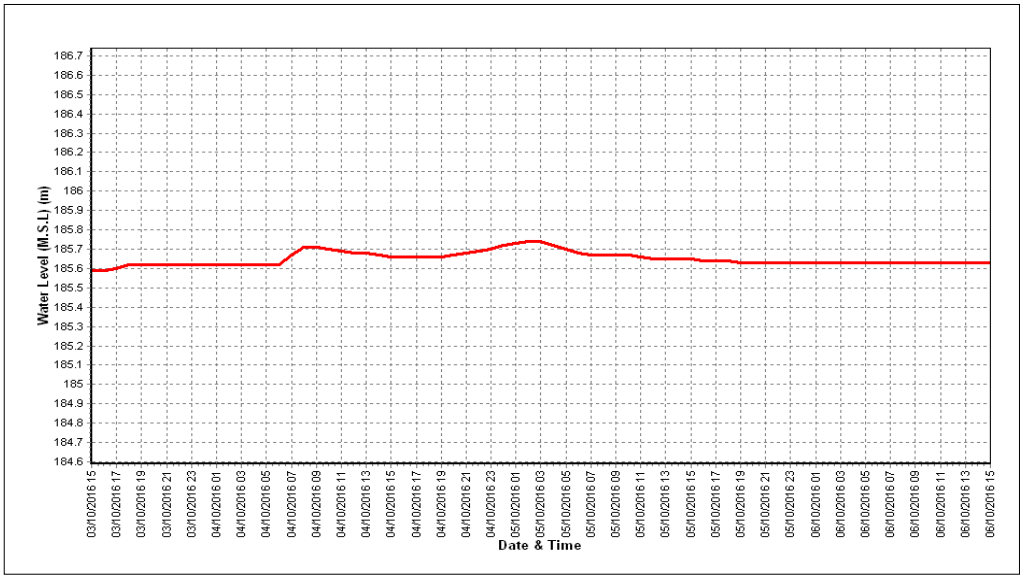
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

Water Year : 2016-17

Site	:	**Banas at Sarotry**	**Code**	:	**01 02 02 003**
State	:	Gujarat	District		Banaskantha
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Banas
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Banas
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	B.L.Sub Divn, Palanpur
Drainage Area	:	2200 Sq. Km.	Bank	:	Left
Latitude	:	24°22'04" N	Longitude	:	72°32'48" E
Zero of Gauge (m)	:	184 (m.s.l) 186 (m.s.l)	01/06/1980 01/08/1989	-	01/07/1989 -
		Opening Date	Closing Date		
Gauge	:	12/06/1980			
Discharge	:	01/06/1990			
Sediment	:	---			
Water Quality	:	--			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1989-1990	113.8	187.220	03/07/1989	0.000	River Dry	03/01/1990
1990-1991	1027	188.225	04/07/1990	0.000	River Dry	30/04/1991
1991-1992	194.4	187.305	23/07/1991	0.000	River Dry	17/06/1991
1992-1993	2672	190.780	08/09/1992	0.000	River Dry	02/07/1992
1993-1994	558.0	187.672	18/07/1993	0.000	River Dry	07/05/1994
1994-1995	1324	189.025	08/09/1994	0.000	River Dry	09/06/1994
1995-1996	339.3	188.220	25/07/1995	0.000	186.600	09/03/1996
1996-1997	44.34	187.565	29/07/1996	0.000	186.670	08/11/1996
1997-1998	360.0	188.325	14/09/1997	0.000	186.810	23/01/1998
1998-1999	111.0	187.700	18/10/1998	0.000	186.750	04/12/1998
1999-2000	154.0	187.910	22/06/1999	0.000	River Dry	08/11/1999
2000-2001	20.44	187.200	16/07/2000	0.000	River Dry	26/01/2001
2001-2002	26.27	187.200	15/06/2001	0.000	River Dry	23/11/2001
2002-2003	22.57	187.100	29/06/2002	0.000	River Dry	25/01/2003
2003-2004	244.0	187.950	19/06/2003	0.000	River Dry	31/12/2003
2004-2005	51.89	187.650	02/08/2004	0.000	River Dry	25/01/2005
2005-2006	213.0	188.050	19/09/2005	0.000	River Dry	01/06/2005
2006-2007	1008	188.750	07/09/2006	0.000	River Dry	01/06/2006
2007-2008	1158	186.010	04/07/2007	0.000	River Dry	01/06/2007
2008-2009	28.71	187.015	14/08/2008	0.000	River Dry	01/06/2008
2009-2010	14.03	186.860	24/07/2009	0.000	River Dry	01/06/2009
2010-2011	209.6	187.550	06/08/2010	0.000	River Dry	01/06/2010
2011-2012	1022.9	189.575	12/09/2011	0.000	River Dry	07/05/2012
2012-2013	882.0	188.900	11/07/2012	0.000	River Dry	01/06/2012
2013-2014	212.7	187.64	29/09/2013	0.000	River Dry	01/06/2013
2014-2015	61.16	187.25	30/07/2014	0.000	River Dry	01/06/2014
2015-2016	750.5	190.25	29/07/2015	0.000	186.150	27/10/2015
2016-2017	228	187.56	10/08/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

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	R. Dry	0.000	R. Dry	0.000	186.270	3.745	187.320	149.2	186.310	1.347	186.220	1.050 *
2	R. Dry	0.000	R. Dry	0.000	186.220	2.719	186.930	73.98	186.310	2.860 *	186.220	1.050 *
3	R. Dry	0.000	R. Dry	0.000	186.500	9.998	186.840	44.73 #	186.310	1.329	186.210	0.910 *
4	R. Dry	0.000	R. Dry	0.000	186.610	12.68	186.730	30.65 *	186.390	4.323	186.200	0.790 *
5	R. Dry	0.000	186.210	0.910 *	186.400	5.955	186.630	25.52	186.450	6.871	186.190	0.670 *
6	R. Dry	0.000	186.170	0.480 *	186.310	4.787	186.600	22.95	187.110	102.6	186.190	0.670 *
7	R. Dry	0.000	186.090	0.050 *	186.290	2.360 *	186.570	20.72	186.750	32.97 #	186.190	0.670 *
8	R. Dry	0.000	186.090	0.050 *	186.430	6.463	186.550	18.57	186.550	18.42	186.190	0.670 *
9	R. Dry	0.000	186.090	0.050 *	186.380	5.731	186.550	18.11	186.520	0.000	186.130	0.200 *
10	R. Dry	0.000	186.090	0.050 *	187.560	228.0	186.540	13.50 *	186.440	6.451	186.130	0.200 *
11	R. Dry	0.000	186.090	0.050 *	187.000	71.33 #	186.520	12.17 *	186.410	6.300 *	186.120	0.150 *
12	R. Dry	0.000	R. Dry	0.000	186.655	26.36	186.500	10.36	186.390	5.480 *	186.120	0.150 *
13	R. Dry	0.000	R. Dry	0.000	186.500	15.74	186.490	10.34 *	186.360	3.969	186.120	0.150 *
14	R. Dry	0.000	R. Dry	0.000	186.430	7.200 *	186.490	9.996	186.350	3.882	186.120	0.150 *
15	R. Dry	0.000	R. Dry	0.000	186.380	6.094	186.480	6.929	186.330	3.873	186.100	0.080 *
16	R. Dry	0.000	R. Dry	0.000	186.340	5.433	186.460	6.873	186.320	3.130 *	186.060	0.000
17	R. Dry	0.000	R. Dry	0.000	186.320	4.905	186.440	6.340	186.310	3.176	186.060	0.000
18	R. Dry	0.000	R. Dry	0.000	186.310	4.851	186.430	7.200 *	186.310	3.087	186.050	0.000
19	R. Dry	0.000	R. Dry	0.000	186.300	3.876	186.405	5.753	186.300	2.953	186.050	0.000
20	R. Dry	0.000	R. Dry	0.000	186.290	3.589	186.395	5.423	186.300	2.752	186.050	0.000
21	R. Dry	0.000	R. Dry	0.000	186.290	2.360 *	186.390	4.993	186.290	2.492	186.030	0.000
22	R. Dry	0.000	R. Dry	0.000	186.485	8.123	186.380	4.354	186.280	2.071	186.030	0.000
23	R. Dry	0.000	R. Dry	0.000	187.340	153.5	186.370	3.765	186.280	2.130 *	186.030	0.000
24	R. Dry	0.000	R. Dry	0.000	187.240	129.7	186.360	3.246	186.260	1.599	186.030	0.000
25	R. Dry	0.000	R. Dry	0.000	187.100	106.3	186.360	0.000	186.260	1.720 *	186.020	0.000
26	R. Dry	0.000	R. Dry	0.000	186.640	14.02	186.350	2.956	186.250	1.368	186.020	0.000
27	R. Dry	0.000	R. Dry	0.000	186.980	67.58 #	186.350	2.937	186.250	1.310	186.020	0.000
28	R. Dry	0.000	R. Dry	0.000	186.750	32.97 *	186.340	2.517	186.240	1.141	186.020	0.000
29	R. Dry	0.000	R. Dry	0.000	186.680	30.27	186.330	2.074	186.240	1.360 *	186.020	0.000
30	R. Dry	0.000	R. Dry	0.000	186.920	57.08 #	186.320	1.701	186.240	1.360 *	186.020	0.000
31			R. Dry	0.000	187.060	83.32 #			186.240	1.360 *		
Ten-Daily Mean												
I Ten-Daily	R. Dry	0.000	186.123	0.265	186.497	28.24	186.726	41.79	186.514	17.72	186.187	0.688
II Ten-Daily	R. Dry	0.000	186.090	0.050	186.453	14.94	186.461	8.138	186.338	3.860	186.085	0.068
III Ten-Daily	R. Dry	0.000	R.D	0.000	186.862	62.29	186.355	2.854	186.257	1.628	186.024	0.000
Monthly												
Min.	R. Dry	0.000	186.090	0.050	186.220	2.360	186.320	0.000	186.240	0.000	186.020	0.000
Max.	R. Dry	0.000	186.210	0.910	187.560	228.0	187.320	149.2	187.110	102.6	186.220	1.050
Mean	R. Dry	0.000	186.119	0.234	186.612	36.03	186.514	17.59	186.366	7.538	186.099	0.252

Annual Runoff in MCM = 163 Annual Runoff in mm = 74

Peak Observed Discharge = 228.0 cumecs on 10/08/2016 Corres. Water Level :187.56 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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 Data for the period 2016 - 2017

Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
2	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
3	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
4	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
5	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
6	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
7	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
8	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
9	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
10	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
11	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
12	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
13	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
14	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
15	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
16	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
17	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
18	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
19	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
20	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
21	186.010	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
22	186.010	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
23	186.010	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
24	186.010	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
25	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
26	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
27	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
28	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
29	186.010	0.000	R. Dry	0.000			R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
30	186.010	0.000	R. Dry	0.000			R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
31	186.010	0.000	R. Dry	0.000			R. Dry	0.001			R. Dry	0.001
Ten-Daily Mean												
I Ten-Daily	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
II Ten-Daily	186.020	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
III Ten-Daily	186.010	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
Monthly												
Min.	186.010	0.000	186.010	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
Max.	186.020	0.000	186.880	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000
Mean	186.016	0.000	186.155	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000	R. Dry	0.000

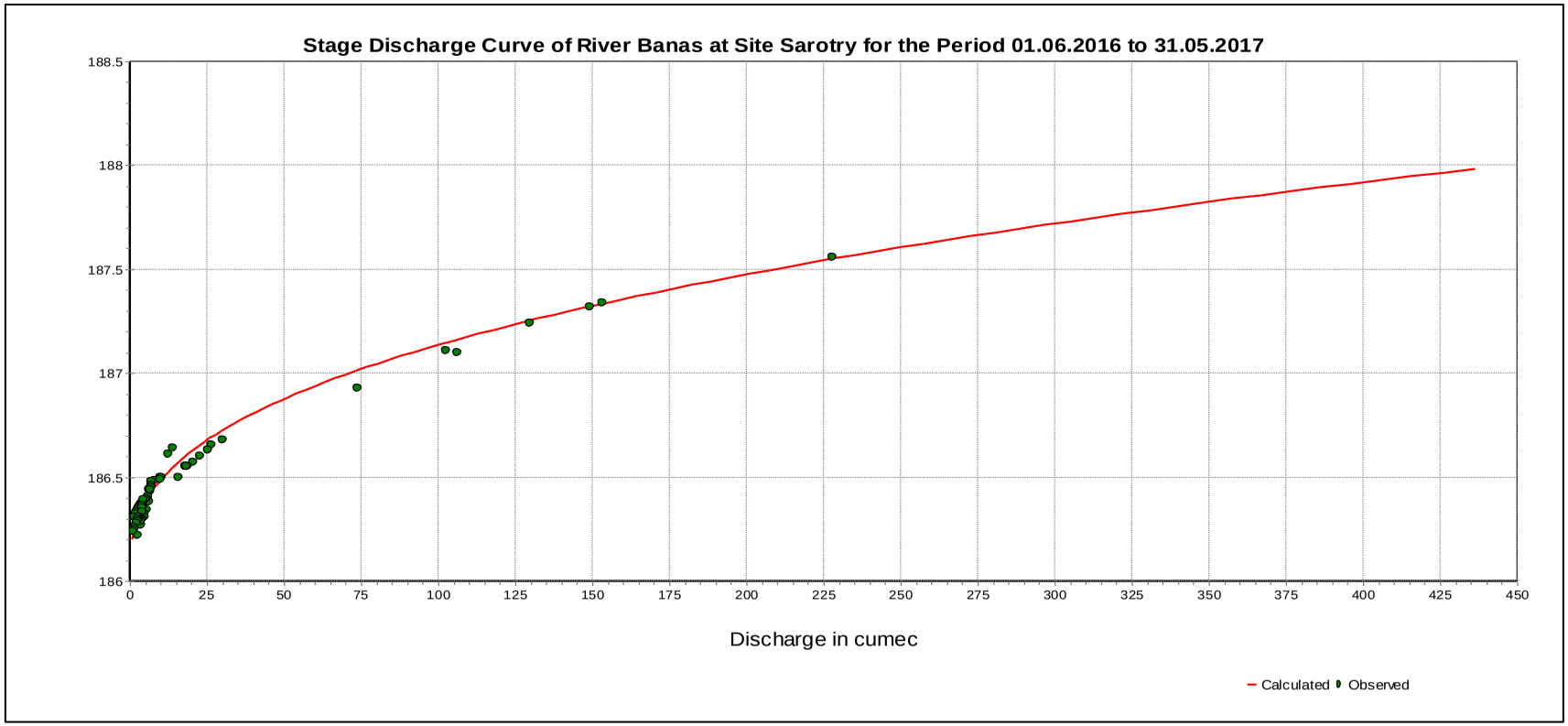
Peak Computed Discharge = 32.97 cumecs on 28/08/2016 Corres. Water Level :186.75 m

Lowest Computed Discharge = 0.050 cumecs on 07/07/2016 Corres. Water Level :186.09 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



Procedure - Standard

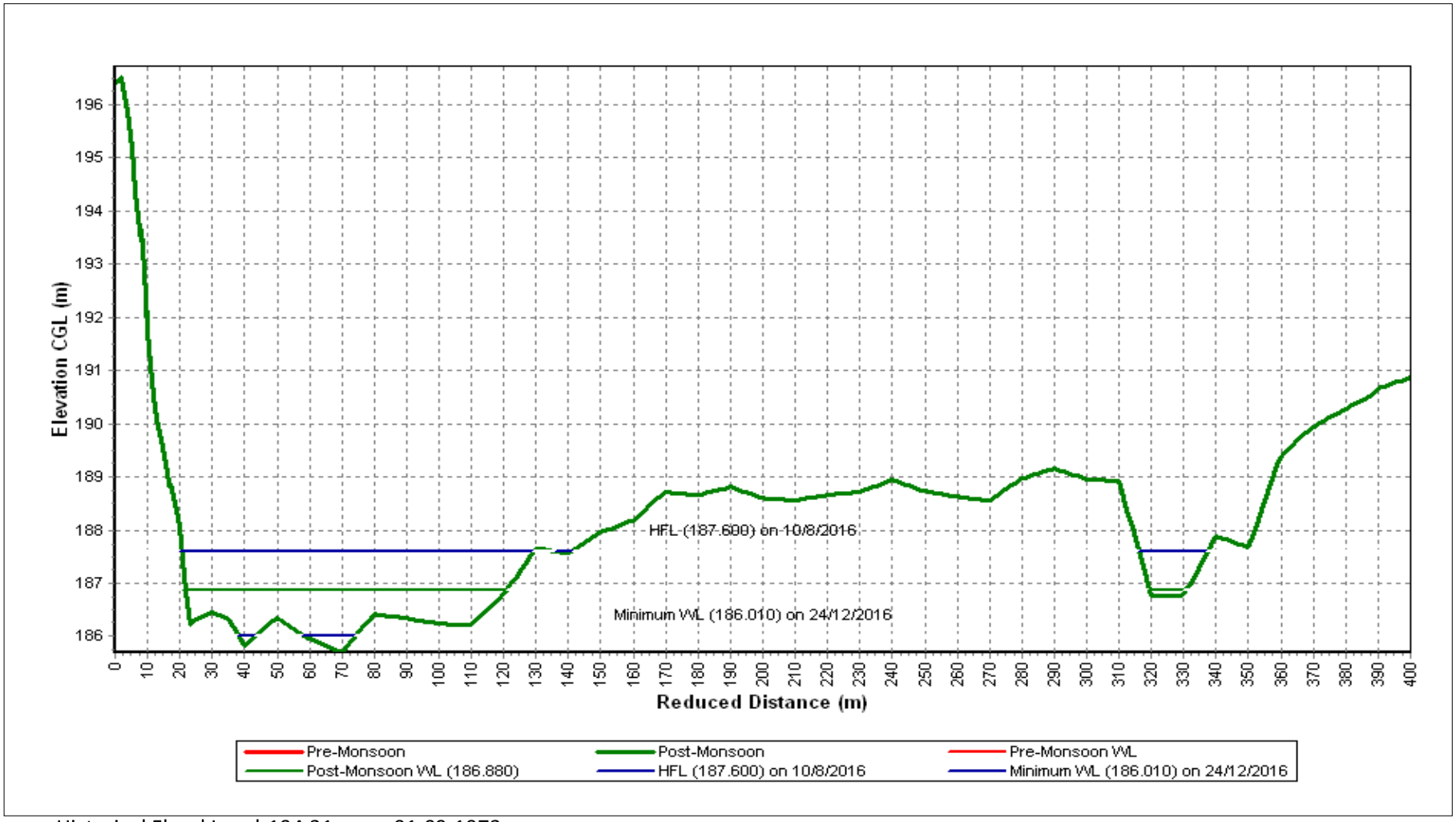
Equation Type - Power $Q=c*(h+a)^{b}$

LB	UB	a	b	c
186.2	188	-186.03	2.589	77.179

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

Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**



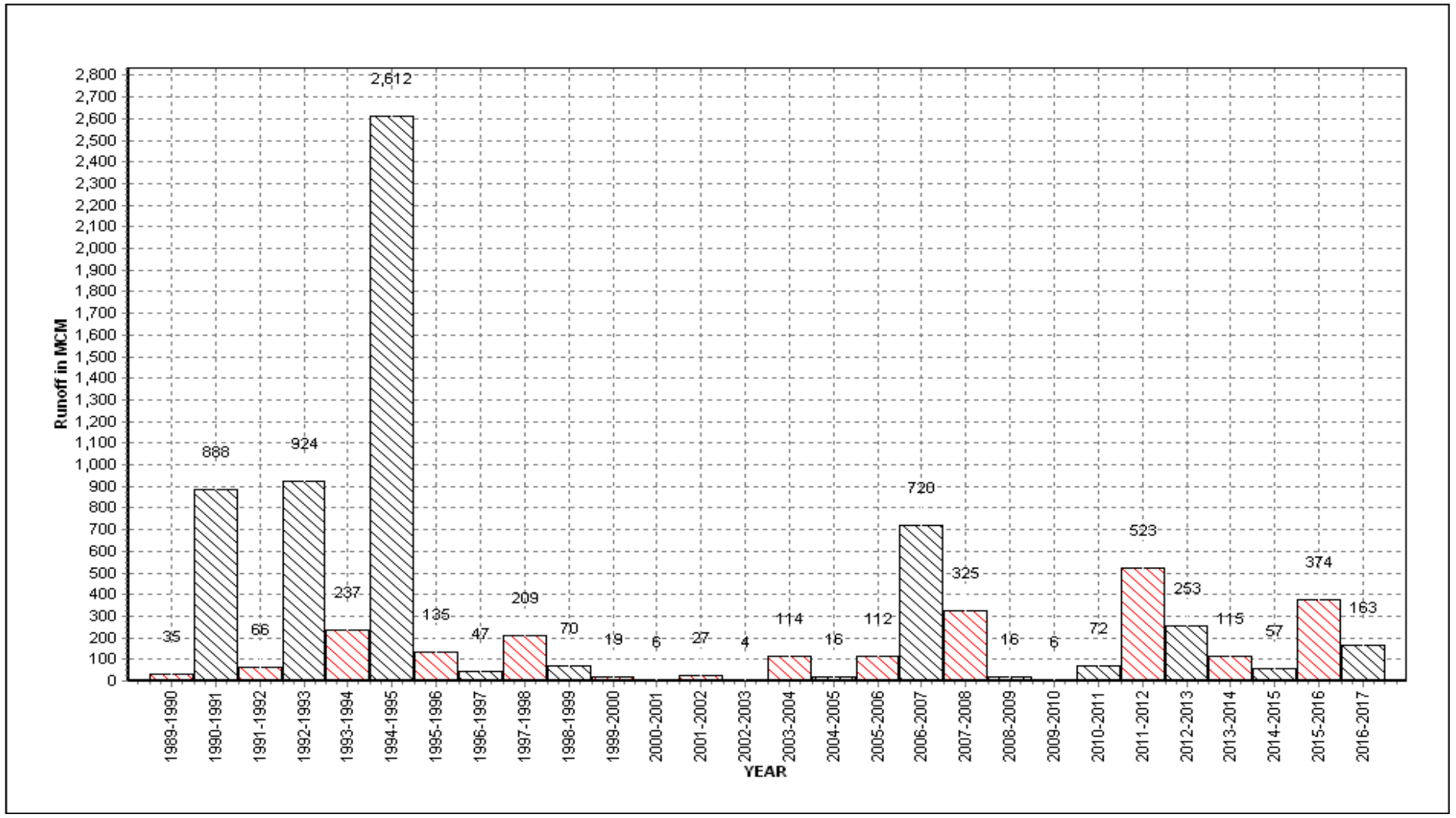
Historical Flood Level-194.31 m on 01.09.1973

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1989 - 2017

Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

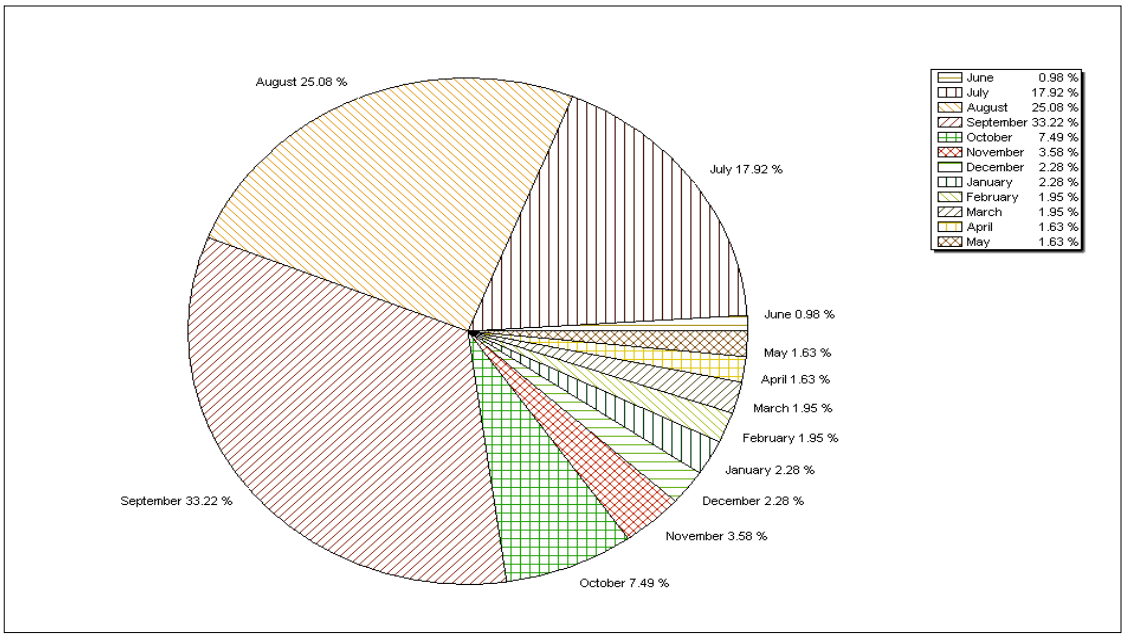


Note: Missing values have not been considered while arriving at Annual Runoff

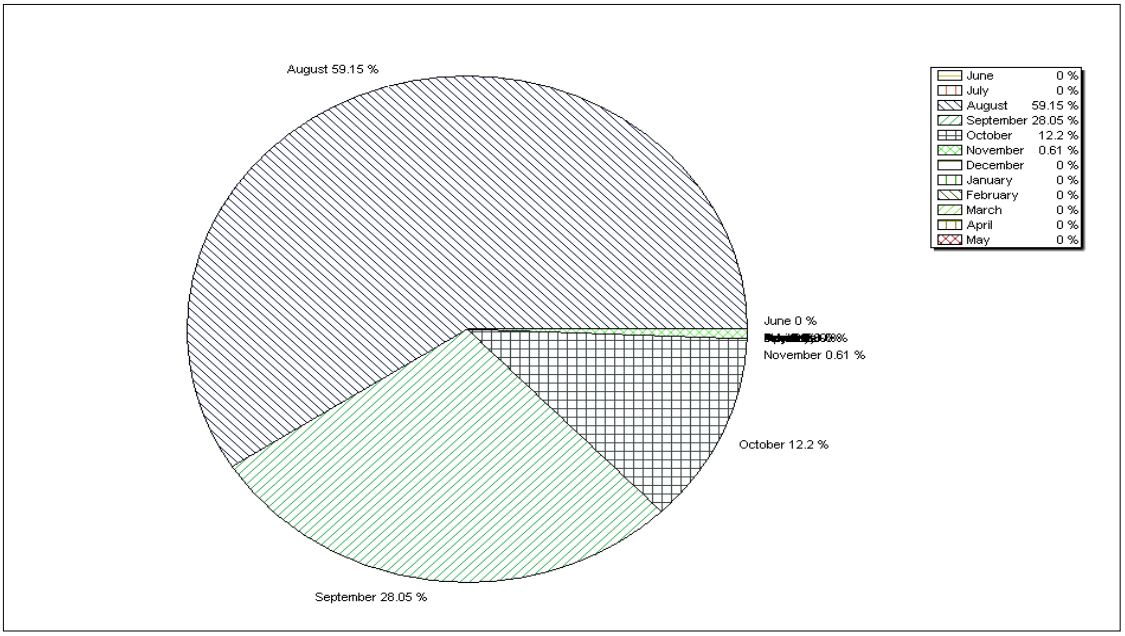
Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1989-2016



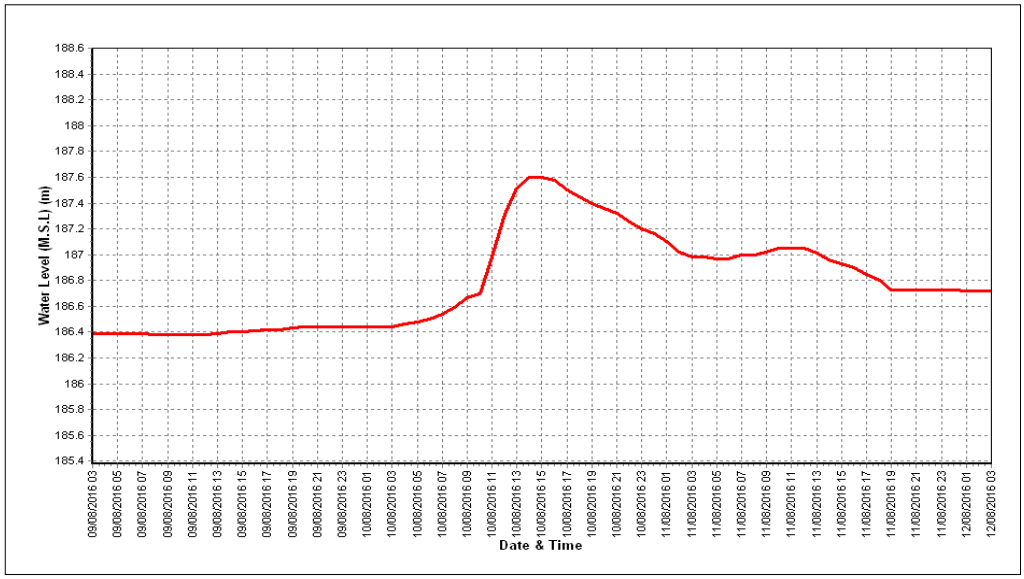
Monthly Runoff for the Year : 2016-2017



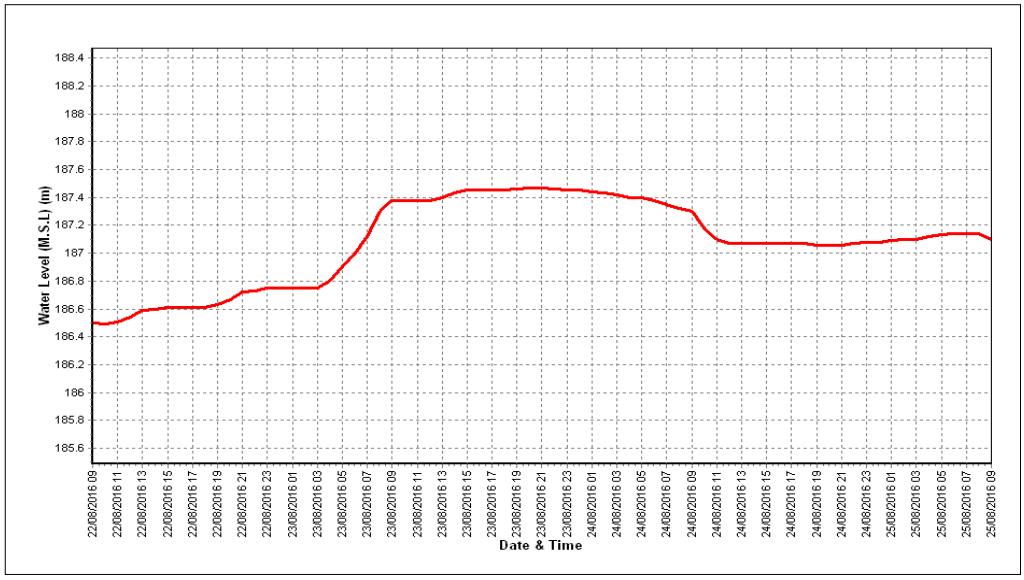
Station Name : Banas at Sarotry (01 02 02 003) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

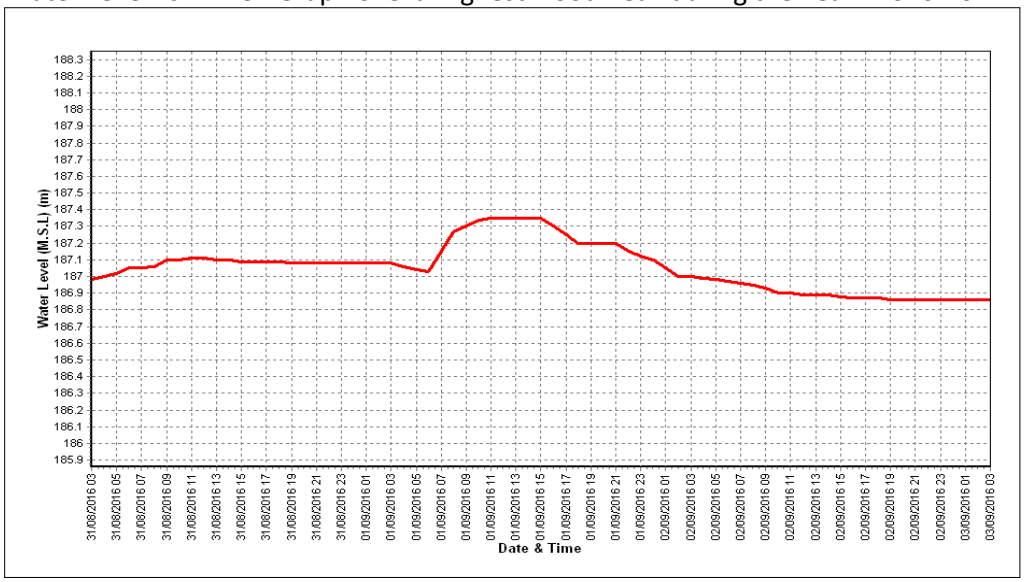
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Banas at Abu Road**	**Code**	:	**01 02 02 002**
State	:	Rajasthan	District		Sirohi
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Banas
Tributary	:	-	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Banas
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	B.L.Sub Divn, Palanpur
Drainage Area	:	1600 Sq. Km.	Bank	:	Right
Latitude	:	24°29'38" N	Longitude	:	72°47'30" E
Zero of Gauge (m)	:	254.85 (m.s.l)	10/05/1978		
		Opening Date	Closing Date		
Gauge	:	10/05/1978			
Discharge	:	01/06/1990			
Sediment	:	--			
Water Quality	:	01/07/1988			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1989-1990	53.42	255.918	26/08/1989	0.000	River Dry	25/01/1990
1990-1991	526.9	257.712	05/08/1990	0.000	River Dry	05/06/1990
1991-1992	38.71	256.890	26/07/1991	0.000	River Dry	26/01/1992
1992-1993	1164	258.397	08/09/1992	0.000	River Dry	25/06/1992
1993-1994	170.4	256.519	18/07/1993	0.000	River Dry	07/05/1994
1994-1995	1030	257.490	20/08/1994	0.000	River Dry	12/06/1994
1995-1996	327.0	256.450	25/07/1995	0.000	River Dry	26/01/1996
1996-1997	56.52	255.870	29/07/1996	0.000	River Dry	04/12/1996
1997-1998	96.00	256.150	02/08/1997	0.000	River Dry	27/01/1998
1998-1999	93.00	255.900	17/10/1998	0.000	River Dry	25/01/1999
1999-2000	34.55	255.265	22/06/1999	0.000	River Dry	03/02/2000
2000-2001	32.29	255.725	16/07/2000	0.000	River Dry	25/01/2001
2001-2002	46.77	255.675	04/07/2001	0.000	River Dry	05/12/2001
2002-2003	4.243	254.785	09/08/2002	0.000	River Dry	25/01/2003
2003-2004	72.55	255.590	29/07/2003	0.000	254.360	27/10/2003
2004-2005	20.38	255.000	02/08/2004	0.000	River Dry	30/05/2005
2005-2006	149.5	255.670	19/09/2005	0.000	River Dry	01/06/2005
2006-2007	585.8	256.985	20/08/2006	0.000	River Dry	01/06/2006
2007-2008	471.3	256.650	04/07/2007	0.000	253.780	01/06/2007
2008-2009	13.92	254.640	14/08/2008	0.000	River Dry	01/06/2008
2009-2010	11.57	254.640	14/08/2008	0.000	River Dry	01/06/2009
2010-2011	40.87	254.600	13/09/2010	0.000	River Dry	01/06/2010
2011-2012	338.2	258.200	09/08/2011	0.000	253.500	26/05/2012
2012-2013	347.5	257.750	08/09/2012	0.000	253.500	31/05/2013
2013-2014	118.1	255.35	29/09/2013	0.000	River Dry	01/06/2013
2014-2015	7.346	254.15	16/07/2014	0.000	River Dry	01/06/2014
2015-2016	29.38	254.56	25/06/2015	0.000	253.650	01/11/2015
2016-2017	59.27	255.475	10/08/2016	0.000	253.58	27/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.DRY	0.000	253.800	0.450 *	254.030	2.256	254.600	15.80 *	253.830	0.660 *	253.800	0.450 *
2	R.DRY	0.000	253.620	0.000	253.940	1.987	254.710	13.26	253.820	0.590 *	253.780	0.330 *
3	R.DRY	0.000	253.620	0.000	253.910	1.870	254.586	10.81	253.810	0.520 *	253.760	0.230 *
4	R.DRY	0.000	255.350	46.36	254.069	2.375	254.440	12.21	253.810	0.520 *	253.740	0.140 *
5	R.DRY	0.000	253.910	1.380 #	254.000	2.048	254.400	10.71	254.190	5.580 *	253.720	0.070 *
6	R.DRY	0.000	253.690	0.000	253.960	1.950	254.310	9.769	254.750	20.64 *	253.720	0.070 *
7	R.DRY	0.000	253.600	0.000	254.310	7.990 #	254.280	9.272	254.405	9.937	253.720	0.070 *
8	R.DRY	0.000	253.570	0.000	254.090	3.476	254.255	8.819	254.185	8.370	253.720	0.070 *
9	R.DRY	0.000	253.550	0.000	254.099	4.853	254.230	8.587	254.110	4.276	253.720	0.070 *
10	R.DRY	0.000	253.530	0.000	255.475	59.27	254.190	8.135	254.060	3.666	253.720	0.070 *
11	R.DRY	0.000	253.530	0.000	254.705	12.45	254.150	7.418	254.040	3.258	253.700	0.000
12	R.DRY	0.000	253.530	0.000	254.300	9.593	254.120	7.031	254.000	2.460 *	253.700	0.000
13	R.DRY	0.000	253.530	0.000	254.090	4.314	254.120	5.105	253.980	1.899	253.700	0.000
14	R.DRY	0.000	253.530	0.000	254.080	3.846	254.100	3.952	253.940	1.220	253.700	0.000
15	R.DRY	0.000	253.530	0.000	254.050	3.117	254.100	4.105	253.900	1.214	253.700	0.000
16	R.DRY	0.000	R.DRY	0.000	254.030	3.051	254.100	4.005	253.880	1.275	253.700	0.000
17	R.DRY	0.000	R.DRY	0.000	254.000	2.323	254.100	3.996	253.860	0.911	253.700	0.000
18	R.DRY	0.000	R.DRY	0.000	253.970	2.010	254.070	3.648	253.860	0.918	253.700	0.000
19	R.DRY	0.000	R.DRY	0.000	253.900	1.598	254.050	3.354	253.860	0.910 *	253.700	0.000
20	R.DRY	0.000	R.DRY	0.000	253.940	1.754	254.020	3.298	253.860	0.910 *	253.700	0.000
21	R.DRY	0.000	R.DRY	0.000	253.960	1.895	254.000	2.449	253.850	0.700	253.680	0.000
22	R.DRY	0.000	R.DRY	0.000	254.365	10.79	253.972	1.831	253.850	0.932	253.680	0.000
23	R.DRY	0.000	R.DRY	0.000	255.360	40.48	253.960	2.001	253.840	0.859	253.680	0.000
24	253.880	1.090 *	R.DRY	0.000	255.100	34.06 *	253.940	1.812	253.838	0.787	253.680	0.000 *
25	253.780	0.330 *	R.DRY	0.000	254.850	24.17 *	253.930	1.159	253.825	0.681	253.680	0.000 *
26	253.696	0.020 *	R.DRY	0.000	254.450	11.54 *	253.910	1.137	253.810	0.520 *	253.680	0.000 *
27	253.580	0.000	R.DRY	0.000	254.720	14.46	253.900	0.914	253.810	0.520 *	253.680	0.000 *
28	253.540	0.000	R.DRY	0.000	254.490	12.30	253.880	0.858	253.800	0.450 *	253.680	0.000 *
29	253.540	0.000	253.800	0.450 #	254.675	13.28	253.870	0.646	253.800	0.450 *	253.680	0.000 *
30	254.300	7.870 *	254.045	2.838	254.850	24.17 *	253.850	0.637	253.800	0.450 *	253.680	0.000 *
31			254.095	3.384	255.000	29.93 *			253.800	0.450 *		
Ten-Daily Mean												
I Ten-Daily	R.DRY	0.000	253.824	4.819	254.188	8.808	254.400	10.74	254.097	5.476	253.740	0.157
II Ten-Daily	R.DRY	0.000	253.530	0.000	254.106	4.406	254.093	4.591	253.918	1.498	253.700	0.000
III Ten-Daily	253.759	1.330	253.980	2.224	254.711	19.73	253.921	1.344	253.820	0.618	253.680	0.000
Monthly												
Min.	253.540	0.000	253.530	0.000	253.900	1.598	253.850	0.637	253.800	0.450	253.680	0.000
Max.	254.300	7.870	255.350	46.36	255.475	59.27	254.710	15.80	254.750	20.64	253.800	0.450
Mean	253.759	1.33	253.768	3.048	254.347	11.26	254.138	5.558	253.941	2.469	253.707	0.052

Annual Runoff in MCM = 57 Annual Runoff in mm = 36

Peak Observed Discharge = 59.27 cumecs on 10/08/2016 Corres. Water Level :255.475 m

Lowest Observed Discharge = 0.000 cumecs on 27/06/2016 Corres. Water Level :253.58 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 Data for the period 2016 - 2017

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May		
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q	
1	253.680	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
2	253.680	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
3	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
4	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
5	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
6	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
7	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	*
8	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
9	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
10	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
11	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
12	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
13	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
14	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
15	253.680	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
16	253.620	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
17	253.620	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
18	253.620	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
19	253.620	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
20	253.620	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
21	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
22	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
23	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
24	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
25	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
26	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
27	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
28	253.560	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
29	253.560	0.000	R.DRY	0.000			R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
30	253.560	0.000	R.DRY	0.000			R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
31	253.530	0.000	R.DRY	0.000			R.DRY	0.000			R.DRY	0.000	
Ten-Daily Mean													
I Ten-Daily	253.680	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
II Ten-Daily	253.650	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
III Ten-Daily	253.557	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
Monthly													
Min.	253.530	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
Max.	253.680	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	
Mean	253.627	0.000	253.530	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	R.DRY	0.000	

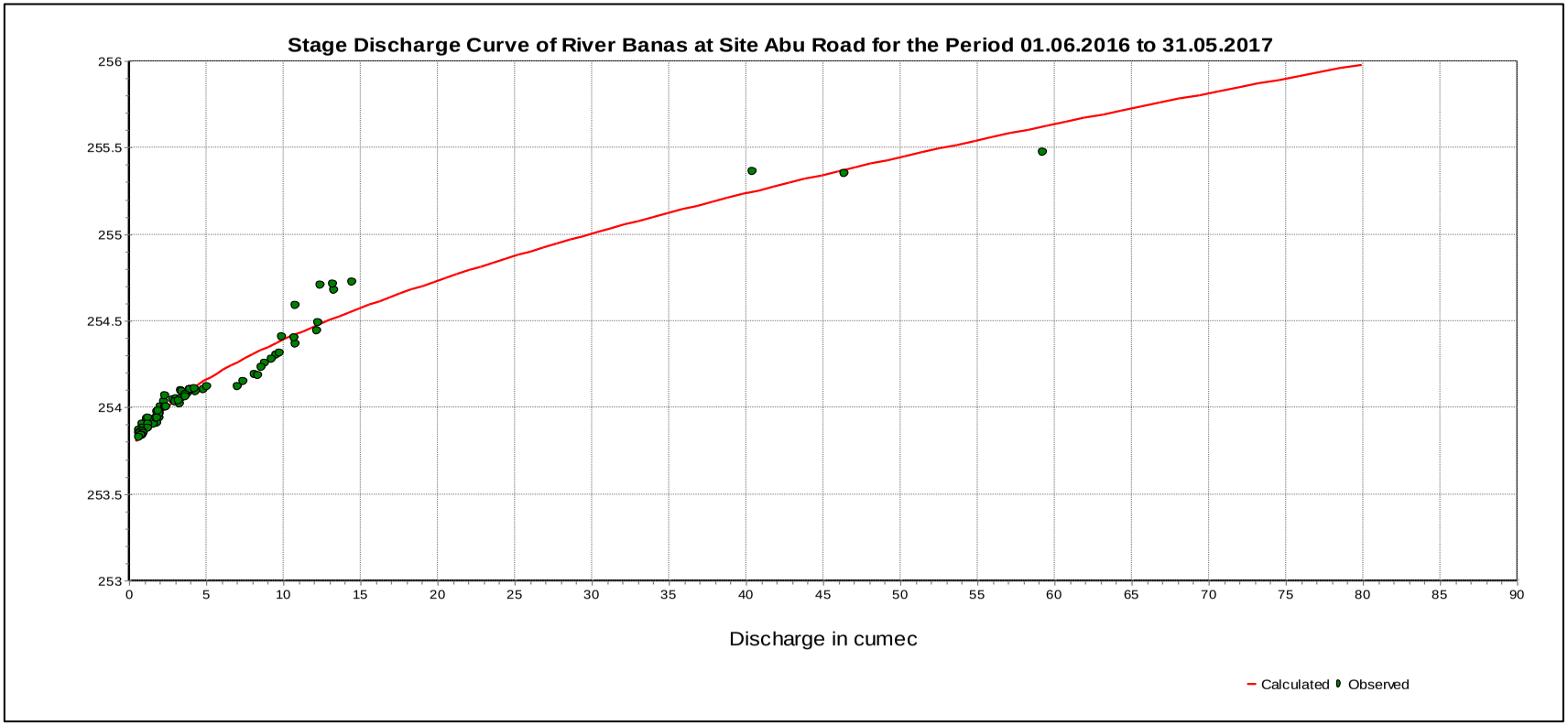
Peak Computed Discharge = 34.06 cumecs on 24/08/2016 Corres. Water Level :255.1 m

Lowest Computed Discharge = 0.000 cumecs on 24/11/2016 Corres. Water Level :253.68 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



Procedure - Standard

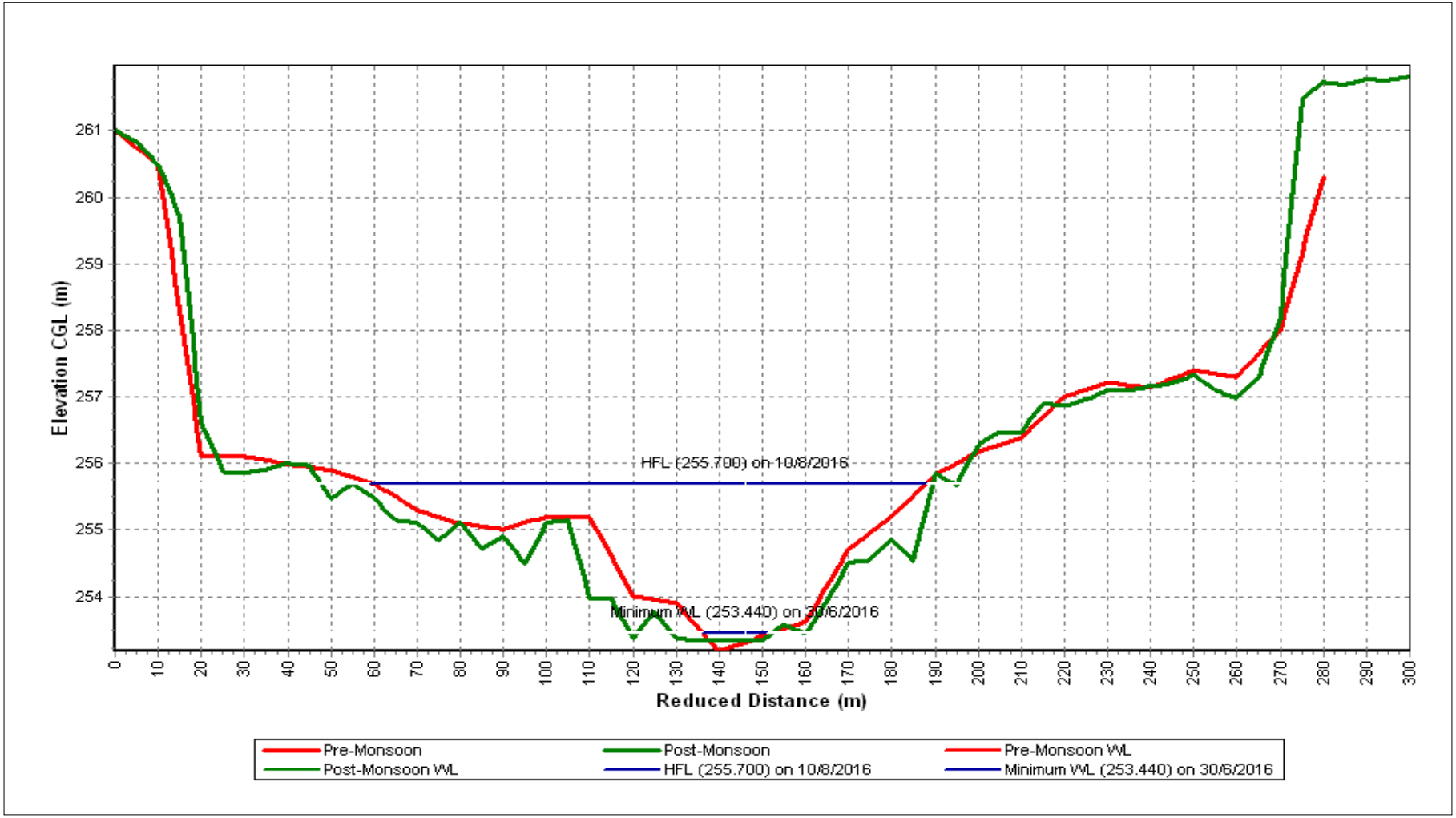
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
253.8	256	-253.675	1.777	18.151

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

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**



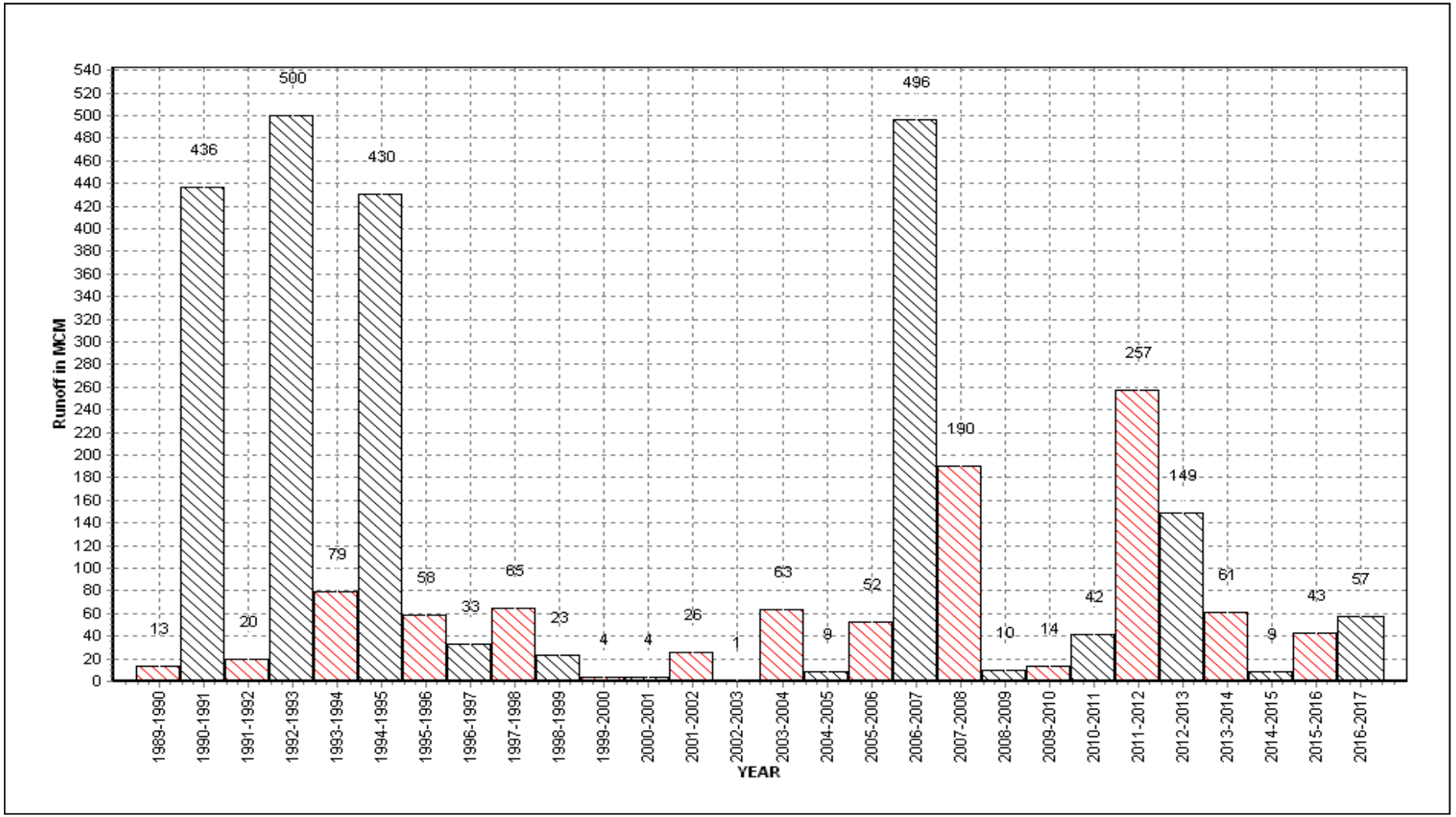
Historic Flood Level -265.400m on 31.08.1973

Note: HFL marked on graph denotes Max Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1989 - 2017

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

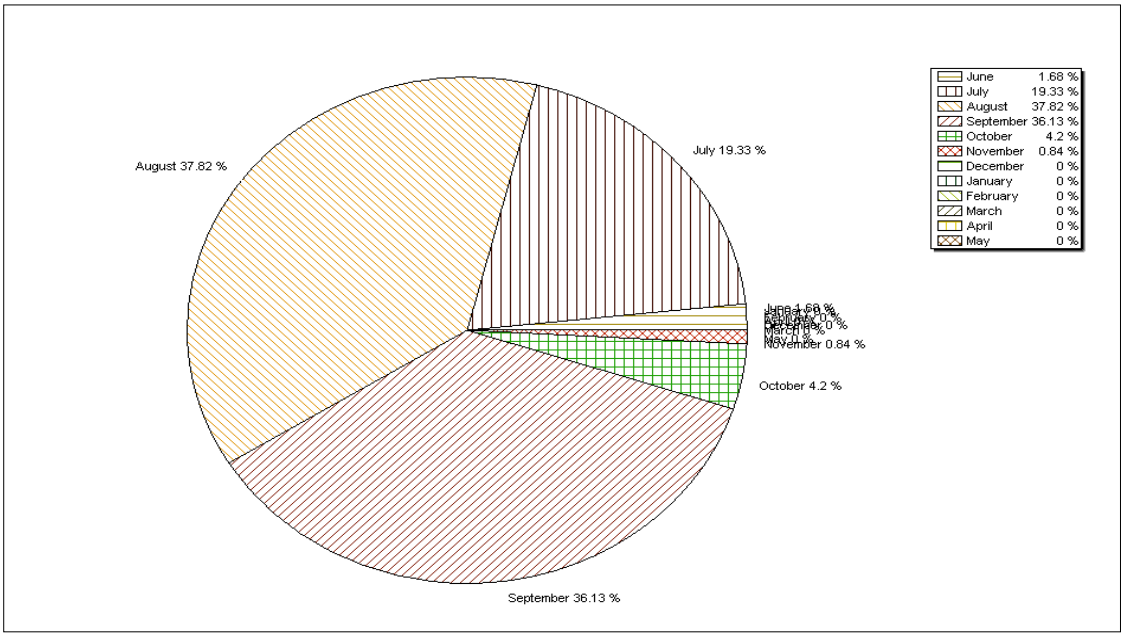


Note: Missing values have not been considered while arriving at Annual Runoff

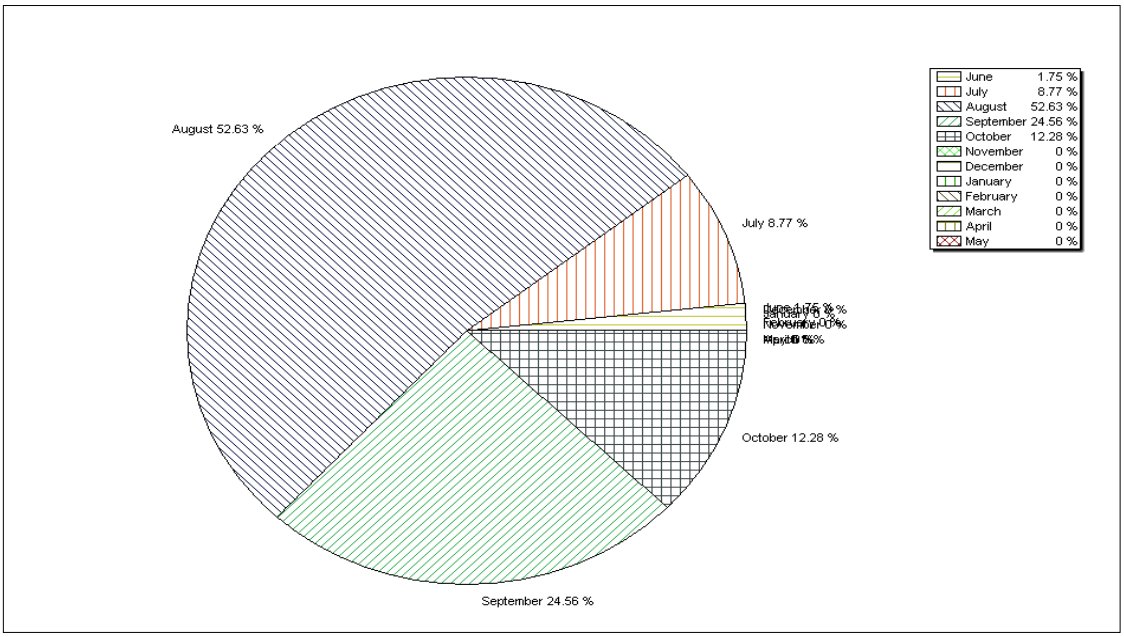
Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1989-2016



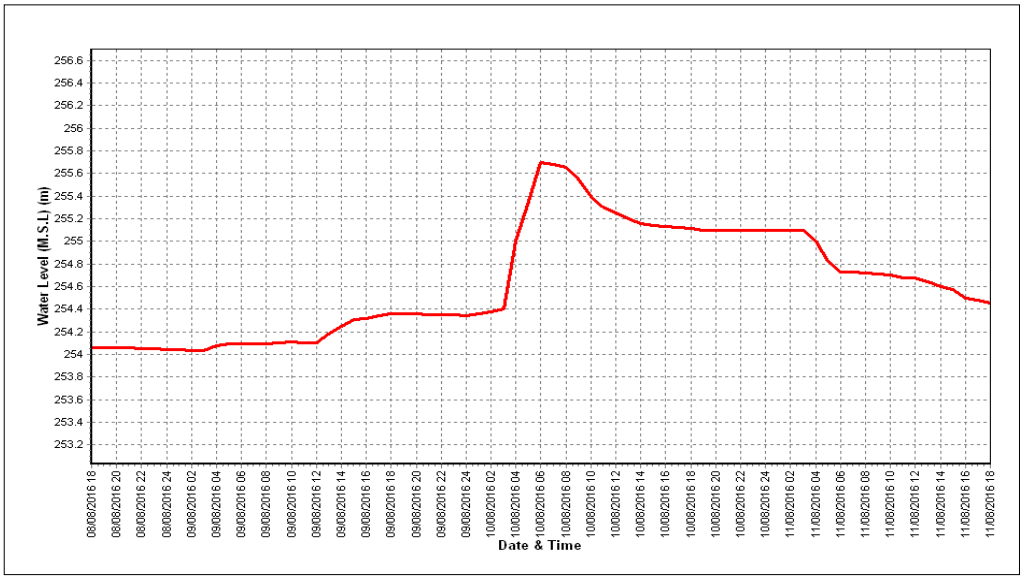
Monthly Runoff for the Year : 2016-2017



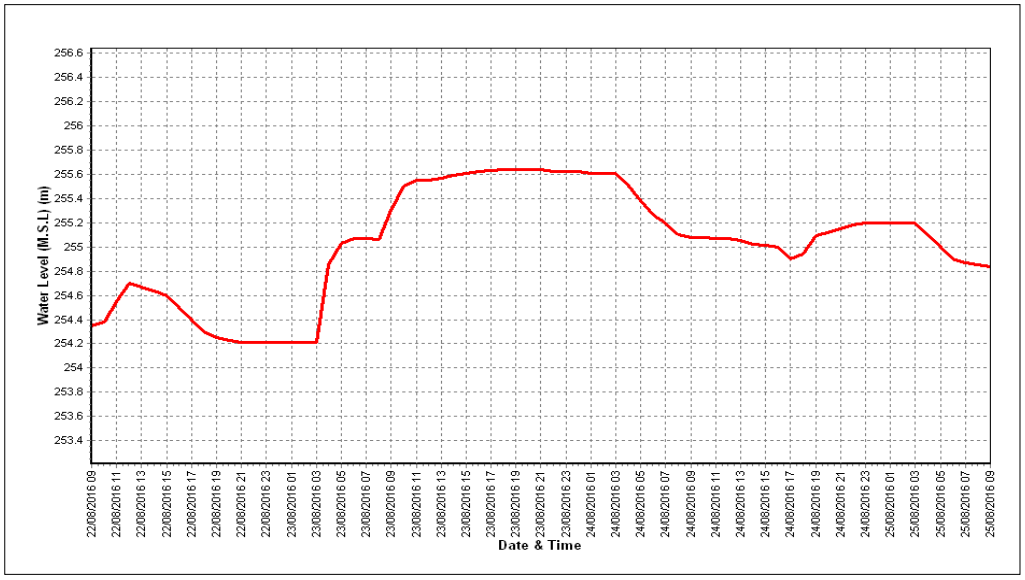
Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

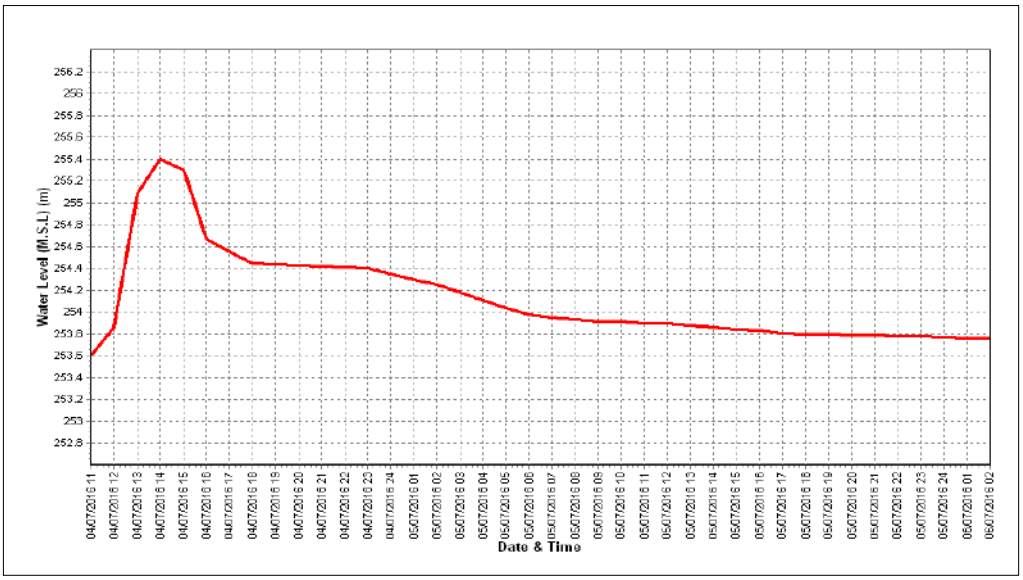
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Shetrunji at Lowara**	**Code**	:	**01 02 09 001**
State	:	Gujarat	District		Bhavnagar
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Shetrunji
Tributary	:	Shetrunji	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Shetrunji
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	3953 Sq. Km.	Bank	:	Left
Latitude	:	21°26'36" N	Longitude	:	71°33'42" E
Zero of Gauge (m)	:	56 (m.s.l)	01/02/1991	-	-
		Opening Date	Closing Date		
Gauge	:	29/11/1970			
Discharge	:	29/11/1970			
Sediment	:	25/07/1973			
Water Quality	:	01/07/1977			

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1971-1972	660.0	61.740	01/09/1971	0.000	57.240	15/06/1971
1972-1973	0.000	57.325	24/06/1972	0.000	River Dry	20/01/1973
1973-1974	620.0	62.980	27/09/1973	0.000	River Dry	10/05/1974
1974-1975	587.4	62.150	06/07/1974	0.000	River Dry	25/01/1975
1975-1976	169.7	60.350	02/08/1975	0.000	River Dry	29/01/1976
1976-1977	151.9	60.410	18/07/1976	0.000	River Dry	21/06/1976
1977-1978	352.1	61.400	03/09/1977	0.000	River Dry	09/04/1978
1978-1979	76.40	58.553	30/08/1978	0.000	River Dry	12/06/1978
1979-1980	710.0	65.225	11/08/1979	0.000	57.040	10/02/1980
1980-1981	610.0	64.150	03/07/1980	0.000	River Dry	23/01/1981
1981-1982	472.0	62.800	24/07/1981	0.000	River Dry	22/05/1982
1982-1983	880.0	66.930	09/11/1982	0.000	River Dry	07/04/1983
1983-1984	932.0	66.630	20/07/1983	0.000	River Dry	19/06/1983
1984-1985	76.50	58.455	15/09/1984	0.000	River Dry	21/03/1985
1985-1986	82.40	58.635	19/07/1985	0.000	River Dry	12/01/1986
1986-1987	615.0	62.110	25/06/1986	0.000	River Dry	30/12/1986
1987-1988	167.9	59.450	21/08/1987	0.000	River Dry	31/12/1987
1988-1989	870.0	64.020	28/07/1988	0.000	River Dry	05/12/1988
1989-1990	900.0	62.930	24/07/1989	0.000	River Dry	11/03/1990
1990-1991	407.1	61.630	17/08/1990	0.000	River Dry	25/04/1991
1991-1992	446.2	59.660	28/07/1991	0.000	River Dry	16/12/1991
1992-1993	268.4	59.550	04/09/1992	0.000	River Dry	04/02/1993

1993-1994	476.2	61.360	25/09/1993	0.000	River Dry	01/12/1993
1994-1995	722.7	62.298	31/08/1994	0.000	56.690	12/02/1995
1995-1996	185.9	59.110	02/09/1995	0.000	River Dry	08/04/1996
1996-1997	442.0	62.600	20/06/1996	0.000	River Dry	05/03/1997
1997-1998	77.00	58.440	04/07/1997	0.000	River Dry	24/11/1997
1998-1999	546.0	63.000	28/08/1998	0.000	River Dry	25/01/1999
1999-2000	84.00	58.100	03/10/1999	0.000	River Dry	13/01/2000
2000-2001	5.500	57.025	24/08/2000	0.000	River Dry	25/01/2001
2001-2002	602.0	60.425	17/06/2001	0.000	River Dry	25/01/2002
2002-2003	2075	64.080	29/06/2002	0.000	River Dry	25/01/2003
2003-2004	554.9	60.240	07/08/2003	0.000	River Dry	02/02/2004
2004-2005	1010	61.440	06/08/2004	0.000	River Dry	11/02/2005
2005-2006	2441	64.350	29/06/2005	0.000	River Dry	01/06/2005
2006-2007	880.9	60.800	30/07/2006	0.000	River Dry	01/06/2006
2007-2008	809.4	60.900	26/09/2007	0.000	River Dry	01/06/2007
2008-2009	1027	61.120	29/07/2008	0.000	River Dry	01/06/2008
2009-2010	417	60.150	18/07/2009	0.000	River Dry	01/06/2009
2010-2011	713.5	60.300	01/09/2010	0.000	River Dry	01/06/2010
2011-2012	854.8	61.380	18/07/2011	0.000	River Dry	08/07/2011
2012-2013	220.0	58.690	03/09/2012	0.000	River Dry	25/06/2012
2013-2014	1759	63.1	03/08/2013	0.000	River Dry	01/06/2013
2014-2015	340.9	59.18	02/09/2014	0.000	River Dry	01/06/2014
2015-2016	407.4	59.475	24/06/2015	0.000	River Dry	01/06/2015

Stage-Discharge Data for the period 2016 - 2017

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	R. Dry	0.000	56.310	0.000 *	56.375	0.110 *	56.447	0.693	56.510	1.107	56.500	0.840
2	R. Dry	0.000	56.800	6.425	56.360	0.070 *	56.410	0.705	56.510	1.150 *	56.500	0.828
3	R. Dry	0.000	57.360	50.47	56.350	0.000 *	56.420	0.449	56.520	1.145	56.495	0.802
4	R. Dry	0.000	57.270	45.31	56.330	0.000 *	56.395	0.200 *	56.580	1.893	56.495	0.791
5	R. Dry	0.000	56.630	3.164	56.555	1.432	56.370	0.100 *	56.680	3.883	56.490	0.769
6	R. Dry	0.000	56.480	0.820 *	56.790	5.516	56.350	0.000 *	57.030	26.70	56.490	0.920 *
7	R. Dry	0.000	56.495	1.039	56.495	0.980 *	56.345	0.000 *	57.295	35.88	56.490	0.780
8	R. Dry	0.000	56.420	0.491	56.430	0.620	56.335	0.000 *	57.460	54.36	56.490	0.759
9	R. Dry	0.000	56.380	0.130 *	56.403	0.386	56.330	0.000 *	56.870	7.855	56.485	0.767
10	R. Dry	0.000	56.340	0.000 *	57.080	14.08	56.330	0.000 *	56.730	4.286	56.485	0.753
11	R. Dry	0.000	56.325	0.000 *	56.640	2.827	56.340	0.000 *	56.655	2.973	56.480	0.719
12	R. Dry	0.000	56.305	0.000 *	56.480	0.836	56.365	0.080 *	56.620	2.618	56.480	0.715
13	R. Dry	0.000	56.290	0.000 *	56.410	0.398	56.370	0.100 *	56.600	1.662	56.480	0.820 *
14	R. Dry	0.000	56.285	0.000 *	56.390	0.170 *	56.355	0.050 *	56.590	1.790	56.475	0.770 *
15	R. Dry	0.000	56.285	0.000 *	56.355	0.050 *	56.350	0.000 *	56.580	1.727	56.475	0.696
16	R. Dry	0.000	56.285	0.000 *	56.345	0.000 *	57.100	30.87	56.575	1.620	56.475	0.689
17	R. Dry	0.000	56.290	0.000 *	56.330	0.000 *	56.730	5.178	56.570	1.551	56.470	0.637
18	R. Dry	0.000	56.290	0.000 *	56.320	0.000 *	57.225	31.63	56.565	1.495	56.465	0.614
19	R. Dry	0.000	56.290	0.000 *	56.320	0.000 *	61.250	850.9	56.560	1.446	56.465	0.601
20	R. Dry	0.000	56.290	0.000 *	56.315	0.000 *	59.285	321.2	56.555	1.335	56.465	0.680 *
21	R. Dry	0.000	56.285	0.000 *	56.315	0.000 *	58.895	252.9	56.550	1.294	56.460	0.581
22	R. Dry	0.000	56.280	0.000 *	56.310	0.000 *	56.945	10.05	56.545	1.306	56.460	0.572
23	56.410	0.000	56.275	0.000 *	56.310	0.000 *	56.740	5.023	56.540	1.278	56.455	0.550
24	56.300	0.000	56.270	0.000 *	56.310	0.000 *	56.640	3.112	56.535	1.217	56.450	0.531
25	56.260	0.000	56.265	0.000 *	56.315	0.000 *	56.600	2.470 *	56.530	1.160	56.450	0.523
26	56.260	0.000	56.315	0.000 *	56.340	0.000 *	56.570	1.844	56.525	1.055	56.445	0.428
27	56.230	0.000	56.440	0.000	56.350	0.000 *	56.550	1.330	56.520	1.008	56.440	0.358
28	56.220	0.000	56.370	0.000 *	56.370	0.100 *	56.540	1.285	56.520	0.987	56.435	0.430 *
29	56.640	3.067	56.730	0.000	56.370	0.100 *	56.530	1.192	56.515	0.943	56.435	0.376
30	56.410	0.412	56.545	0.000	56.520	1.142	56.520	1.166	56.510	1.150 *	56.440	0.403
31			56.440	0.470 *	56.495	1.083			56.505	0.860		
Ten-Daily Mean												
I Ten-Daily	R. Dry	0.000	56.649	10.78	56.517	2.319	56.373	0.215	56.819	13.83	56.492	0.801
II Ten-Daily	R. Dry	0.000	56.294	0.000	56.391	0.428	57.337	124.0	56.587	1.822	56.473	0.694
III Ten-Daily	56.341	0.435	56.383	0.043	56.364	0.220	56.853	28.04	56.527	1.115	56.447	0.475
Monthly												
Min.	56.220	0.000	56.265	0.000	56.310	0.000	56.330	0.000	56.505	0.860	56.435	0.358
Max.	56.640	3.067	57.360	50.47	57.080	14.08	61.250	850.9	57.460	54.36	56.500	0.920
Mean	56.341	0.435	56.440	3.494	56.422	0.965	56.854	50.75	56.640	5.443	56.471	0.657

Annual Runoff in MCM = 161 Annual Runoff in mm = 41

Peak Observed Discharge = 850.9 cumecs on 19/09/2016 Corres. Water Level :61.25 m

Lowest Observed Discharge = 0.000 cumecs on 23/06/2016 Corres. Water Level :56.41 m

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

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

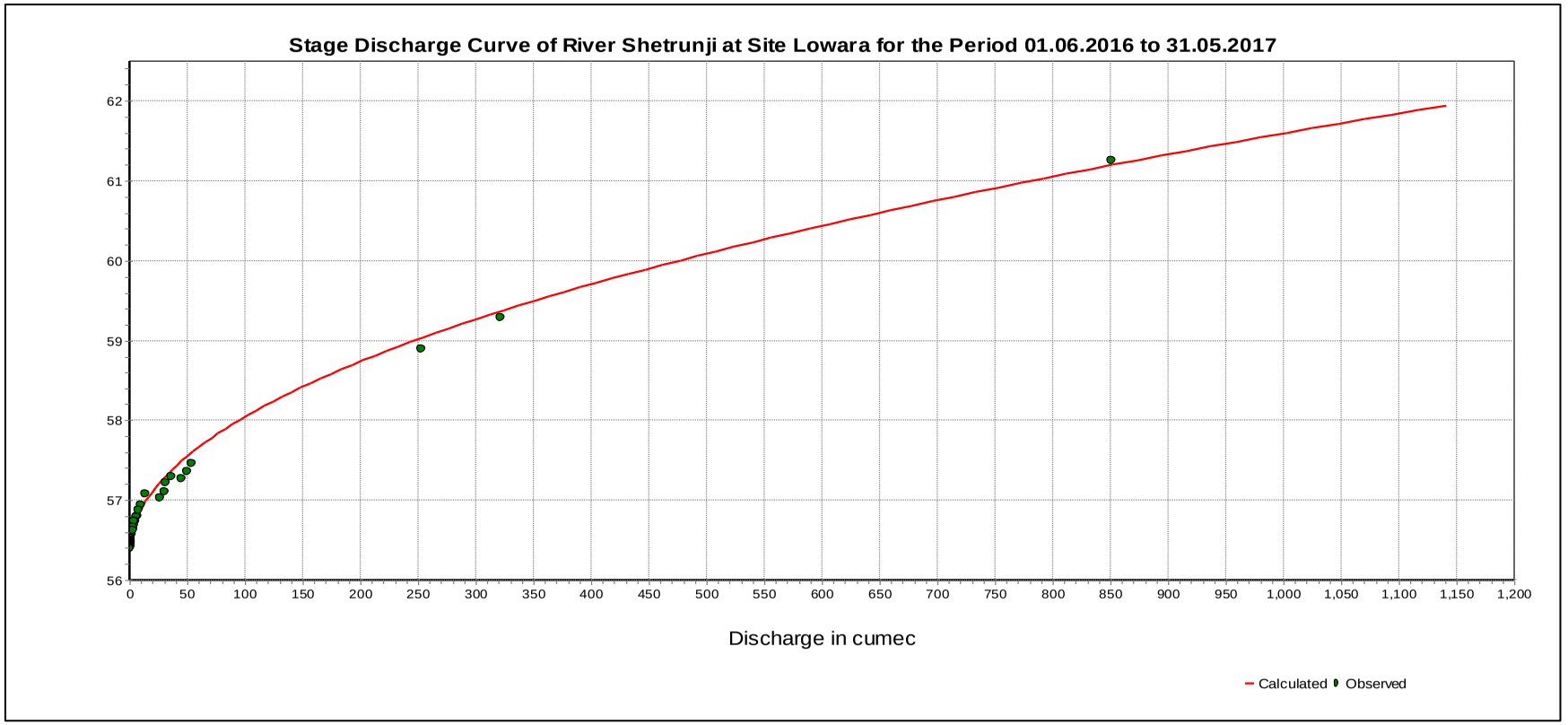
Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	56.435	0.372	56.370	0.000	56.320	0.000	56.315	0.000	56.295	0.000	56.255	0.000
2	56.430	0.382	56.365	0.000	56.320	0.000	56.315	0.000	56.295	0.000	56.255	0.000
3	56.430	0.374	56.365	0.000	56.320	0.000	56.310	0.000	56.295	0.000	56.250	0.000
4	56.430	0.400 *	56.360	0.000	56.320	0.000	56.310	0.000	56.295	0.000	56.250	0.000
5	56.430	0.346	56.355	0.000	56.315	0.000	56.310	0.000	56.295	0.000	56.250	0.000
6	56.425	0.338	56.350	0.000	56.315	0.000	56.310	0.000	56.295	0.000	56.245	0.000
7	56.420	0.342	56.345	0.000	56.315	0.000	56.310	0.000	56.290	0.000	56.245	0.000
8	56.410	0.329	56.345	0.000	56.315	0.000	56.310	0.000	56.290	0.000	56.245	0.000
9	56.410	0.337	56.345	0.000	56.310	0.000	56.305	0.000	56.290	0.000	56.240	0.000
10	56.405	0.306	56.340	0.000	56.310	0.000	56.305	0.000	56.290	0.000	56.240	0.000
11	56.405	0.250 *	56.340	0.000	56.310	0.000	56.345	0.000	56.280	0.000	56.235	0.000
12	56.405	0.250 *	56.340	0.000	56.310	0.000	56.340	0.000	56.280	0.000	56.215	0.000
13	56.405	0.250 *	56.340	0.000	56.310	0.000	56.330	0.000	56.275	0.000	56.205	0.000
14	56.405	0.307	56.340	0.000	56.310	0.000	56.320	0.000	56.275	0.000	56.200	0.000
15	56.400	0.254	56.340	0.000	56.310	0.000	56.315	0.000	56.275	0.000	56.190	0.000
16	56.395	0.247	56.340	0.000	56.310	0.000	56.315	0.000	56.275	0.000	56.180	0.000
17	56.390	0.234	56.340	0.000	56.310	0.000	56.310	0.000	56.275	0.000	56.170	0.000
18	56.385	0.150 *	56.340	0.000	56.310	0.000	56.310	0.000	56.270	0.000	56.160	0.000
19	56.385	0.000	56.335	0.000	56.310	0.000	56.310	0.000	56.270	0.000	56.150	0.000
20	56.380	0.000	56.330	0.000	56.310	0.000	56.310	0.000	56.265	0.000	56.150	0.000
21	56.375	0.000	56.330	0.000	56.320	0.000	56.310	0.000	56.260	0.000	56.150	0.000
22	56.365	0.000	56.330	0.000	56.320	0.000	56.310	0.000	56.260	0.000	56.140	0.000
23	56.360	0.000	56.330	0.000	56.320	0.000	56.310	0.000	56.260	0.000	56.140	0.000
24	56.360	0.000	56.330	0.000	56.315	0.000	56.310	0.000	56.255	0.000	56.130	0.000
25	56.360	0.000	56.330	0.000	56.315	0.000	56.305	0.000	56.255	0.000	56.120	0.000
26	56.360	0.000	56.330	0.000	56.315	0.000	56.305	0.000	56.255	0.000	56.110	0.000
27	56.360	0.000	56.325	0.000	56.315	0.000	56.305	0.000	56.255	0.000	56.100	0.000
28	56.360	0.000	56.325	0.000	56.315	0.000	56.305	0.000	56.255	0.000	56.090	0.000
29	56.375	0.000	56.320	0.000			56.300	0.000	56.255	0.000	56.080	0.000
30	56.375	0.000	56.320	0.000			56.300	0.000	56.255	0.000	56.070	0.000
31	56.370	0.000	56.320	0.000			56.295	0.000			56.060	0.000
Ten-Daily Mean												
I Ten-Daily	56.422	0.353	56.354	0.000	56.316	0.000	56.310	0.000	56.293	0.000	56.247	0.000
II Ten-Daily	56.396	0.194	56.339	0.000	56.310	0.000	56.321	0.000	56.274	0.000	56.185	0.000
III Ten-Daily	56.365	0.000	56.326	0.000	56.317	0.000	56.305	0.000	56.257	0.000	56.108	0.000
Monthly												
Min.	56.360	0.000	56.320	0.000	56.310	0.000	56.295	0.000	56.255	0.000	56.060	0.000
Max.	56.435	0.400	56.370	0.000	56.320	0.000	56.345	0.000	56.295	0.000	56.255	0.000
Mean	56.394	0.176	56.339	0.000	56.314	0.000	56.312	0.000	56.274	0.000	56.178	0.000

Peak Computed Discharge = 2.470 cumecs on 25/09/2016 Corres. Water Level :56.6 m

Lowest Computed Discharge = 0.000 cumecs on 01/07/2016 Corres. Water Level :56.31 m

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

Note:Missing values ignored while arriving at Annual Runoff



Procedure - Standard

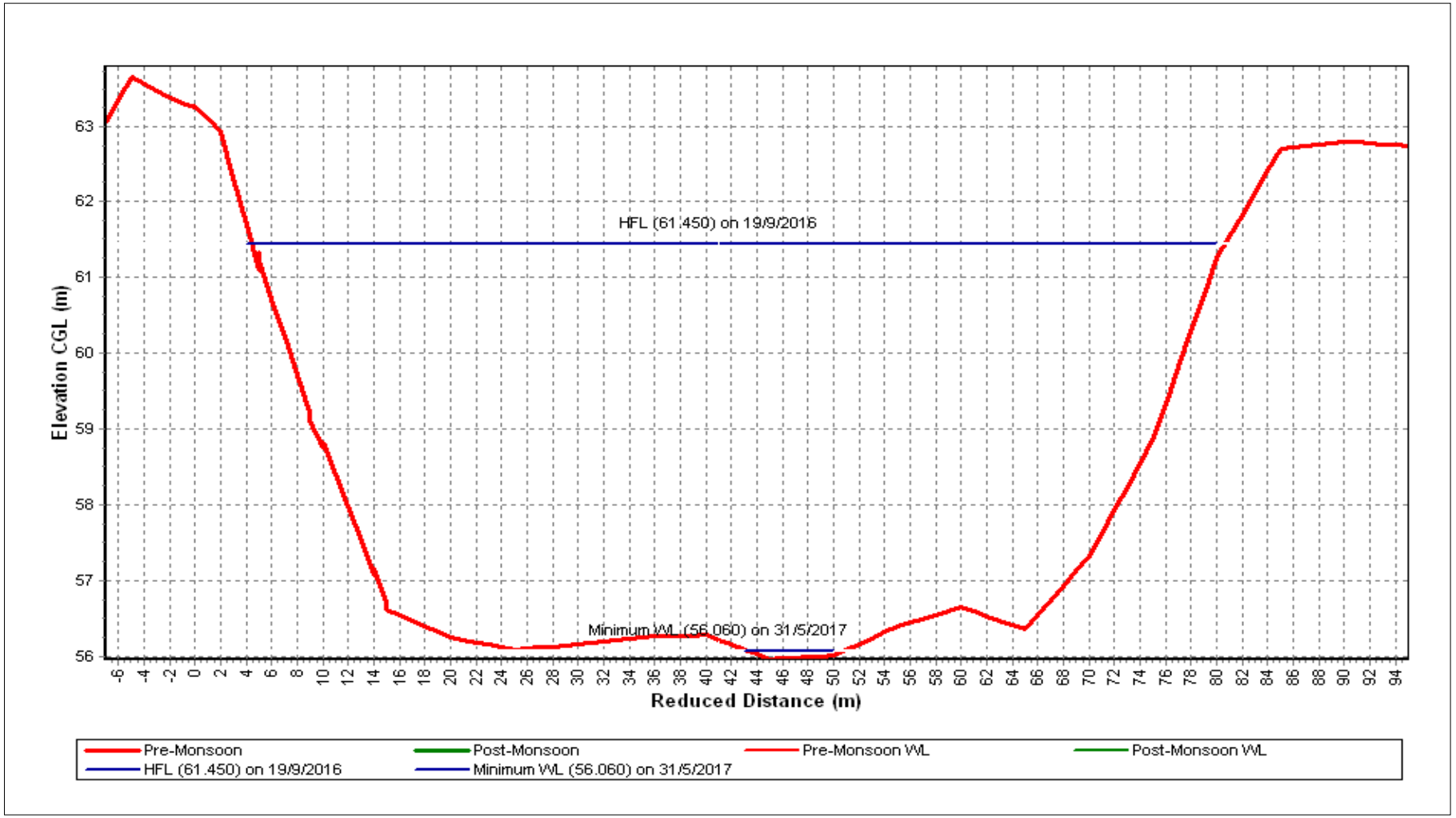
Equation Type - Power $Q=c*(h+a)^b$

LB	UB	a	b	c
56.3	62	-56.31	2.068	31.955

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

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



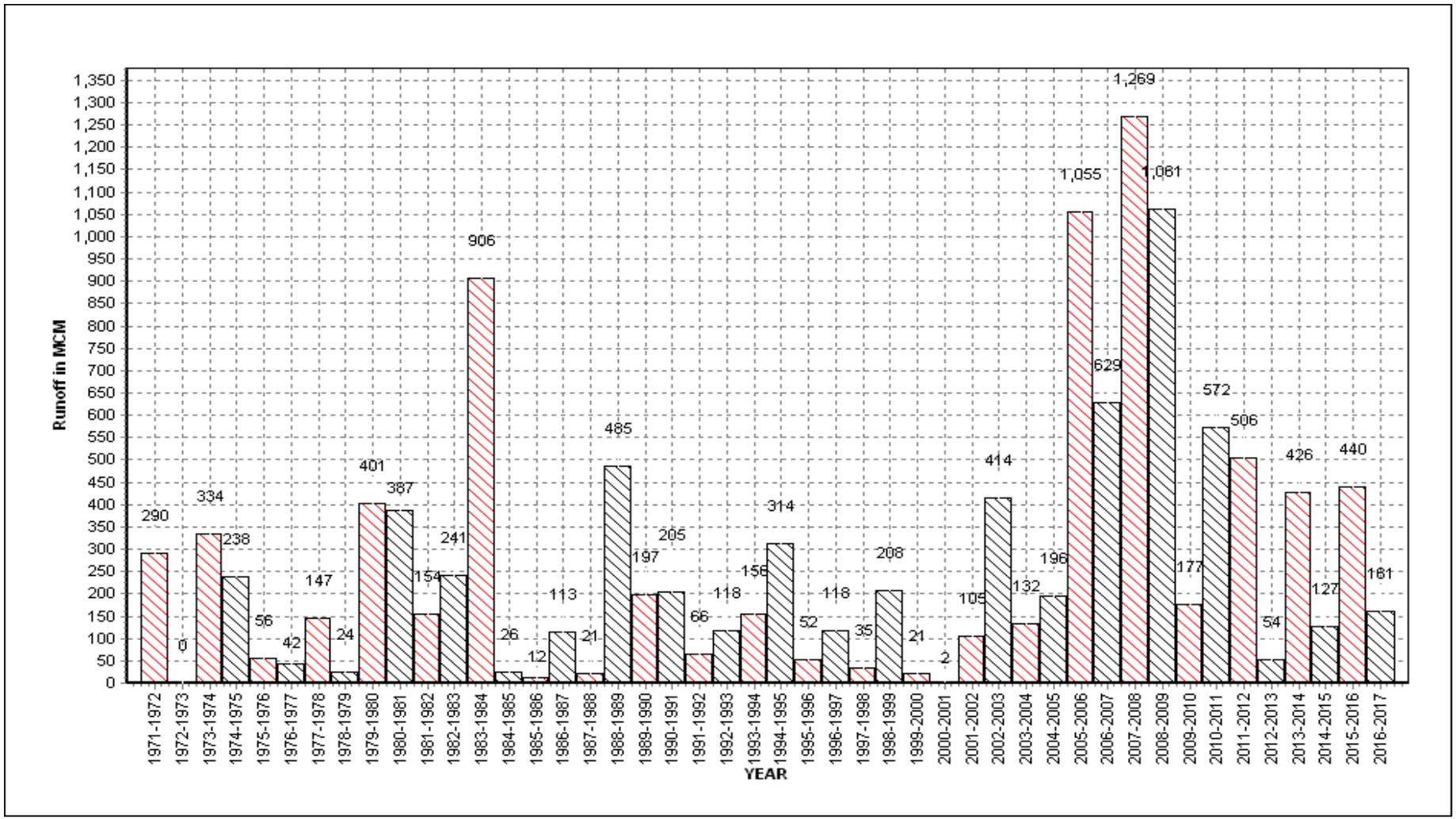
Historic Flood Level-66.93 m on 09.11.1982 at 0800hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1971 - 2017

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

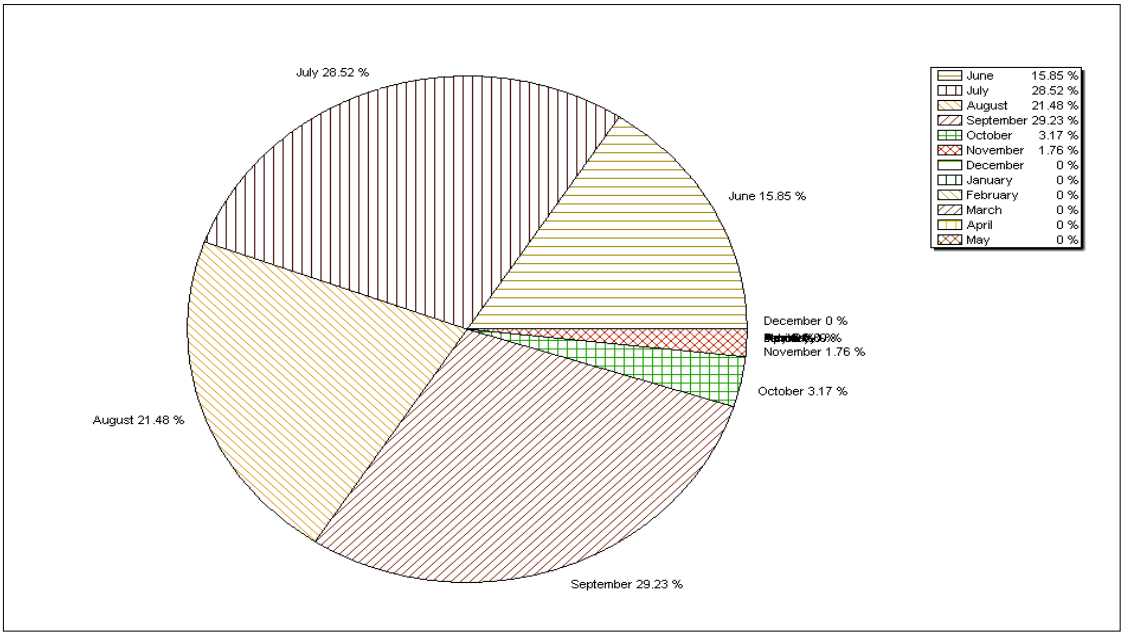


Note: Missing values have not been considered while arriving at Annual Runoff

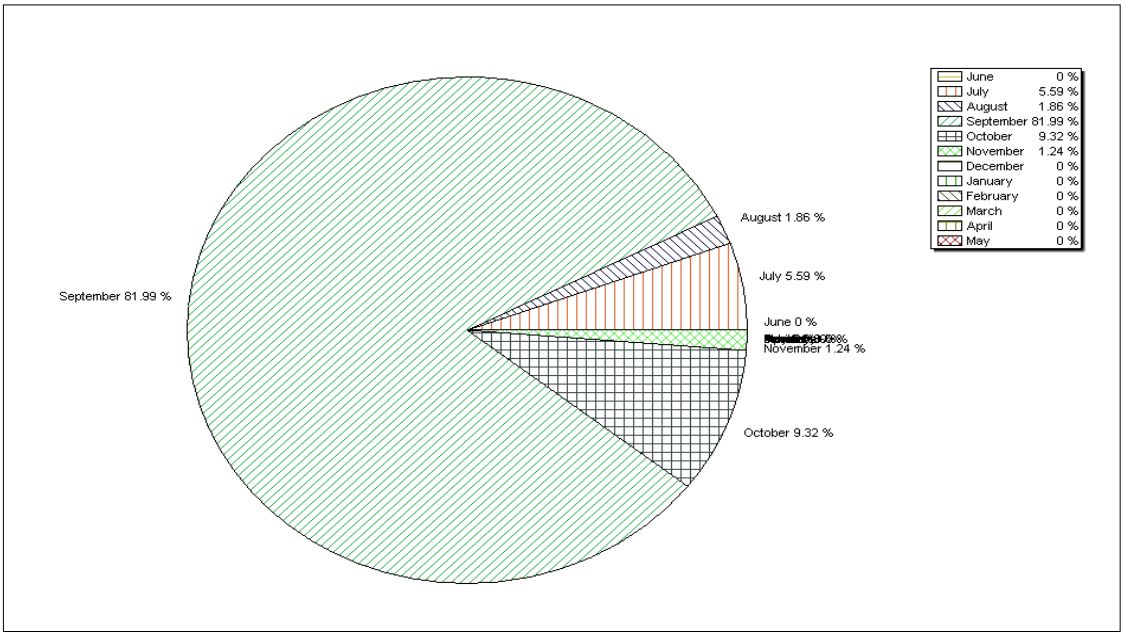
Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 1971-2016



Monthly Runoff for the Year : 2016-2017

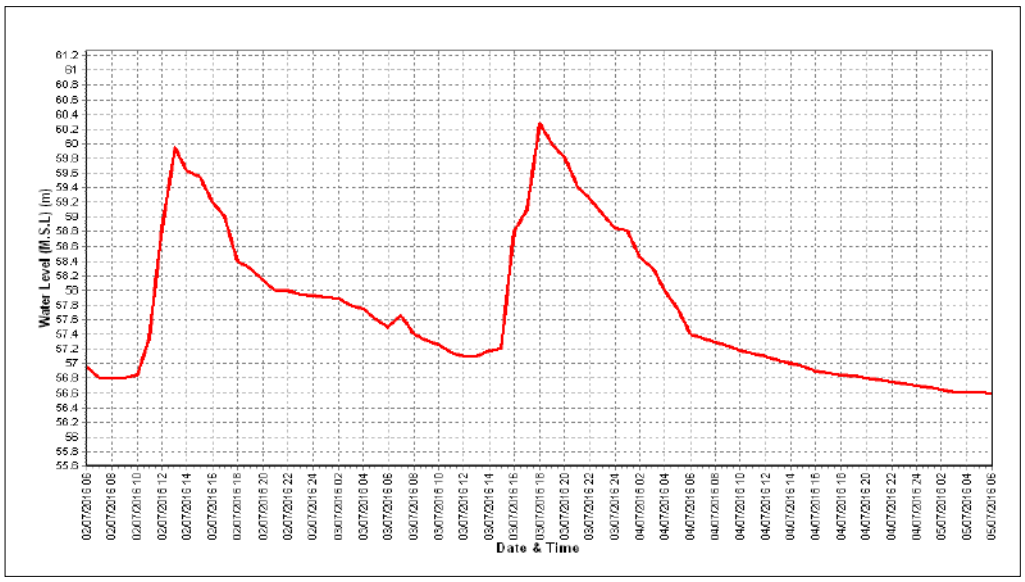


Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

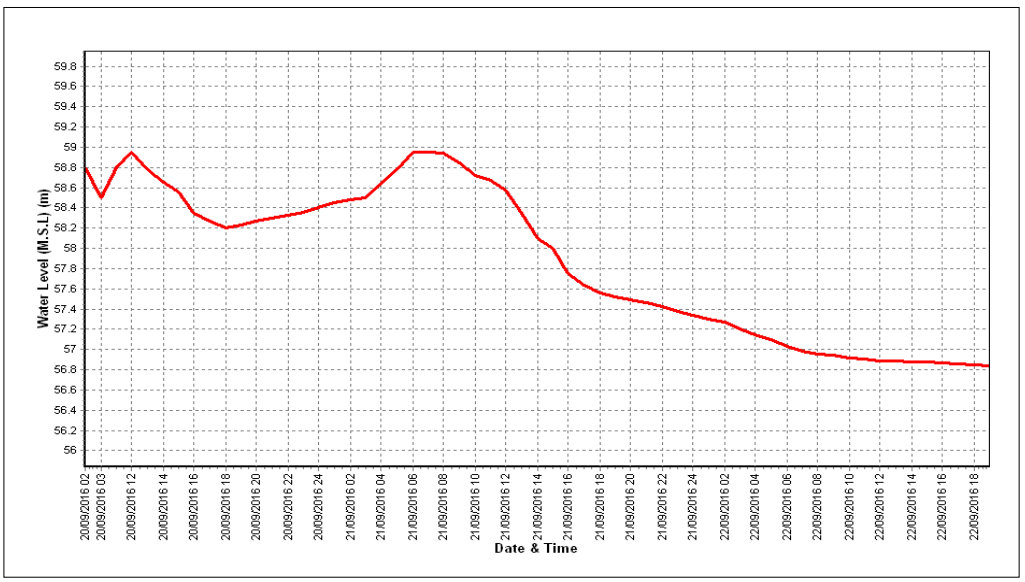
Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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

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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Bhadar at Ganod**	**Code**	:	**01 02 07 001**
State	:	Gujarat	District		Rajkot
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Bhadar
Tributary	:	Bhadar	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Bhadar
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	6266 Sq. Km.	Bank	:	Right
Latitude	:	21°39'53" N	Longitude	:	70°10'52" E
Zero of Gauge (m)	:	26 (m.s.l)	14/11/1970		-
		Opening Date	Closing Date		
Gauge	:	14/11/1970			
Discharge	:	14/11/1970			
Sediment	:	07/07/1973			
Water Quality	:	01/07/1973			

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	841.8	30.430	31/08/1971	0.000	26.820	24/05/1972
1972-1973	1230	31.600	30/06/1972	0.000	River Dry	21/11/1972
1973-1974	362.0	29.030	10/07/1973	0.000	River Dry	25/01/1974
1974-1975	229.3	28.300	30/09/1974	0.000	River Dry	25/01/1975
1975-1976	244.5	28.625	12/07/1975	0.000	River Dry	04/02/1976
1976-1977	1048	31.080	16/07/1976	0.000	River Dry	05/06/1976
1977-1978	526.0	30.400	04/09/1977	0.000	River Dry	06/06/1977
1978-1979	210.5	28.965	30/08/1978	0.000	River Dry	27/04/1979
1979-1980	4098	33.330	11/08/1979	0.000	River Dry	25/07/1979
1980-1981	2977	33.320	04/07/1980	0.000	26.405	19/04/1981
1981-1982	926.2	29.860	11/07/1981	0.000	River Dry	18/06/1981
1982-1983	380.0	29.400	09/11/1982	0.000	River Dry	28/06/1982
1983-1984	2750	34.100	22/06/1983	0.000	River Dry	14/05/1984
1984-1985	2315	32.110	14/09/1984	0.000	River Dry	28/04/1985
1985-1986	47.70	27.060	19/07/1985	0.000	River Dry	25/01/1986
1986-1987	192.3	27.630	08/08/1986	0.000	River Dry	25/01/1987
1987-1988	29.91	26.845	20/11/1987	0.000	River Dry	09/05/1988
1988-1989	4160	33.120	27/07/1988	0.000	River Dry	11/03/1989
1989-1990	751.5	29.125	25/07/1989	0.000	River Dry	05/02/1990
1990-1991	1016	30.190	18/08/1990	0.000	River Dry	25/01/1991
1991-1992	382.0	28.345	28/07/1991	0.000	River Dry	26/01/1992
1992-1993	699.3	31.500	30/07/1992	0.000	River Dry	04/12/1992
1993-1994	174.5	27.680	10/07/1993	0.000	River Dry	21/11/1993
1994-1995	2594	33.030	14/07/1994	0.000	River Dry	07/02/1995
1995-1996	70.52	27.190	31/07/1995	0.000	River Dry	26/01/1996
1996-1997	3526	33.000	20/06/1996	0.000	River Dry	25/01/1997

1997-1998	248.0	28.460	13/09/1997	0.000	River Dry	25/01/1998
1998-1999	75.40	27.410	29/06/1998	0.000	River Dry	14/01/1999
1999-2000	48.20	27.275	14/07/1999	0.000	River Dry	26/01/2000
2000-2001	36.79	26.960	26/08/2000	0.000	River Dry	25/01/2001
2001-2002	654.2	28.995	05/07/2001	0.000	River Dry	29/01/2002
2002-2003	734.0	30.095	29/06/2002	0.000	River Dry	16/06/2002
2003-2004	263.2	27.900	07/08/2003	0.000	River Dry	02/02/2004
2004-2005	75.36	27.007	11/08/2004	0.000	River Dry	30/03/2005
2005-2006	455.7	28.580	12/09/2005	0.000	River Dry	01/06/2005
2006-2007	2728	31.810	30/07/2006	0.000	River Dry	01/06/2006
2007-2008	3474	33.295	08/08/2007	0.000	River Dry	01/06/2007
2008-2009	1902	32.160	16/09/2008	0.000	River Dry	01/06/2008
2009-2010	1102	29.600	24/07/2009	0.000	River Dry	01/06/2009
2010-2011	1932	30.850	01/09/2010	0.000	River Dry	01/06/2010
2011-2012	97.6	26.010	13/09/2011	0.000	River Dry	22/06/2011
2012-2013	River Dry					
2013-2014	1477	30.05	27/09/2013	0.000	River Dry	01/06/2013
2014-2015	River Dry					
2015-2016	2030	29.95	25/06/2015	0.000	River Dry	01/06/2015
2016-2017	2164	29.8	05/08/2016	0.000	27.33	07/08/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.370	0.000	27.255	0.000
2	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.335	0.000	27.245	0.000
3	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.325	0.000	27.235	0.000
4	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	27.440	0.000	27.325	0.000	27.225	0.000
5	R.Dry	0.000	R.Dry	0.000	29.800	2164	27.400	0.000	27.840	155.2	27.215	0.000
6	R.Dry	0.000	R.Dry	0.000	27.830	331.0	27.400	0.000	27.420	0.000	27.190	0.000
7	R.Dry	0.000	R.Dry	0.000	27.330	0.000	27.395	0.000	27.610	136.3	27.170	0.000
8	R.Dry	0.000	R.Dry	0.000	27.395	0.000	27.390	0.000	27.420	0.000	27.160	0.000
9	R.Dry	0.000	R.Dry	0.000	27.390	0.000	27.380	0.000	27.470	0.000	27.145	0.000
10	R.Dry	0.000	R.Dry	0.000	27.395	0.000	27.360	0.000	27.420	0.000	27.125	0.000
11	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.325	0.000	27.410	0.000	27.100	0.000
12	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.255	0.000	27.410	0.000	27.080	0.000
13	R.Dry	0.000	R.Dry	0.000	27.375	0.000	27.200	0.000	27.425	0.000	27.060	0.000
14	R.Dry	0.000	R.Dry	0.000	27.375	0.000	27.145	0.000	27.420	0.000	27.040	0.000
15	R.Dry	0.000	R.Dry	0.000	27.365	0.000	27.100	0.000	27.410	0.000	27.015	0.000
16	R.Dry	0.000	R.Dry	0.000	27.355	0.000	27.100	0.000	27.410	0.000	26.990	0.000
17	R.Dry	0.000	R.Dry	0.000	27.335	0.000	27.085	0.000	27.400	0.000	26.965	0.000
18	R.Dry	0.000	R.Dry	0.000	27.320	0.000	27.075	0.000	27.430	0.000	26.945	0.000
19	R.Dry	0.000	R.Dry	0.000	27.300	0.000	27.720	300.8	27.425	0.000	26.930	0.000
20	R.Dry	0.000	R.Dry	0.000	27.255	0.000	27.400	0.000	27.400	0.000	26.910	0.000
21	R.Dry	0.000	R.Dry	0.000	27.235	0.000	27.590	133.8	27.390	0.000	26.885	0.000
22	R.Dry	0.000	R.Dry	0.000	27.205	0.000	27.420	0.000	27.385	0.000	26.865	0.000
23	R.Dry	0.000	R.Dry	0.000	27.165	0.000	27.420	0.000	27.365	0.000	26.840	0.000
24	R.Dry	0.000	R.Dry	0.000	27.095	0.000	27.415	0.000	27.355	0.000	26.820	0.000
25	R.Dry	0.000	R.Dry	0.000	27.060	0.000	27.400	0.000	27.340	0.000	26.800	0.000
26	R.Dry	0.000	R.Dry	0.000	27.050	0.000	27.395	0.000	27.320	0.000	26.780	0.000
27	R.Dry	0.000	R.Dry	0.000	27.040	0.000	27.390	0.000	27.320	0.000	26.760	0.000
28	R.Dry	0.000	R.Dry	0.000	27.180	0.000	27.390	0.000	27.310	0.000	26.740	0.000
29	R.Dry	0.000	R.Dry	0.000	27.160	0.000	27.385	0.000	27.295	0.000	26.720	0.000
30	R.Dry	0.000	R.Dry	0.000	27.380	0.000	27.385	0.000	27.265	0.000	26.700	0.000
31	R.Dry	0.000	R.Dry	0.000	27.380	0.000			27.260	0.000		
Ten-Daily Mean												
I Ten-Daily	R.Dry	0.000	R.Dry	0.000	27.857	415.9	27.390	0.000	27.454	29.15	27.197	0.000
II Ten-Daily	R.Dry	0.000	R.Dry	0.000	27.344	0.000	27.241	30.08	27.414	0.000	27.003	0.000
III Ten-Daily	R.Dry	0.000	R.Dry	0.000	27.177	0.000	27.419	13.38	27.328	0.000	26.791	0.000
Monthly												
Min.	R.Dry	0.000	R.Dry	0.000	27.040	0.000	27.075	0.000	27.260	0.000	26.700	0.000
Max.	R.Dry	0.000	R.Dry	0.000	29.800	2164	27.720	300.8	27.840	155.2	27.255	0.000
Mean	R.Dry	0.000	R.Dry	0.000	27.390	92.42	27.350	14.49	27.396	9.403	26.997	0

Annual Runoff in MCM = 278 Annual Runoff in mm = 44

Peak Observed Discharge = 2164 cumecs on 05/08/2016 Corres. Water Level :29.8 m

Lowest Observed Discharge = 0.000 cumecs on 07/08/2016 Corres. Water Level :27.33 m

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

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

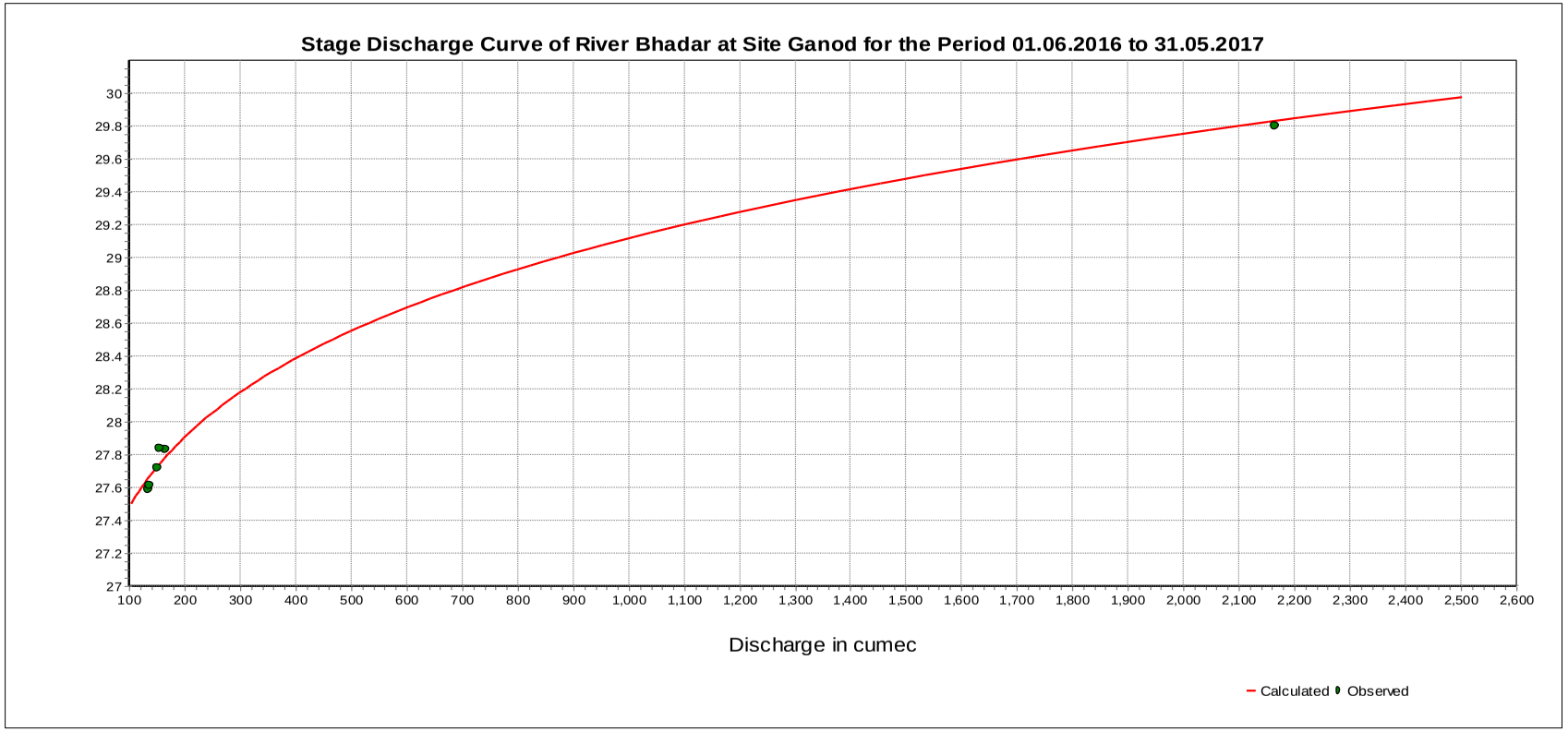
Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	26.680	0.000	26.050	0.000	25.400	0.000	27.060	0.000	26.480	0.000	25.830	0.000
2	26.660	0.000	26.030	0.000	25.360	0.000	27.040	0.000	26.460	0.000	25.810	0.000
3	26.640	0.000	26.010	0.000	25.340	0.000	27.020	0.000	26.440	0.000	25.780	0.000
4	26.620	0.000	25.990	0.000	25.320	0.000	27.000	0.000	26.420	0.000	25.750	0.000
5	26.600	0.000	25.950	0.000	25.300	0.000	26.980	0.000	26.380	0.000	25.720	0.000
6	26.580	0.000	25.920	0.000	25.270	0.000	26.970	0.000	26.360	0.000	25.700	0.000
7	26.560	0.000	25.900	0.000	25.250	0.000	26.950	0.000	26.340	0.000	25.680	0.000
8	26.520	0.000	25.880	0.000	25.230	0.000	26.940	0.000	26.330	0.000	25.650	0.000
9	26.510	0.000	25.860	0.000	25.210	0.000	26.920	0.000	26.310	0.000	25.630	0.000
10	26.510	0.000	25.840	0.000	25.190	0.000	26.900	0.000	26.300	0.000	25.610	0.000
11	26.500	0.000	25.820	0.000	25.180	0.000	26.880	0.000	26.280	0.000	25.570	0.000
12	26.490	0.000	25.800	0.000	25.170	0.000	26.860	0.000	26.240	0.000	25.530	0.000
13	26.470	0.000	25.780	0.000	25.150	0.000	26.840	0.000	26.210	0.000	25.500	0.000
14	26.450	0.000	25.760	0.000	25.120	0.000	26.830	0.000	26.180	0.000	25.460	0.000
15	26.430	0.000	25.740	0.000	25.100	0.000	26.800	0.000	26.150	0.000	25.420	0.000
16	26.420	0.000	25.720	0.000	25.080	0.000	26.780	0.000	26.130	0.000	25.380	0.000
17	26.400	0.000	25.700	0.000	25.060	0.000	26.760	0.000	26.110	0.000	25.340	0.000
18	26.390	0.000	25.680	0.000	25.040	0.000	26.740	0.000	26.090	0.000	25.300	0.000
19	26.370	0.000	25.660	0.000	25.020	0.000	26.720	0.000	26.060	0.000	25.260	0.000
20	26.350	0.000	25.640	0.000	25.000	0.000	26.710	0.000	26.030	0.000	25.220	0.000
21	26.310	0.000	25.620	0.000	24.980	0.000	26.690	0.000	26.010	0.000	25.180	0.000
22	26.290	0.000	25.600	0.000	27.425	0.000	26.670	0.000	26.000	0.000	25.140	0.000
23	26.270	0.000	25.580	0.000	27.100	0.000	26.660	0.000	26.000	0.000	25.100	0.000
24	26.250	0.000	25.560	0.000	27.070	0.000	26.640	0.000	25.990	0.000	25.060	0.000
25	26.230	0.000	25.540	0.000	27.040	0.000	26.620	0.000	25.970	0.000	25.010	0.000
26	26.210	0.000	25.520	0.000	27.240	0.000	26.610	0.000	25.950	0.000	24.950	0.000
27	26.200	0.000	25.500	0.000	27.100	0.000	26.590	0.000	25.910	0.000	24.870	0.000
28	26.180	0.000	25.480	0.000	27.080	0.000	26.570	0.000	25.880	0.000	24.780	0.000
29	26.100	0.000	25.460	0.000			26.550	0.000	25.860	0.000	24.660	0.000
30	26.080	0.000	25.440	0.000			26.530	0.000	25.840	0.000	24.580	0.000
31	26.070	0.000	25.430	0.000			26.510	0.000			24.520	0.000
Ten-Daily Mean												
I Ten-Daily	26.588	0.000	25.943	0.000	25.287	0.000	26.978	0.000	26.382	0.000	25.716	0.000
II Ten-Daily	26.427	0.000	25.730	0.000	25.092	0.000	26.792	0.000	26.148	0.000	25.398	0.000
III Ten-Daily	26.199	0.000	25.521	0.000	26.879	0.000	26.604	0.000	25.941	0.000	24.895	0.000
Monthly												
Min.	26.070	0.000	25.430	0.000	24.980	0.000	26.510	0.000	25.840	0.000	24.520	0.000
Max.	26.680	0.000	26.050	0.000	27.425	0.000	27.060	0.000	26.480	0.000	25.830	0.000
Mean	26.398	0	25.725	0	25.672	0	26.785	0	26.157	0	25.322	0

Peak Computed Discharge = 0.000 cumecs on 01/11/2016 Corres. Water Level :27.255 m

Lowest Computed Discharge = 0.000 cumecs on 01/11/2016 Corres. Water Level :27.255 m

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

Note:Missing values ignored while arriving at Annual Runoff



Procedure : Standard

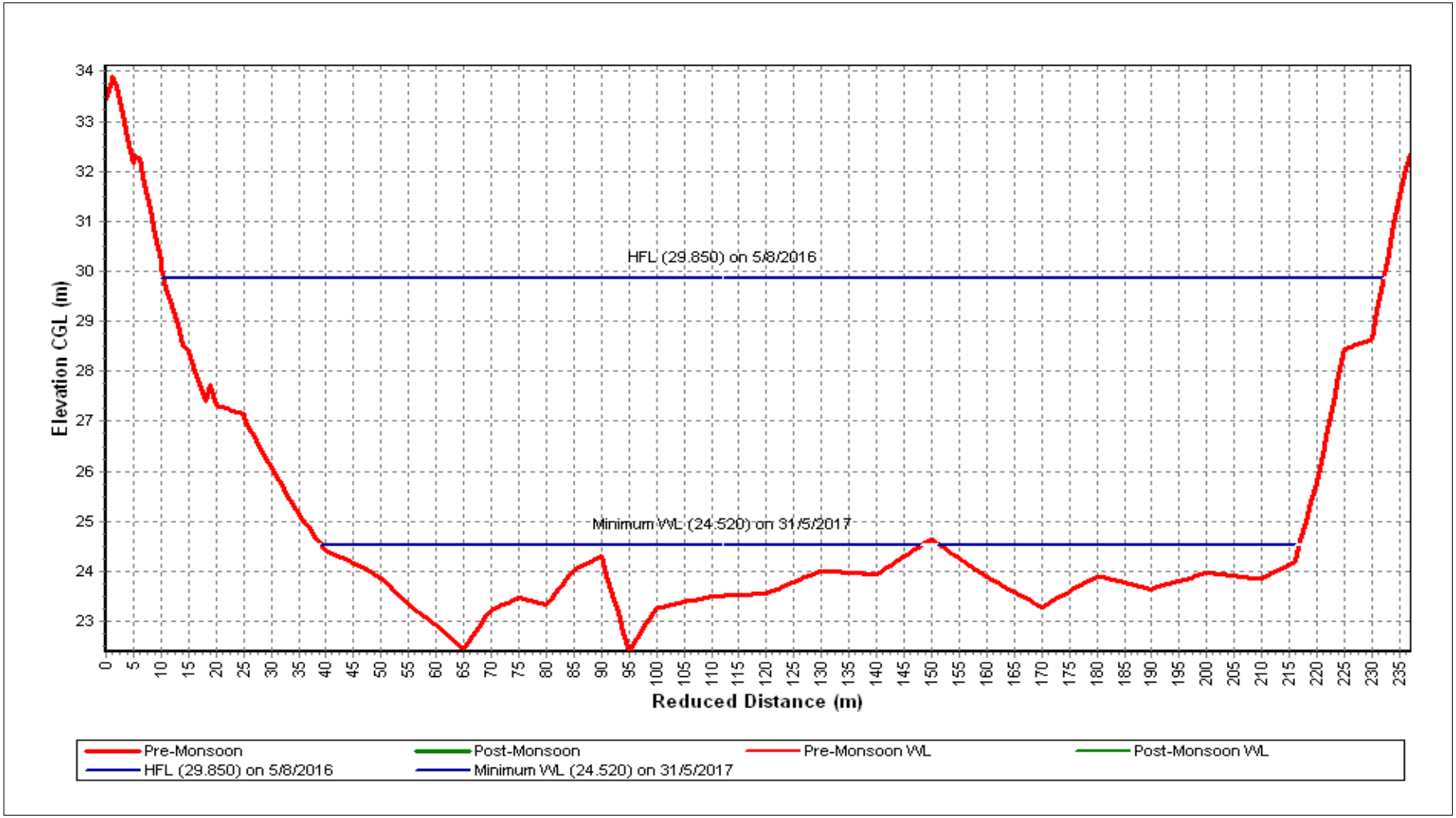
Equation type: Power $Q=(a+h)^{b}*c$

LB	UB	a	b	c
27.5	30	-24.197	5.695	0.115

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

Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



Historic Flood Level-34.100m on 22.06.1983 at 0800 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

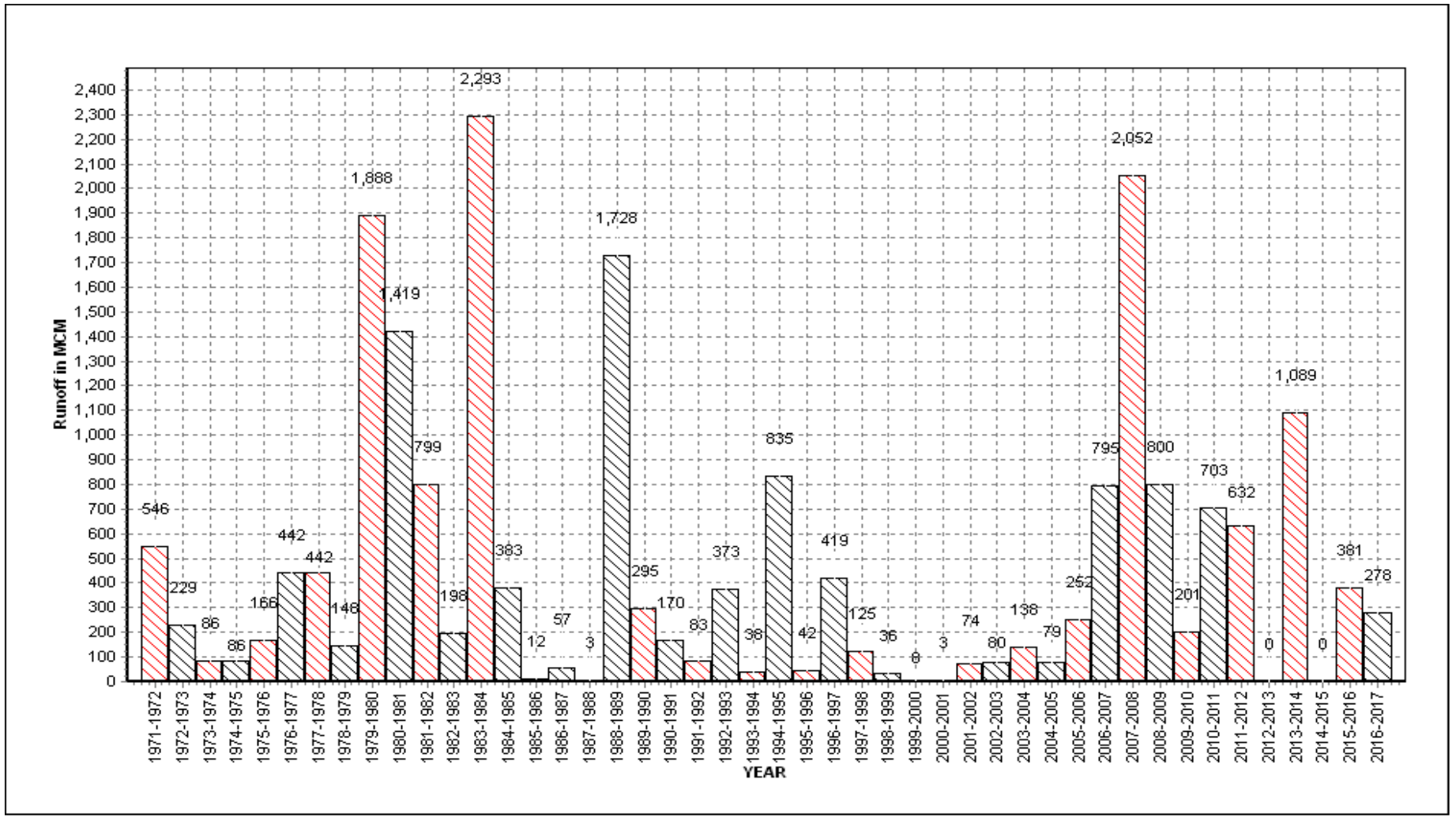
Annual Runoff Values for the period: 1971 - 2017

Station Name : Bhadar at Ganod (01 02 07 001)

Local River : Bhadar

Division : Mahi Division, Gandhinagar

Sub-Division : Sabarmati Sub Divn., Ahmedabad

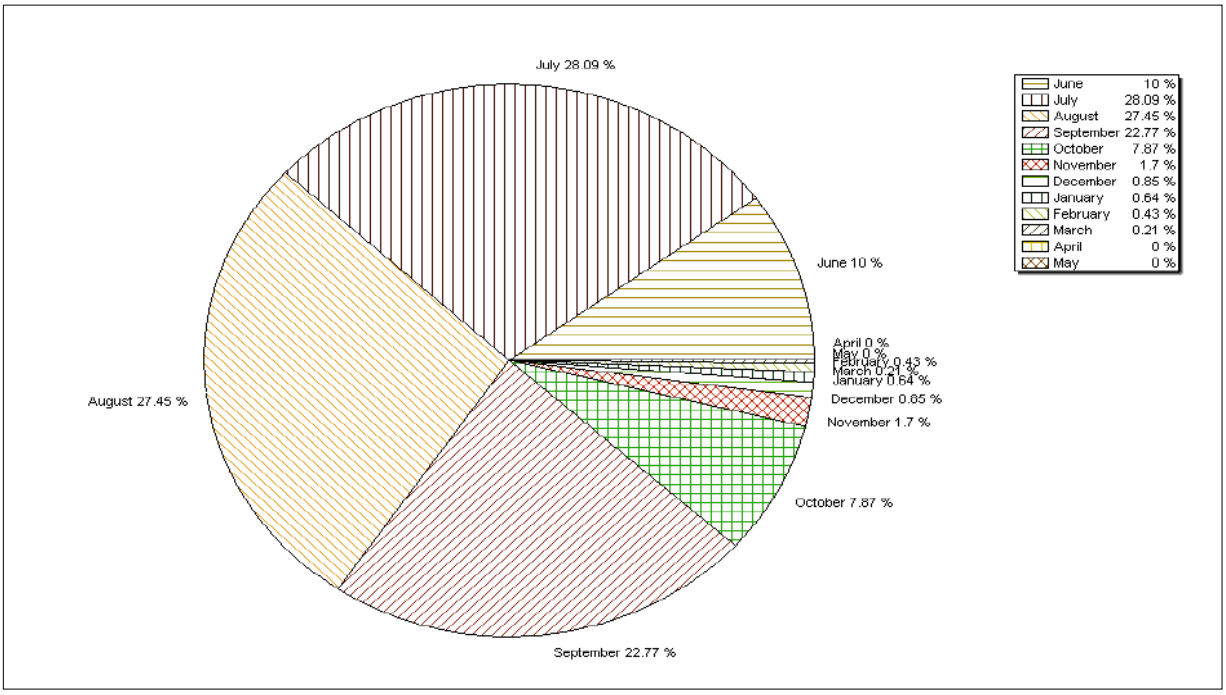


Note: Missing values have not been considered while arriving at Annual Runoff

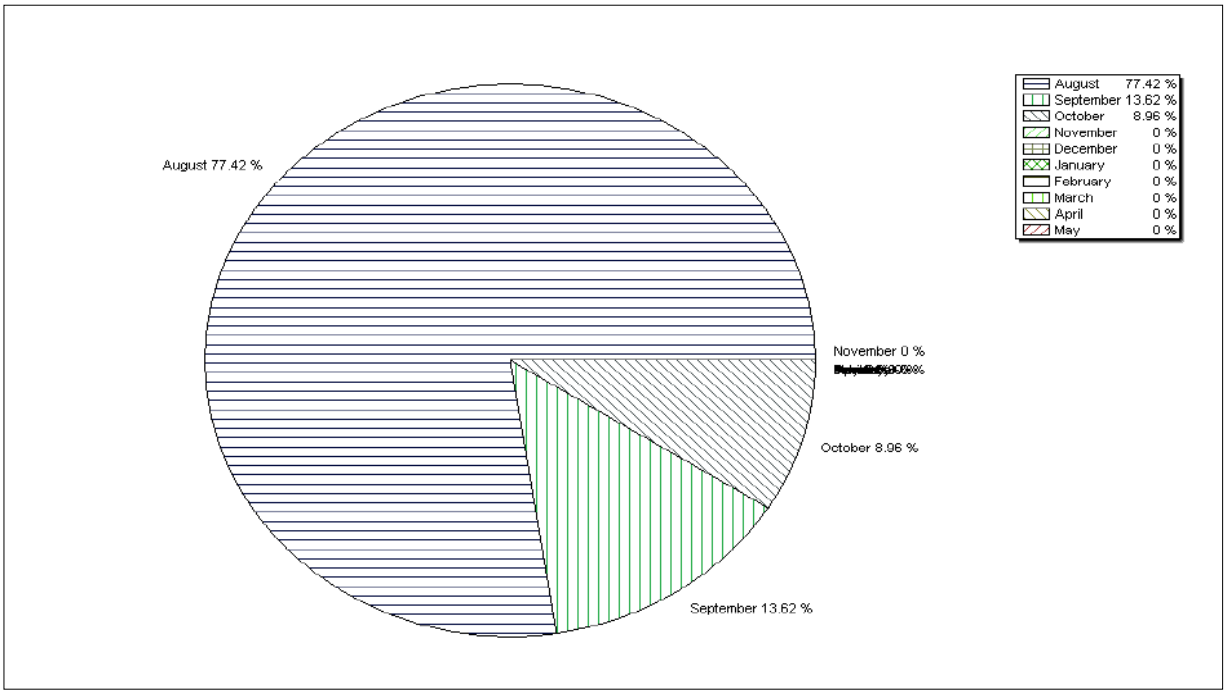
Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 1971-2016



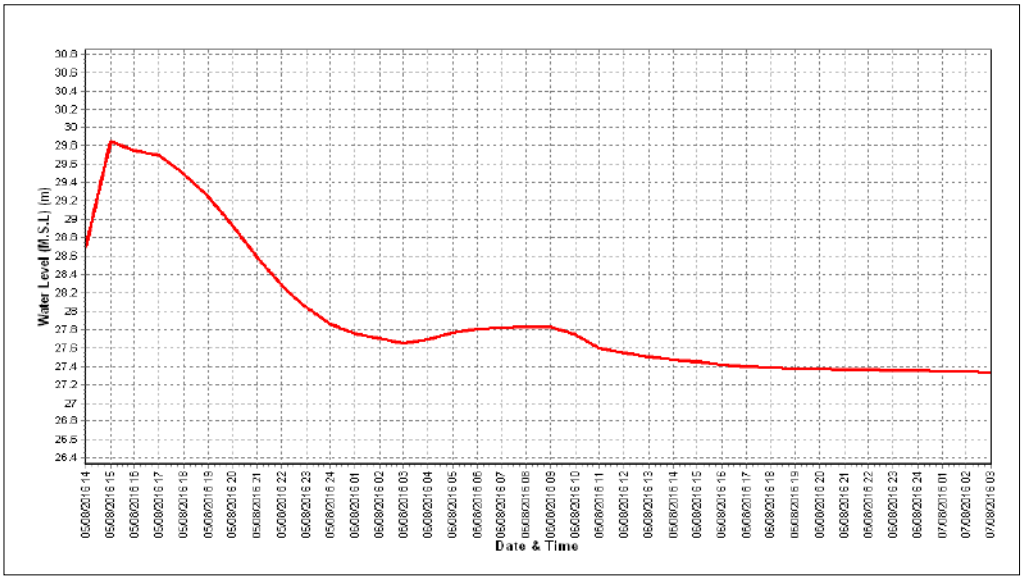
Monthly Runoff for the Year : 2016-2017



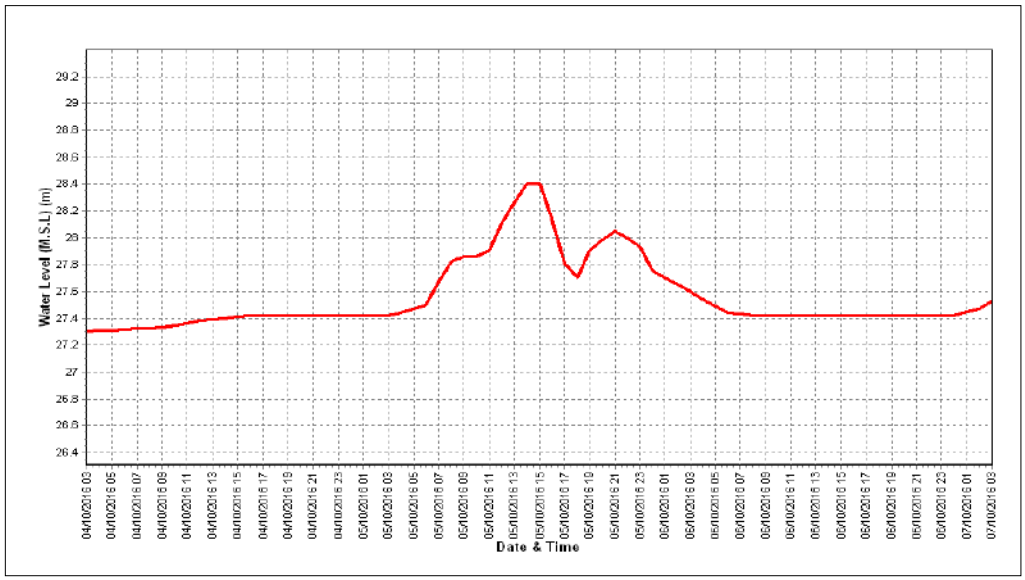
Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

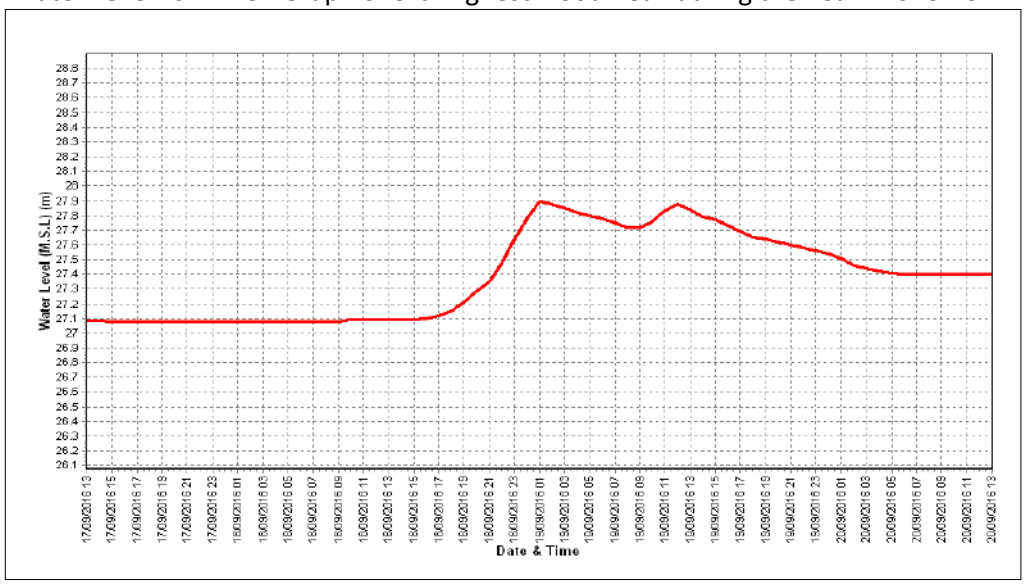
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	**:**	**Machhu at Gungan**	**Code**	**:**	**01 02 03 001**
State	:	Gujarat	District		Rajkot
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Machhu
Tributary	:	Machhu	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Machhu
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	Sabarmati Sub Divn., Ahmedabad
Drainage Area	:	2137 Sq. Km.	Bank	:	Right
Latitude	:	22°57'42" N	Longitude	:	70°45'52" E
Zero of Gauge (m)	:	8 (m.s.l)	13/09/1970	-	
		Opening Date	Closing Date		

Gauge	:	13/09/1970
Discharge	:	09/12/1970
Sediment	:	--
Water Quality	:	--

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
1971-1972	956.3	11.590	17/07/1971	0.000	River Dry	31/12/1971
1972-1973	47.02	9.585	08/07/1972	0.000	River Dry	25/01/1973
1973-1974	River Dry					
1974-1975	River Dry					
1975-1976	279.4	10.645	15/07/1975	0.000	8.425	17/12/1975
1976-1977	1805	14.075	30/08/1976	0.000	River Dry	03/06/1976
1977-1978	726.0	13.120	27/07/1977	0.000	9.335	19/05/1978
1978-1979	95.70	10.670	31/08/1978	0.000	9.485	13/06/1978
1979-1980	79.00	10.375	28/06/1979	0.000	River Dry	25/08/1979
1980-1981	1645	15.700	28/06/1980	0.000	River Dry	04/05/1981
1981-1982	628.1	12.180	11/08/1981	0.000	9.570	05/04/1982
1982-1983	750.8	12.410	24/07/1982	0.000	9.660	20/12/1982
1983-1984	1498	13.850	08/08/1983	0.000	River Dry	17/12/1983
1984-1985	475.3	11.645	14/09/1984	0.000	River Dry	17/12/1984
1985-1986	160.7	10.965	17/07/1985	0.000	River Dry	21/11/1985
1986-1987	407.7	11.760	09/08/1986	0.000	River Dry	07/01/1987
1987-1988	80.98	10.530	16/07/1987	0.000	River Dry	07/02/1988
1988-1989	2681	15.973	28/07/1988	0.000	River Dry	08/11/1988

1989-1990	1781	13.850	25/07/1989	0.000	River Dry	25/11/1989
1990-1991	195.4	10.765	25/08/1990	0.000	River Dry	01/08/1990
1991-1992	9.854	10.070	20/07/1991	0.000	River Dry	26/01/1992
1992-1993	131.6	10.950	31/07/1992	0.000	8.925	30/01/1993
1993-1994	5.395	10.250	10/07/1993	0.000	River Dry	25/01/1994
1994-1995	1657	13.880	15/07/1994	0.000	9.520	06/04/1995
1995-1996	96.96	10.790	26/07/1995	0.000	9.130	26/01/1996
1996-1997	179.0	11.180	21/06/1996	0.000	River Dry	25/01/1997
1997-1998	990.0	16.000	24/06/1997	0.000	9.590	10/11/1997
1998-1999	50.09	11.125	17/10/1998	0.000	9.160	17/12/1998
1999-2000	3.300	9.980	13/10/1999	0.000	8.710	26/01/2000
2000-2001	50.00	11.005	15/07/2000	0.000	8.260	25/01/2001
2001-2002	20.16	10.290	11/07/2001	0.000	River Dry	27/01/2002
2002-2003	70.80	10.625	28/06/2002	0.000	River Dry	22/05/2003
2003-2004	70.16	11.135	24/07/2003	0.000	8.575	23/12/2003
2004-2005	76.00	11.765	11/08/2004	0.000	8.545	25/01/2005
2005-2006	394.0	12.910	20/09/2005	0.000	River Dry	01/06/2005
2006-2007	531.2	12.810	31/07/2006	0.000	River Dry	01/06/2006
2007-2008	1524	12.875	09/08/2007	0.000	9.350	01/06/2008
2008-2009	1689	14.975	18/09/2008	0.000	9.800	02/09/2008
2009-2010	13.48	10.520	31/08/2009	0.000	9.275	01/12/2009
2010-2011	1699	14.720	30/08/2010	0.000	9.190	01/10/2010
2011-2012	58.8	11.750	13/08/2011	0.000	9.560	30/05/2012
2012-2013	0.00	10.030	08/09/2012	0.000	9.305	31/05/2013
2013-2014	289.6	12.175	28/09/2013	0.000	River Dry	01/03/2014
2014-2015	4.712	10.31	03/09/2014	0.000	9.76	01/06/2014
2015-2016	3.556	10.22	01/08/2015	0.000	9.92	22/08/2015
2016-2017	No Observed Discharge			0.000	9.290	21/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

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	9.330	0.000	9.290	0.000	9.490	0.000	9.730	0.000	9.660	0.000	9.770	0.000
2	9.330	0.000	9.290	0.000	9.490	0.000	9.730	0.000	9.650	0.000	9.770	0.000
3	9.330	0.000	9.290	0.000	9.490	0.000	9.730	0.000	9.950	0.000	9.760	0.000
4	9.330	0.000	9.290	0.000	9.490	0.000	10.630	19.66 *	9.950	0.000	9.760	0.000
5	9.320	0.000	9.290	0.000	9.560	0.000	10.500	10.95 *	9.950	0.000	9.760	0.000
6	9.320	0.000	9.290	0.000	9.600	0.000	10.150	1.240 *	9.960	0.000	9.760	0.000
7	9.320	0.000	9.290	0.000	9.650	0.000	9.990	0.260 *	9.960	0.000	9.750	0.000
8	9.320	0.000	9.290	0.000	9.650	0.000	9.970	0.200 *	9.960	0.000	9.750	0.000
9	9.320	0.000	9.290	0.000	9.690	0.000	9.950	0.150 *	9.970	0.000	9.750	0.000
10	9.310	0.000	9.290	0.000	9.700	0.000	9.950	0.150 *	9.980	0.000	3.740	0.000
11	9.310	0.000	9.290	0.000	9.700	0.000	9.940	0.130 *	9.980	0.000	3.740	0.000
12	9.310	0.000	9.290	0.000	9.700	0.000	9.940	0.000	9.980	0.000	3.740	0.000
13	9.310	0.000	9.410	0.000	9.700	0.000	9.920	0.000	9.970	0.000	3.740	0.000
14	9.310	0.000	9.410	0.000	9.700	0.000	9.900	0.000	9.910	0.000	3.740	0.000
15	9.300	0.000	9.490	0.000	9.700	0.000	9.890	0.000	9.860	0.000	9.730	0.000
16	9.300	0.000	9.490	0.000	9.700	0.000	9.870	0.000	9.850	0.000	9.730	0.000
17	9.300	0.000	9.490	0.000	9.700	0.000	9.860	0.000	9.840	0.000	9.730	0.000
18	9.300	0.000	9.490	0.000	9.700	0.000	9.840	0.000	9.830	0.000	9.730	0.000
19	9.300	0.000	9.490	0.000	9.700	0.000	9.820	0.000	9.820	0.000	9.730	0.000
20	9.300	0.000	9.490	0.000	9.690	0.000	9.810	0.000	9.810	0.000	9.730	0.000
21	9.290	0.000	9.490	0.000	9.690	0.000	9.800	0.000	9.810	0.000	9.720	0.000
22	9.290	0.000	9.490	0.000	9.690	0.000	9.780	0.000	9.800	0.000	9.720	0.000
23	9.290	0.000	9.490	0.000	9.680	0.000	9.770	0.000	9.800	0.000	9.720	0.000
24	9.290	0.000	9.490	0.000	9.680	0.000	9.750	0.000	9.800	0.000	9.720	0.000
25	9.290	0.000	9.490	0.000	9.680	0.000	9.740	0.000	9.790	0.000	9.720	0.000
26	9.290	0.000	9.490	0.000	9.680	0.000	9.720	0.000	9.790	0.000	9.720	0.000
27	9.290	0.000	9.490	0.000	9.680	0.000	9.710	0.000	9.780	0.000	9.720	0.000
28	9.290	0.000	9.490	0.000	9.730	0.000	9.690	0.000	9.780	0.000	9.710	0.000
29	9.290	0.000	9.490	0.000	9.730	0.000	9.670	0.000	9.770	0.000	9.710	0.000
30	9.290	0.000	9.490	0.000	9.730	0.000	9.670	0.000	9.770	0.000	9.710	0.000
31			9.490	0.000	9.730	0.000			9.770	0.000		
Ten-Daily Mean												
I Ten-Daily	9.323	0.000	9.290	0.000	9.581	0.000	10.033	4.659	9.899	0.000	9.157	0.000
II Ten-Daily	9.304	0.000	9.434	0.000	9.699	0.000	9.879	0.130	9.885	0.000	7.334	0.000
III Ten-Daily	9.290	0.000	9.490	0.000	9.700	0.000	9.730	0.000	9.787	0.000	9.717	0.000
Monthly												
Min.	9.290	0.000	9.290	0.000	9.490	0.000	9.670	0.130	9.650	0.000	3.740	0.000
Max.	9.330	0.000	9.490	0.000	9.730	0.000	10.630	19.66	9.980	0.000	9.770	0.000
Mean	9.306	0.000	9.407	0.000	9.661	0.000	9.881	4.093	9.855	0.000	8.736	0.000

Annual Runoff in MCM = 3 Annual Runoff in mm = 1

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

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

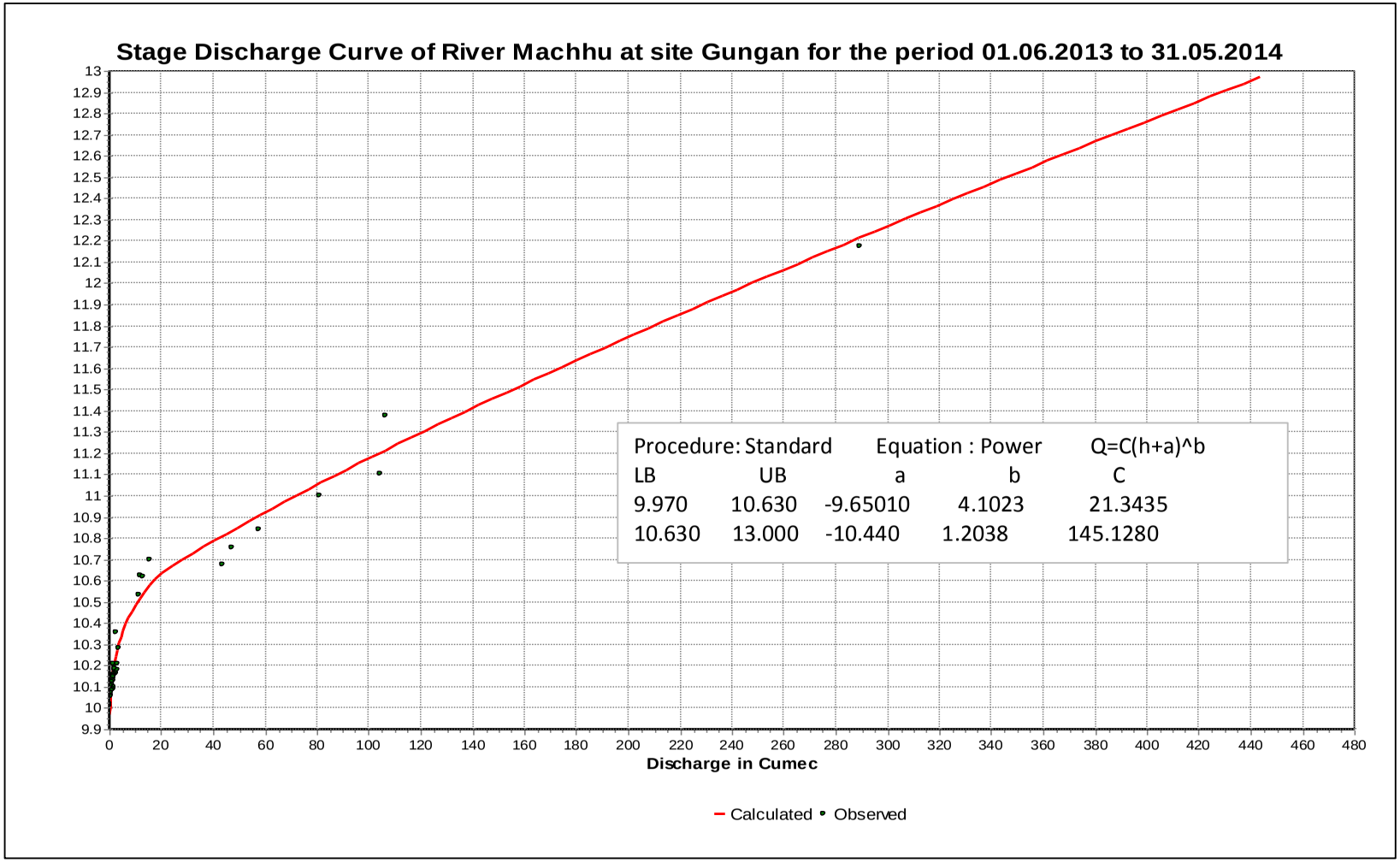
Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	9.710	0.000	9.670	0.000	9.640	0.000	9.620	0.000	9.580	0.000	9.520	0.000
2	9.710	0.000	9.670	0.000	9.640	0.000	9.620	0.000	9.580	0.000	9.520	0.000
3	9.700	0.000	9.670	0.000	9.640	0.000	9.610	0.000	9.580	0.000	9.520	0.000
4	9.700	0.000	9.670	0.000	9.640	0.000	9.610	0.000	9.570	0.000	9.520	0.000
5	9.700	0.000	9.670	0.000	9.640	0.000	9.610	0.000	9.570	0.000	9.510	0.000
6	9.700	0.000	9.670	0.000	9.640	0.000	9.610	0.000	9.570	0.000	9.510	0.000
7	9.700	0.000	9.670	0.000	9.640	0.000	9.610	0.000	9.570	0.000	9.510	0.000
8	9.690	0.000	9.670	0.000	9.630	0.000	9.610	0.000	9.570	0.000	9.510	0.000
9	9.690	0.000	9.660	0.000	9.630	0.000	9.610	0.000	9.570	0.000	9.510	0.000
10	9.690	0.000	9.660	0.000	9.630	0.000	9.610	0.000	9.570	0.000	9.500	0.000
11	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.560	0.000	9.500	0.000
12	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.560	0.000	9.500	0.000
13	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.560	0.000	9.500	0.000
14	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.560	0.000	9.500	0.000
15	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.560	0.000	9.500	0.000
16	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.550	0.000	9.490	0.000
17	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.550	0.000	9.490	0.000
18	9.690	0.000	9.660	0.000	9.630	0.000	9.600	0.000	9.550	0.000	9.490	0.000
19	9.680	0.000	9.660	0.000	9.630	0.000	9.590	0.000	9.550	0.000	9.490	0.000
20	9.680	0.000	9.660	0.000	9.630	0.000	9.590	0.000	9.550	0.000	9.490	0.000
21	9.680	0.000	9.660	0.000	9.620	0.000	9.590	0.000	9.540	0.000	9.490	0.000
22	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.540	0.000	9.490	0.000
23	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.540	0.000	9.480	0.000
24	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.540	0.000	9.480	0.000
25	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.530	0.000	9.480	0.000
26	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.530	0.000	9.480	0.000
27	9.680	0.000	9.650	0.000	9.620	0.000	9.590	0.000	9.530	0.000	9.470	0.000
28	9.680	0.000	9.650	0.000	9.620	0.000	9.580	0.000	9.520	0.000	9.470	0.000
29	9.670	0.000	9.640	0.000			9.580	0.000	9.520	0.000	9.470	0.000
30	9.670	0.000	9.640	0.000			9.580	0.000	9.520	0.000	9.470	0.000
31	9.670	0.000	9.640	0.000			9.580	0.000			9.470	0.000
Ten-Daily Mean												
I Ten-Daily	9.699	0.000	9.668	0.000	9.637	0.000	9.612	0.000	9.573	0.000	9.513	0.000
II Ten-Daily	9.688	0.000	9.660	0.000	9.630	0.000	9.598	0.000	9.555	0.000	9.495	0.000
III Ten-Daily	9.677	0.000	9.648	0.000	9.620	0.000	9.586	0.000	9.531	0.000	9.477	0.000
Monthly												
Min.	9.670	0.000	9.640	0.000	9.620	0.000	9.580	0.000	9.520	0.000	9.470	0.000
Max.	9.710	0.000	9.670	0.000	9.640	0.000	9.620	0.000	9.580	0.000	9.520	0.000
Mean	9.688	0.000	9.658	0.000	9.630	0.000	9.598	0.000	9.553	0.000	9.495	0.000

Peak Computed Discharge = 19.66 cumecs on 04/09/2016 **Corres. Water Level :10.63 m**

Lowest Computed Discharge = 0.130 cumecs on 11/09/2016 **Corres. Water Level :9.94 m**

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

Note:Missing values ignored while arriving at Annual Runoff

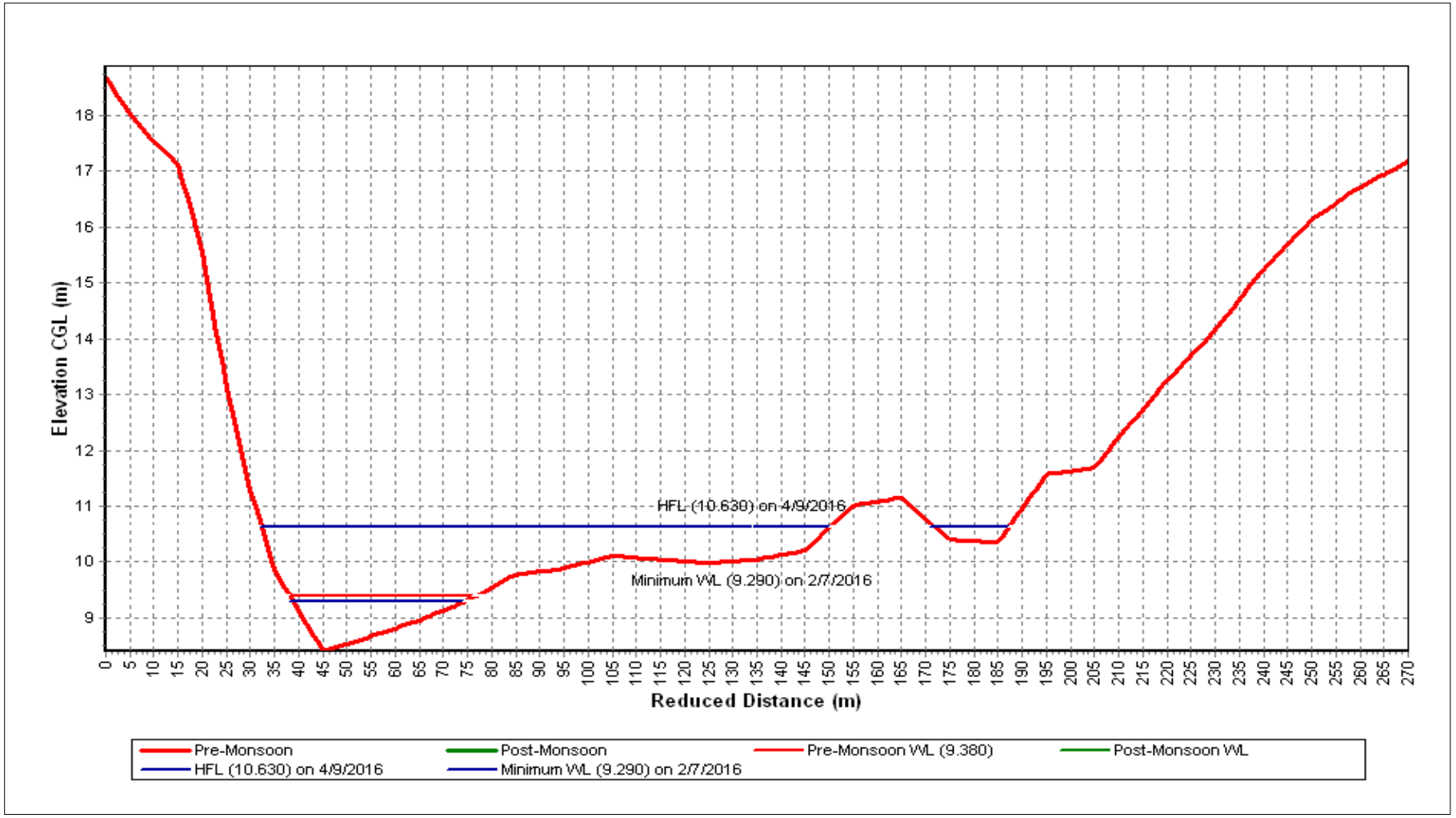


SD Curve of year 2013-14 used for estimation for the current year . There was no observed discharge data for current year

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

Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**



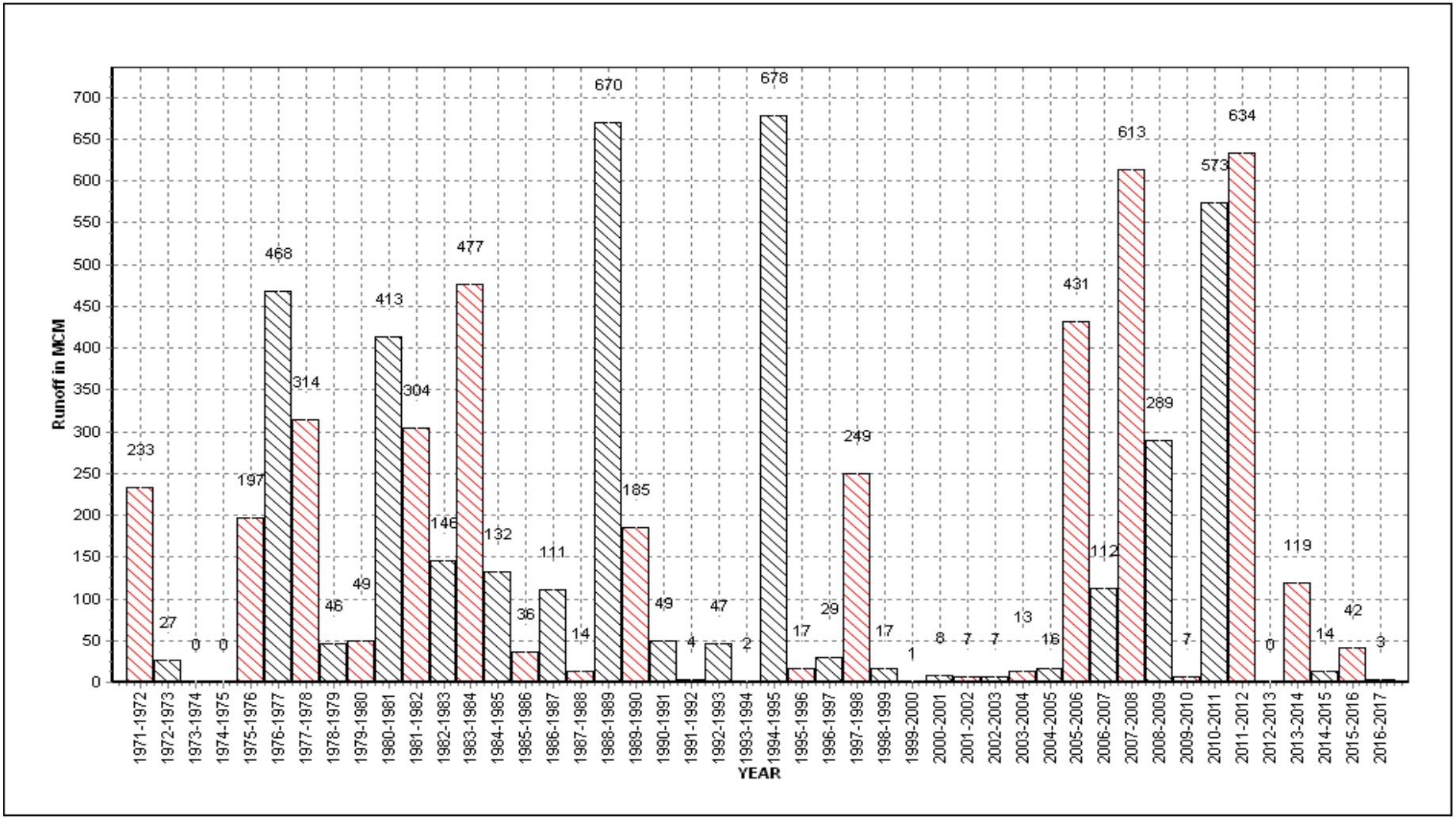
Historic Flood Level-24.595m on 11.08.1979 at 1400 hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 1971 - 2017

Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

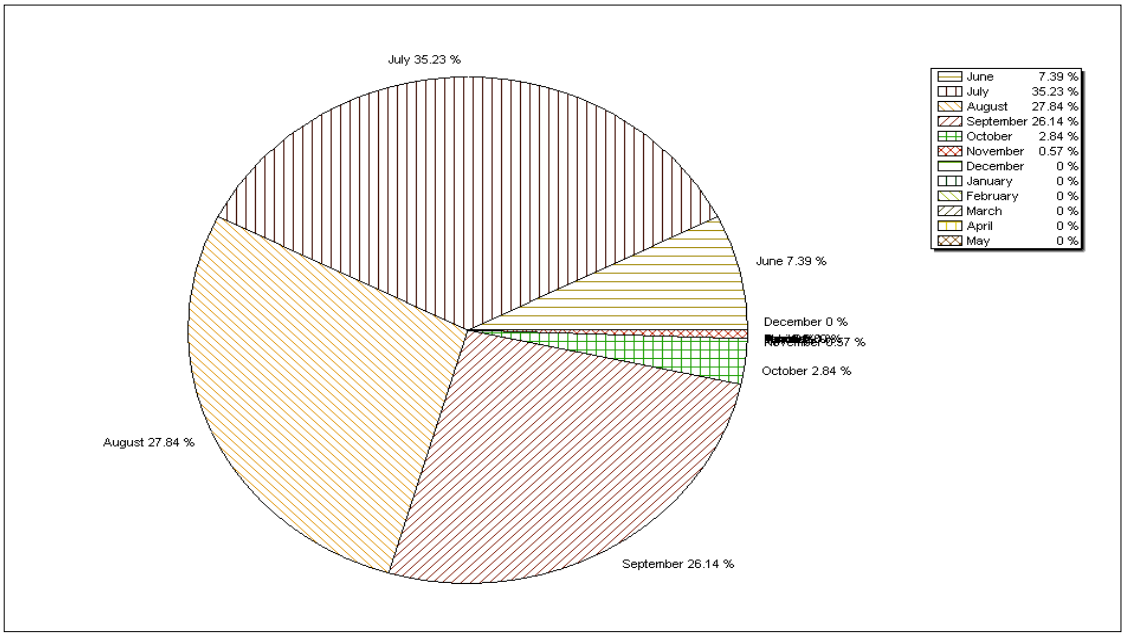


Note: Missing values have not been considered while arriving at Annual Runoff

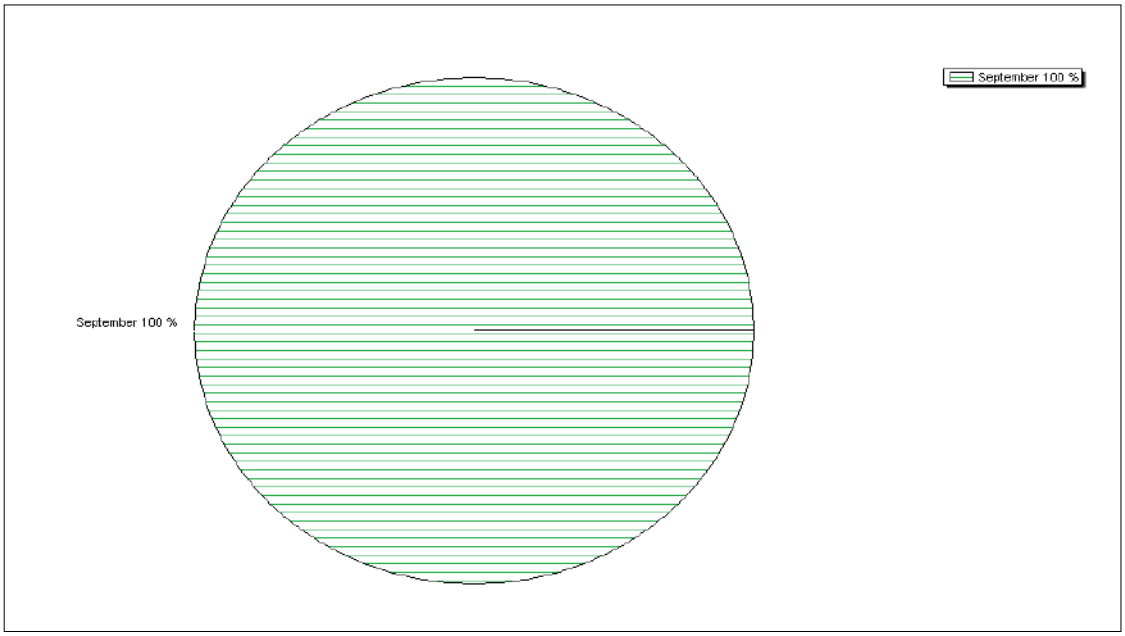
Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

Monthly Average Runoff based on period : 1971-2016



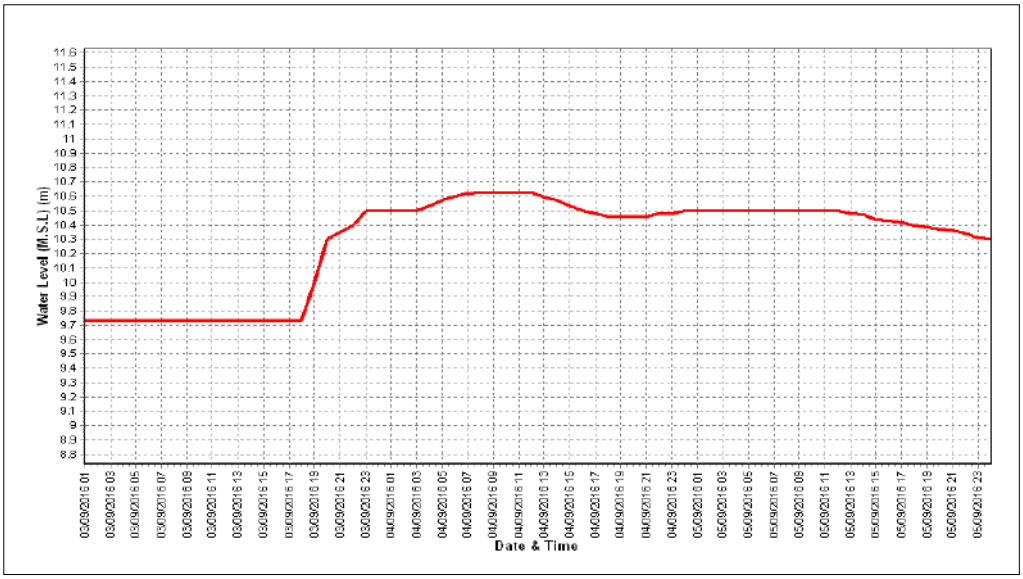
Monthly Runoff for the Year : 2016-2017



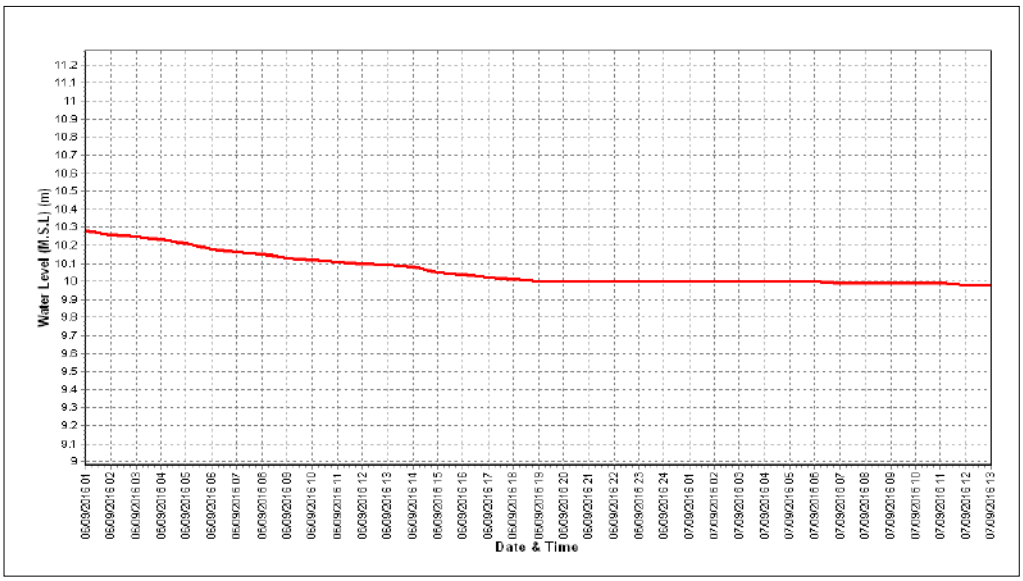
Station Name : Machhu at Gungan (01 02 03 001) **Division : Mahi Division, Gandhinagar**

Local River : Machhu **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

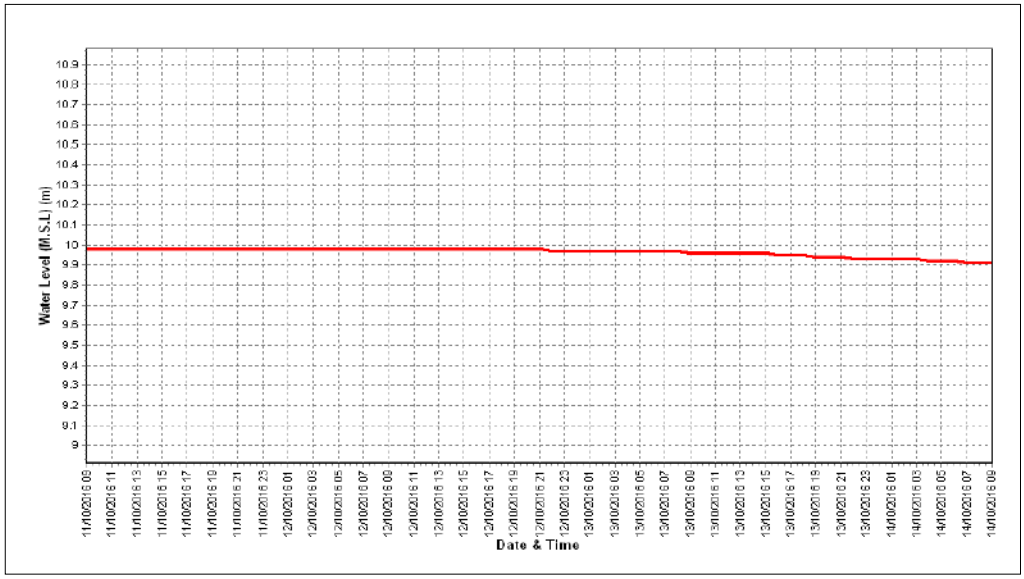
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	**:**	**2016-17**
Site	:	**Rupen at Sapawada**	**Code**	**:**	**01 02 04 001**
State	:	Gujarat	District		Mahesana
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Rupen
Tributary	:	-	Sub	:	
Sub-Sub Tributary	:		Local River	:	Rupen
Division	:	Mahi Division, Gandhinagar	Sub-Division	:	B.L.Sub Divn, Palanpur
Drainage Area	:	2125 Sq. Km.	Bank	:	Right
Latitude	:	23°32'54"	Longitude	:	72°00'52"
Zero of Gauge (m)	:	36.65 (m.s.l)	01/08/1989	-	04/04/1997
		36 (m.s.l)	05/04/1997		
		Opening Date	Closing Date		
Gauge	:	20/08/1989			
Discharge	:	31/08/1989			
Sediment	:				
Water Quality	:				

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

	Maximum			Minimum		
Year	Q (cumecs)	WL (m)	Date	Q (cumecs)	WL (m)	Date
1990-1991	490.6	40.000	25/08/1990	0.000	R Dry	25/01/1991
1991-1992	46.45	37.650	01/08/1991	0.000	R Dry	26/01/1992
1992-1993	221.2	38.315	09/09/1992	0.000	R Dry	30/12/1992
1993-1994	753.1	40.715	10/07/1993	0.000	R Dry	26/01/1994
1994-1995	964.3	40.900	03/08/1994	0.000	R Dry	26/01/1995
1995-1996	66.52	38.100	22/07/1995	0.000	R Dry	27/10/1995
1996-1997	R Dry					
1997-1998	325	43.000	27/06/1997	0.000	R Dry	04/02/1998
1998-1999	66.5	38.700	19/09/1998	0.000	R Dry	17/12/1998
1999-2000	7.725	37.600	23/06/1999	0.000	R Dry	09/11/1999
2000-2001	14.17	37.700	16/07/2000	0.000	R Dry	25/01/2001
2001-2002	19.58	37.800	17/06/2001	0.000	R Dry	25/01/2002
2002-2003	R Dry					
2003-2004	178	40.050	29/07/2003	0.000	R Dry	26/01/2004
2004-2005	129	39.800	09/08/2004	0.000	R Dry	09/05/2005
2005-2006	444.5	41.475	03/08/2005	0.000	R Dry	01/06/2005
2006-2007	474	40.250	16/08/2006	0.000	R Dry	01/06/2006
2007-2008	595.1	40.750	09/08/2007	0.000	36.5	01/06/2007
2008-2009	418.2	40.000	13/08/2008	0.000	36.3	18/08/2008
2009-2010	5.436	37.000	19/03/2010	0.000	36.06	01/06/2009
2010-2011	494.2	40.000	04/08/2010	0.000	R Dry	01/06/2010
2011-2012	58.80	37.76	14/09/2011	0.000	R Dry	01/06/2011
2012-2013	0.708	36.58	15/09/2012	0.000	R Dry	01/06/2012

2013-2014	77.83	37.9	14/07/2013	0.000	36.1	01/06/2013
2014-2015	8.953	37.3	03/08/2014	0.000	R Dry	01/06/2014
2015-2016	9.579	37.9	02/08/2015	0.000	36.1	01/06/2015
2016-2017	2.757	36.45	12/08/2016	0.000	R Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Rupen at Sapawada (01 02 04 001) **Division : Mahi Division, Gandhinagar**

Local River : Rupen **Sub-Division : B.L.Sub Divn, Palanpur**

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	R.Dry	0.000	36.100	0.000	36.150	0.000	36.350	0.000	36.200	0.000	36.100	0.000
2	R.Dry	0.000	36.100	0.000	36.150	0.000	36.300	0.000	36.200	0.000	36.100	0.000
3	R.Dry	0.000	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.100	0.000
4	R.Dry	0.000	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.100	0.000
5	R.Dry	0.000	36.100	0.000	36.100	0.000	36.250	0.000	36.200	0.000	36.100	0.000
6	R.Dry	0.000	36.100	0.000	36.100	0.000	36.250	0.000	36.200	0.000	36.100	0.000
7	36.100	0.000	36.100	0.000	36.100	0.000	36.400	2.134	36.200	0.000	36.100	0.000
8	36.100	0.000	36.150	0.000	36.100	0.000	36.450	1.549	36.200	0.000	36.100	0.000
9	36.100	0.000	36.150	0.000	36.150	0.000	36.400	1.371	36.200	0.000	36.100	0.000
10	36.100	0.000	36.150	0.000	36.250	0.000	36.350	0.000	36.200	0.000	36.100	0.000
11	36.100	0.000	36.100	0.000	36.450	1.873	36.300	0.000	36.200	0.000	36.100	0.000
12	36.100	0.000	36.100	0.000	36.450	2.757	36.300	0.000	36.200	0.000	36.100	0.000
13	36.100	0.000	36.100	0.000	36.450	1.729	36.300	0.000	36.200	0.000	36.100	0.000
14	36.100	0.000	36.100	0.000	36.450	2.371	36.300	0.000	36.200	0.000	36.100	0.000
15	36.100	0.000	36.100	0.000	36.350	1.227	36.300	0.000	36.200	0.000	36.100	0.000
16	36.100	0.000	36.100	0.000	36.200	0.000	36.300	0.000	36.200	0.000	36.100	0.000
17	36.100	0.000	36.100	0.000	36.200	0.000	36.300	0.000	36.200	0.000	36.100	0.000
18	36.100	0.000	36.100	0.000	36.200	0.000	36.250	0.000	36.200	0.000	36.100	0.000
19	36.100	0.000	36.100	0.000	36.200	0.000	36.250	0.000	36.200	0.000	36.100	0.000
20	36.100	0.000	36.100	0.000	36.200	0.000	36.200	0.000	36.200	0.000	36.100	0.000
21	36.100	0.000	36.100	0.000	36.200	0.000	36.200	0.000	36.200	0.000	36.100	0.000
22	36.100	0.000	36.100	0.000	36.200	0.000	36.200	0.000	36.200	0.000	36.100	0.000
23	36.100	0.000	36.100	0.000	36.200	0.000	36.200	0.000	36.200	0.000	36.100	0.000
24	36.100	0.000	36.100	0.000	36.200	0.000	36.200	0.000	36.200	0.000	36.100	0.000
25	36.100	0.000	36.100	0.000	36.250	0.000	36.200	0.000	36.200	0.000	36.100	0.000
26	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.200	0.000	36.100	0.000
27	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.200	0.000	36.100	0.000
28	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.200	0.000	36.100	0.000
29	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.200	0.000	36.100	0.000
30	36.100	0.000	36.100	0.000	36.300	0.000	36.200	0.000	36.200	0.000	36.100	0.000
31			36.150	0.000	36.300	0.000			36.200	0.000		0.000
Ten-Daily Mean												
I Ten-Daily	36.100	0.000	36.115	0.000	36.130	0.000	36.335	1.684	36.200	0.000	36.100	0.000
II Ten-Daily	36.100	0.000	36.100	0.000	36.315	1.991	36.280	0.000	36.200	0.000	36.100	0.000
III Ten-Daily	36.100	0.000	36.105	0.000	36.259	0.000	36.200	0.000	36.200	0.000	36.100	0.000
Monthly												
Min.	36.100	0.000	36.100	0.000	36.100	1.227	36.200	1.371	36.200	0.000	36.100	0.000
Max.	36.100	0.000	36.150	0.000	36.450	2.757	36.450	2.134	36.200	0.000	36.100	0.000
Mean	36.100	0.000	36.106	0.000	36.235	1.991	36.272	1.684	36.200	0.000	36.100	0.000

Annual Runoff in MCM = 1 Annual Runoff in mm = 1

Peak Observed Discharge = 2.757 cumecs on 12/08/2016 Corres. Water Level :36.45 m

Lowest Observed Discharge = 1.227 cumecs on 15/08/2016 Corres. Water Level :36.35 m

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

Note:Missing values ignored while arriving at Annual Runoff

Stage-Discharge Data for the period 2016 - 2017

Station Name : Rupen at Sapawada (01 02 04 001) **Division : Mahi Division, Gandhinagar**

Local River : Rupen **Sub-Division : B.L.Sub Divn, Palanpur**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
2	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
3	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
4	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
5	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
6	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
7	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
8	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
9	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
10	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
11	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
12	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
13	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
14	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
15	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
16	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
17	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
18	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
19	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
20	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
21	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
22	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
23	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
24	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
25	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
26	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
27	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
28	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
29	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
30	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
31	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Ten-Daily Mean												
I Ten-Daily	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
II Ten-Daily	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
III Ten-Daily	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Monthly												
Min.	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Max.	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000
Mean	36.300	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000	R.Dry	0.000

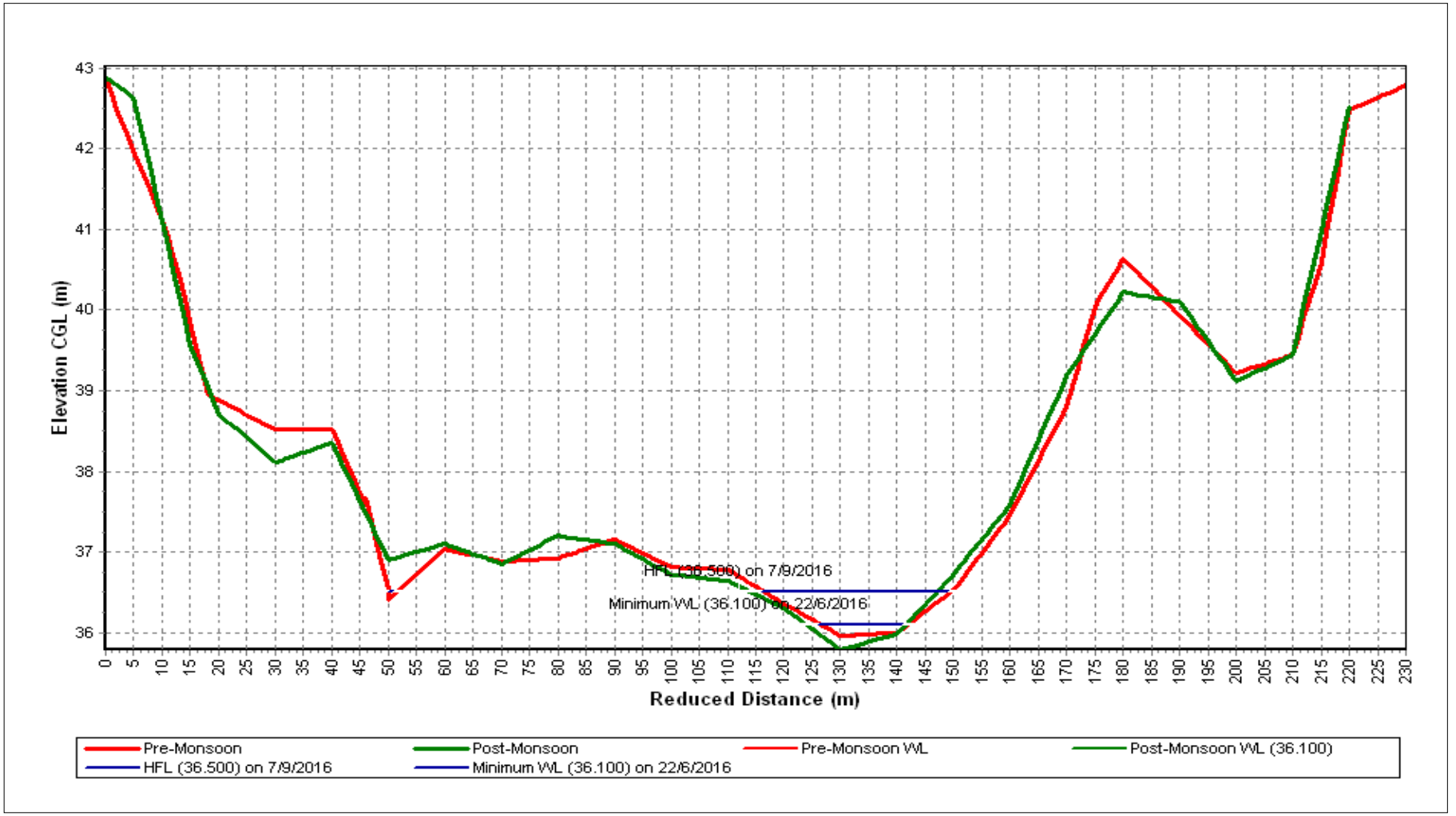
Q: Observed/Computed Discharge in cumecs WL:Corresponding Mean Water Level(m.s.l) in m *:Computed Discharge

Note:Missing values ignored while arriving at Annual Runoff

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

Station Name : Rupen at Sapawada (01 02 04 001) **Division : Mahi Division, Gandhinagar**

Local River : Rupen **Sub-Division : B.L.Sub Divn, Palanpur**



Historical Flood Level-43.0m on 27.08.1997 at 0800hrs

Note: HFL marked on graph denotes Maximum Water Level observed during the Water Year 2016-17

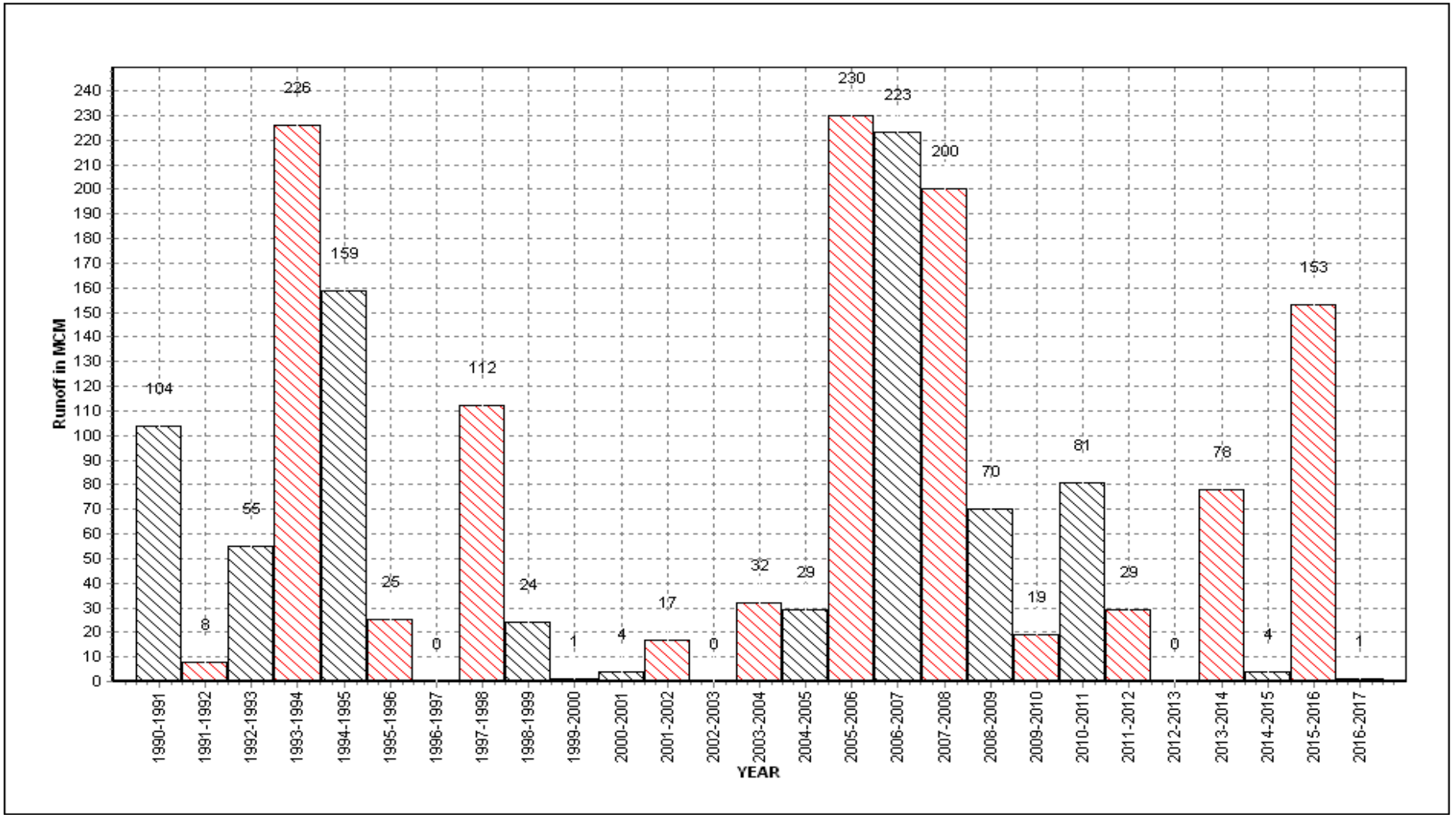
Annual Runoff Values for the period: 1990 - 2017

Station Name : Rupen at Sapawada (01 02 04 001)

Local River : Rupen

Division : Mahi Division, Gandhinagar

Sub-Division : B.L.Sub Divn, Palanpur

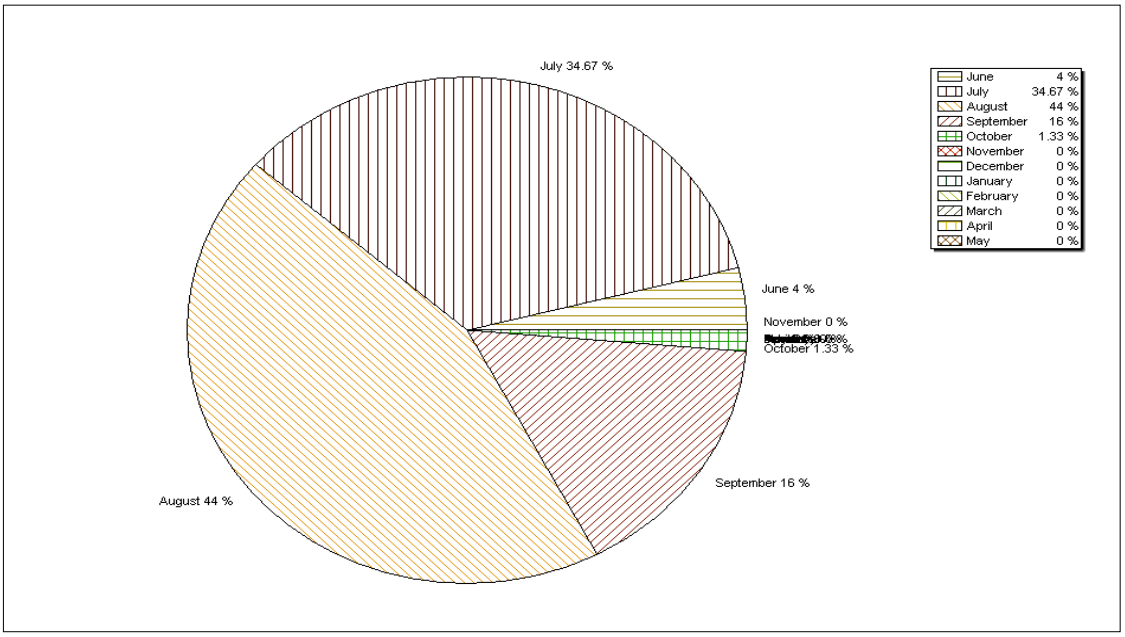


Note: Missing values have not been considered while arriving at Annual Runoff

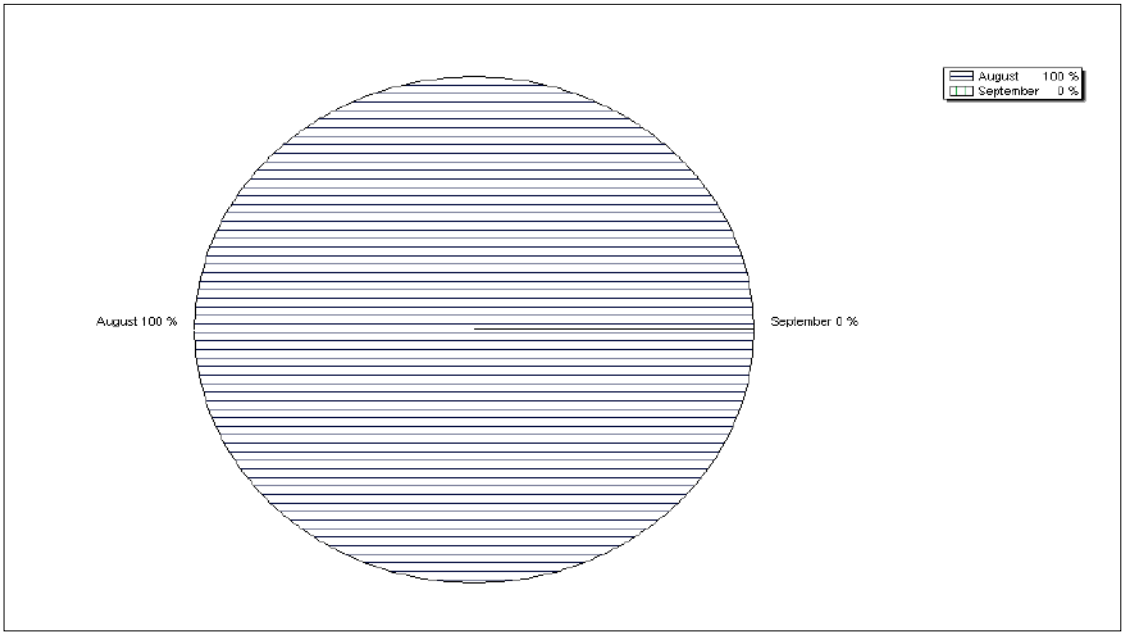
Station Name : Rupen at Sapawada (01 02 04 001) **Division : Mahi Division, Gandhinagar**

Local River : Rupen **Sub-Division : B.L.Sub Divn, Palanpur**

Monthly Average Runoff based on period : 1990-2016



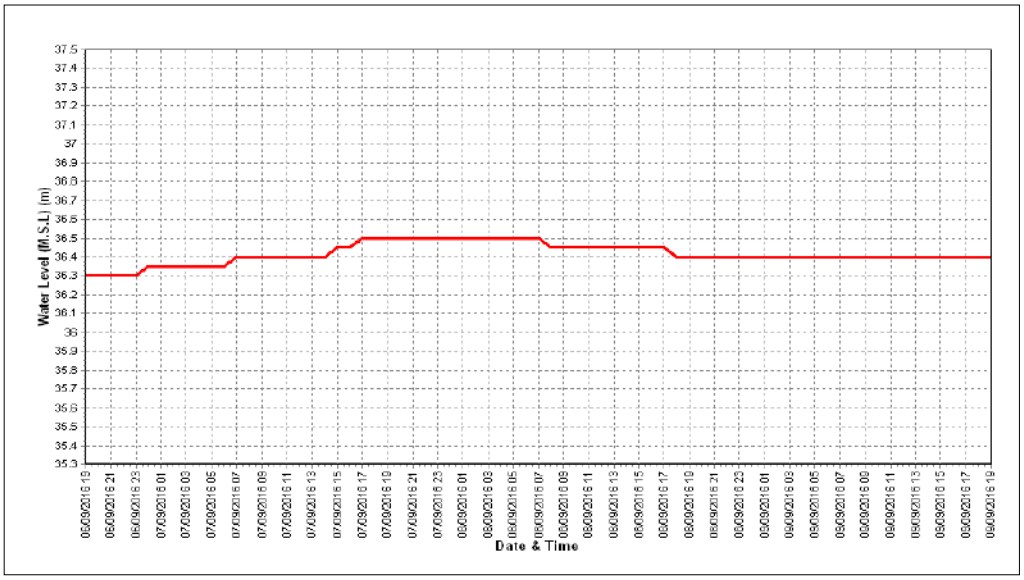
Monthly Runoff for the Year : 2016-2017



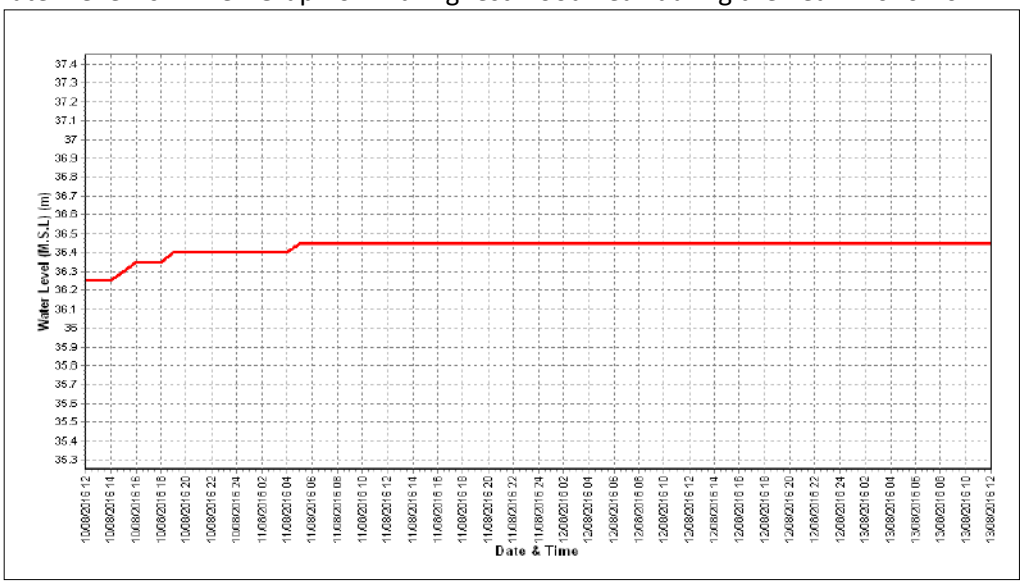
Station Name : Rupen at Sapawada (01 02 04 001) **Division : Mahi Division, Gandhinagar**

Local River : Rupen **Sub-Division : B.L.Sub Divn, Palanpur**

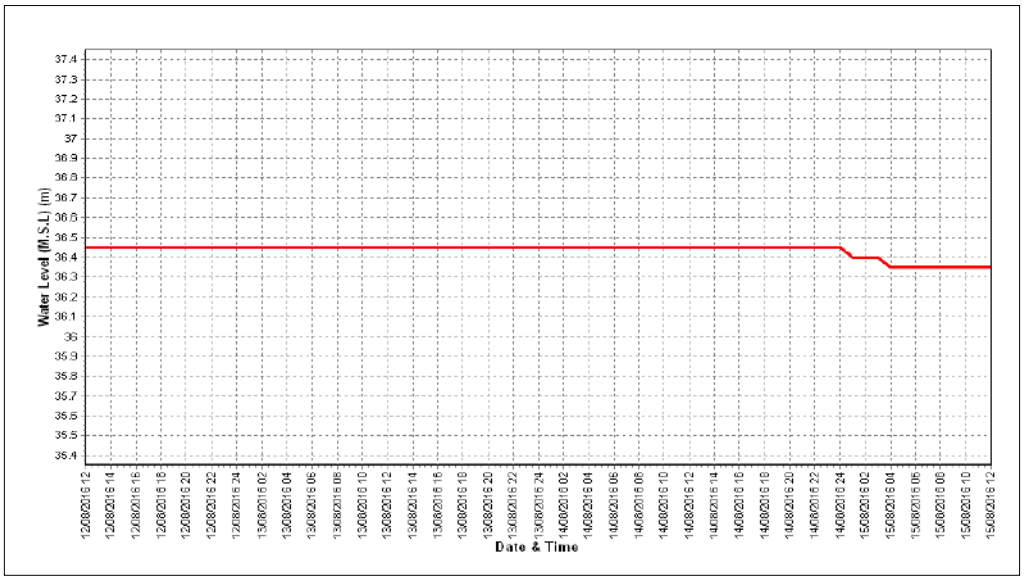
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs

HISTORY SHEET

			Water Year	:	**2016-17**
Site	:	**Machhundri at Una**	**Code**	:	**01 02 14 001**
State	:	Gujarat	District		Somnath (Gir)
Basin	:	WFR of Kach.-Saur. & Luni	Independent River	:	Machhundri
Tributary	:	-	Sub Tributary	:	-
Sub-Sub Tributary	:	-	Local River	:	Machhundri
Division	:	E.E., Ahmedabad	Sub-Division	:	Ahmedabad
Drainage Area	:	395.01 Sq. Km.	Bank	:	Left
Latitude	:	20°49'42"	Longitude	:	71°02'51"
Zero of Gauge (m)	:	15.5 (m.s.l)	27/07/2014		
		Opening Date	Closing Date		
Gauge	:	26/07/2014			
Discharge	:	26/07/2014			
Sediment	:				
Water Quality	:				

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

	Maximum			Minimum		
Year	**Q (cumecs)**	**WL (m)**	**Date**	**Q (cumecs)**	**WL (m)**	**Date**
2014-2015	34.83	16.925	04/09/2014	0.000	River Dry	01/06/2014
2015-2016	7.959	16.705	21/09/2015	0.000	River Dry	01/06/2015
2016-2017	18.69	16.91	19/09/2016	0.000	River Dry	01/06/2016

Stage-Discharge Data for the period 2016 - 2017

Station Name : Machhundri at Una (01 02 09 002) **Division : E.E., Ahmedabad**

Local River : Machhundri **Sub-Division : Ahmedabad**

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	R. Dry	0.000	R.D	0.000	16.593	3.043	16.608	4.049	16.680	5.424	16.540	2.890 *
2	R. Dry	0.000	R.D	0.000	16.485	1.126	16.600	3.774	16.670	4.723	16.535	2.890 *
3	R. Dry	0.000	16.600	3.741	16.478	1.071	16.590	3.306	16.670	4.464	16.535	2.890 *
4	R. Dry	0.000	16.375	0.158	16.470	1.039	16.580	4.037	16.715	9.487	16.530	2.680 *
5	R. Dry	0.000	16.300	0.069	16.590	4.048	16.570	3.266	16.720	8.790	16.530	2.680 *
6	R. Dry	0.000	16.300	0.000	16.590	3.355	16.560	2.933	16.810	11.05	16.530	2.680 *
7	R. Dry	0.000	16.300	0.000	16.585	3.734	16.560	2.593	16.820	10.82	16.520	2.470 *
8	R. Dry	0.000	16.300	0.000	16.585	3.702	16.552	2.347	16.900	15.05	16.520	2.470 *
9	R. Dry	0.000	16.300	0.000	16.590	4.014	16.535	2.129	16.808	10.97	16.510	2.270 *
10	R. Dry	0.000	16.300	0.000	16.710	7.590 *	16.544	2.411	16.750	10.02	16.500	2.080 *
11	R. Dry	0.000	16.300	0.000	16.645	5.700 *	16.545	2.213	16.730	9.272	16.490	1.890 *
12	R. Dry	0.000	16.300	0.000	16.600	4.320 #	16.533	1.832	16.710	7.189	16.480	1.720 *
13	R. Dry	0.000	16.300	0.000	16.605	4.580 #	16.500	1.731	16.710	8.049	16.470	1.540 *
14	R. Dry	0.000	16.300	0.000	16.610	4.580 #	16.533	1.870	16.695	7.680	16.470	1.540 *
15	R. Dry	0.000	16.300	0.000	16.600	4.869	16.539	2.458	16.690	6.190	16.460	1.380 *
16	R. Dry	0.000	16.300	0.000	16.630	5.204	16.711	6.307	16.680	7.116	16.460	1.380 *
17	R. Dry	0.000	16.300	0.000	16.625	4.981	16.614	3.923	16.650	7.300	16.460	1.380 *
18	R. Dry	0.000	16.300	0.000	16.610	4.813	16.713	7.258	16.640	6.323	16.450	1.220 *
19	R. Dry	0.000	16.300	0.000	16.620	4.668	16.910	18.69 #	16.630	5.153	16.450	1.220 *
20	R. Dry	0.000	16.300	0.000	16.625	5.801	16.790	10.52	16.615	5.622	16.450	1.220 *
21	R. Dry	0.000	16.300	0.000	16.605	4.811	16.910	16.27	16.605	4.580 *	16.440	1.070 *
22	R. Dry	0.000	16.300	0.000	16.595	4.965	16.810	11.34	16.600	4.518	16.440	1.070 *
23	R. Dry	0.000	16.300	0.000	16.595	4.320 *	16.913	14.12	16.595	4.793	16.440	1.070 *
24	R. Dry	0.000	16.300	0.000	16.585	4.150	16.800	10.90 #	16.590	4.060 *	16.430	0.930 *
25	R. Dry	0.000	16.500	2.192	16.580	4.030	16.748	9.721	16.590	4.664	16.430	0.930 *
26	R. Dry	0.000	16.370	0.274	16.610	5.274	16.720	8.222	16.590	4.676	16.420	0.790 *
27	R. Dry	0.000	16.330	0.207	16.600	4.567	16.700	6.451	16.585	3.765	16.420	0.790 *
28	R. Dry	0.000	16.310	0.074	16.850	12.98 #	16.690	7.065	16.560	3.525	16.410	0.660 *
29	R. Dry	0.000	16.310	0.000 *	16.650	5.356	16.695	6.436	16.560	2.978	16.410	0.660 *
30	R. Dry	0.000	16.390	0.474	16.620	4.946	16.690	6.930 #	16.550	2.915	16.410	0.660 *
31			16.385	0.420 *	16.618	4.452			16.540	2.890 *		
Ten-Daily Mean												
I Ten-Daily	R. Dry	0.000	16.347	0.397	16.567	3.272	16.570	3.085	16.754	9.078	16.525	2.600
II Ten-Daily	R. Dry	0.000	16.300	0.000	16.617	4.952	16.639	5.680	16.675	6.989	16.464	1.449
III Ten-Daily	R. Dry	0.000	16.345	0.331	16.628	5.441	16.768	9.745	16.579	3.942	16.425	0.863
Monthly												
Min.	R. Dry	0.000	16.300	0.000	16.470	1.039	16.500	1.731	16.540	2.890	16.410	0.660
Max.	R. Dry	0.000	16.600	3.741	16.850	12.98	16.913	18.69	16.900	15.05	16.540	2.890
Mean	R. Dry	0.000	16.330	0.245	16.605	4.584	16.659	6.17	16.666	6.582	16.471	1.637

Annual Runoff in MCM = 51 Annual Runoff in mm = 130

Peak Observed Discharge = 18.69 cumecs on 19/09/2016 Corres. Water Level :16.91 m

Lowest Observed Discharge = 0.000 cumecs on 01/06/2016

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 Data for the period 2016 - 2017

Station Name : Machhundri at Una (01 02 09 002) **Division : E.E., Ahmedabad**

Local River : Machhundri **Sub-Division : Ahmedabad**

Day	Dec		Jan		Feb		Mar		Apr		May	
	W.L	Q	WL	Q	WL	Q	WL	Q	WL	Q	WL	Q
1	16.410	0.660 *	16.320	0.000	16.285	0.000	16.270	0.000	16.220	0.000	16.175	0.000
2	16.410	0.660 *	16.320	0.000	16.280	0.000	16.270	0.000	16.210	0.000	16.175	0.000
3	16.410	0.660 *	16.320	0.000	16.280	0.000	16.270	0.000	16.200	0.000	16.175	0.000
4	16.405	0.660 *	16.310	0.000	16.280	0.000	16.270	0.000	16.200	0.000	16.175	0.000
5	16.405	0.660 *	16.300	0.000	16.280	0.000	16.270	0.000	16.200	0.000	16.175	0.000
6	16.400	0.540 *	16.290	0.000	16.280	0.000	16.265	0.000	16.200	0.000	16.175	0.000
7	16.395	0.540 *	16.290	0.000	16.280	0.000	16.265	0.000	16.200	0.000	16.175	0.000
8	16.385	0.430 *	16.290	0.000	16.280	0.000	16.265	0.000	16.200	0.000	16.170	0.000
9	16.385	0.430 *	16.290	0.000	16.280	0.000	16.265	0.000	16.195	0.000	16.170	0.000
10	16.375	0.320 *	16.290	0.000	16.275	0.000	16.265	0.000	16.190	0.000	16.170	0.000
11	16.375	0.320 *	16.290	0.000	16.275	0.000	16.265	0.000	16.190	0.000	16.170	0.000
12	16.375	0.320 *	16.290	0.000	16.275	0.000	16.265	0.000	16.190	0.000	16.170	0.000
13	16.370	0.220 *	16.290	0.000	16.275	0.000	16.265	0.000	16.190	0.000	16.170	0.000
14	16.370	0.220 *	16.290	0.000	16.275	0.000	16.260	0.000	16.190	0.000	16.170	0.000
15	16.370	0.220 *	16.290	0.000	16.275	0.000	16.260	0.000	16.190	0.000	16.170	0.000
16	16.370	0.220 *	16.290	0.000	16.275	0.000	16.255	0.000	16.190	0.000	16.170	0.000
17	16.365	0.220 *	16.290	0.000	16.275	0.000	16.250	0.000	16.190	0.000	16.170	0.000
18	16.360	0.120 *	16.290	0.000	16.275	0.000	16.250	0.000	16.190	0.000	16.170	0.000
19	16.350	0.000	16.285	0.000	16.275	0.000	16.245	0.000	16.190	0.000	16.170	0.000
20	16.345	0.000	16.285	0.000	16.275	0.000	16.240	0.000	16.180	0.000	16.170	0.000
21	16.345	0.000	16.285	0.000	16.275	0.000	16.230	0.000	16.180	0.000	16.170	0.000
22	16.335	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.180	0.000	16.170	0.000
23	16.330	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.180	0.000	16.170	0.000
24	16.325	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.180	0.000	16.170	0.000
25	16.320	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.175	0.000	16.170	0.000
26	16.320	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.175	0.000	16.170	0.000
27	16.320	0.000	16.285	0.000	16.275	0.000	16.225	0.000	16.175	0.000	16.170	0.000
28	16.320	0.000	16.285	0.000	16.275	0.000	16.220	0.000	16.175	0.000	16.170	0.000
29	16.320	0.000	16.285	0.000			16.220	0.000	16.175	0.000	16.170	0.000
30	16.320	0.000	16.285	0.000			16.220	0.000	16.175	0.000	16.170	0.000
31	16.320	0.000	16.285	0.000			16.220	0.000				
Ten-Daily Mean												
I Ten-Daily	16.398	0.556	16.302	0.000	16.280	0.000	16.267	0.000	16.201	0.000	16.174	0.000
II Ten-Daily	16.365	0.186	16.289	0.000	16.275	0.000	16.256	0.000	16.189	0.000	16.170	0.000
III Ten-Daily	16.325	0.000	16.285	0.000	16.275	0.000	16.224	0.000	16.177	0.000	16.170	0.000
Monthly												
Min.	16.320	0.000	16.285	0.000	16.275	0.000	16.220	0.000	16.175	0.000	16.170	0.000
Max.	16.410	0.660	16.320	0.000	16.285	0.000	16.270	0.000	16.220	0.000	16.175	0.000
Mean	16.361	0.239	16.292	0	16.277	0	16.248	0	16.189	0	16.171	0

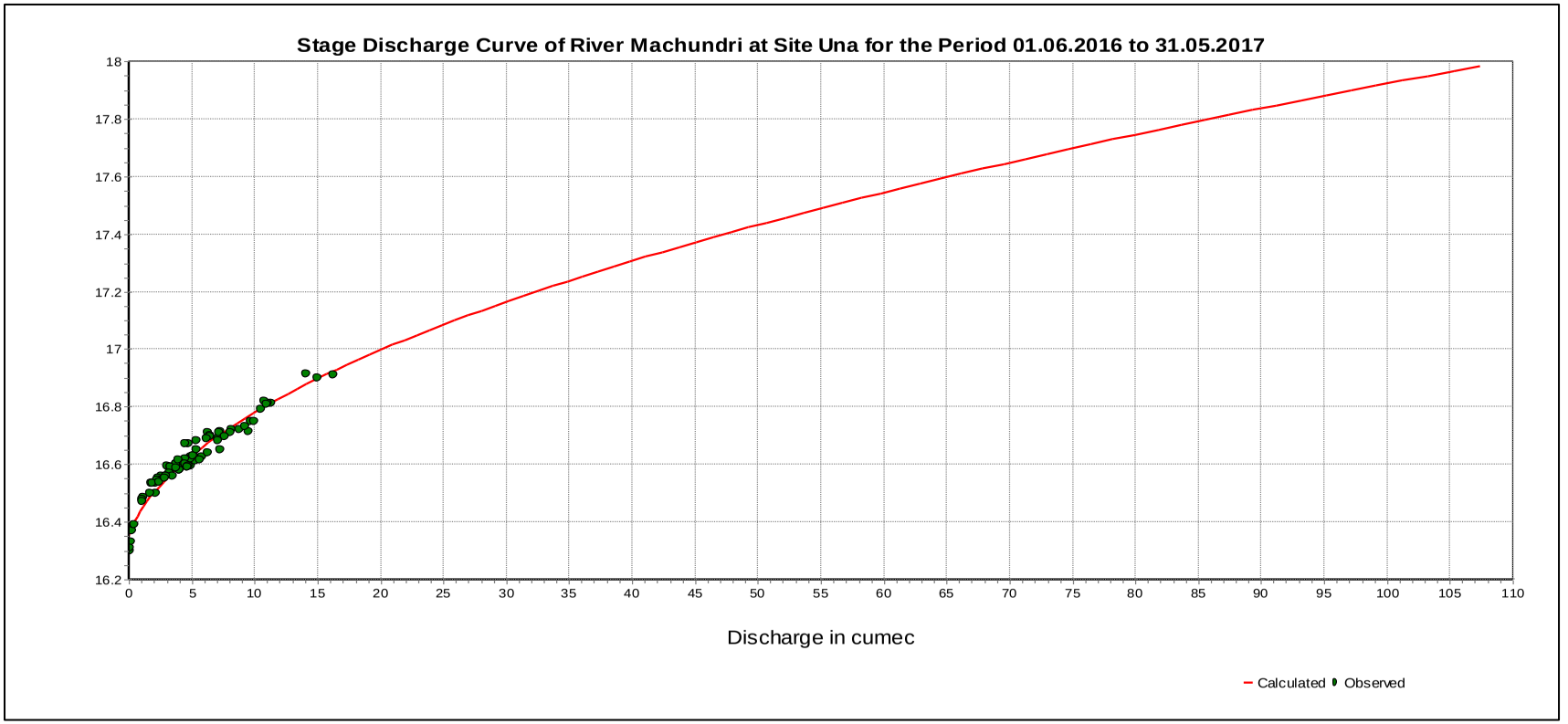
Peak Computed Discharge = 7.590 cumecs on 10/08/2016 Corres. Water Level :16.71 m

Lowest Computed Discharge = 0.000 cumecs on 29/07/2016 Corres. Water Level :16.31 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



Procedure - Standard

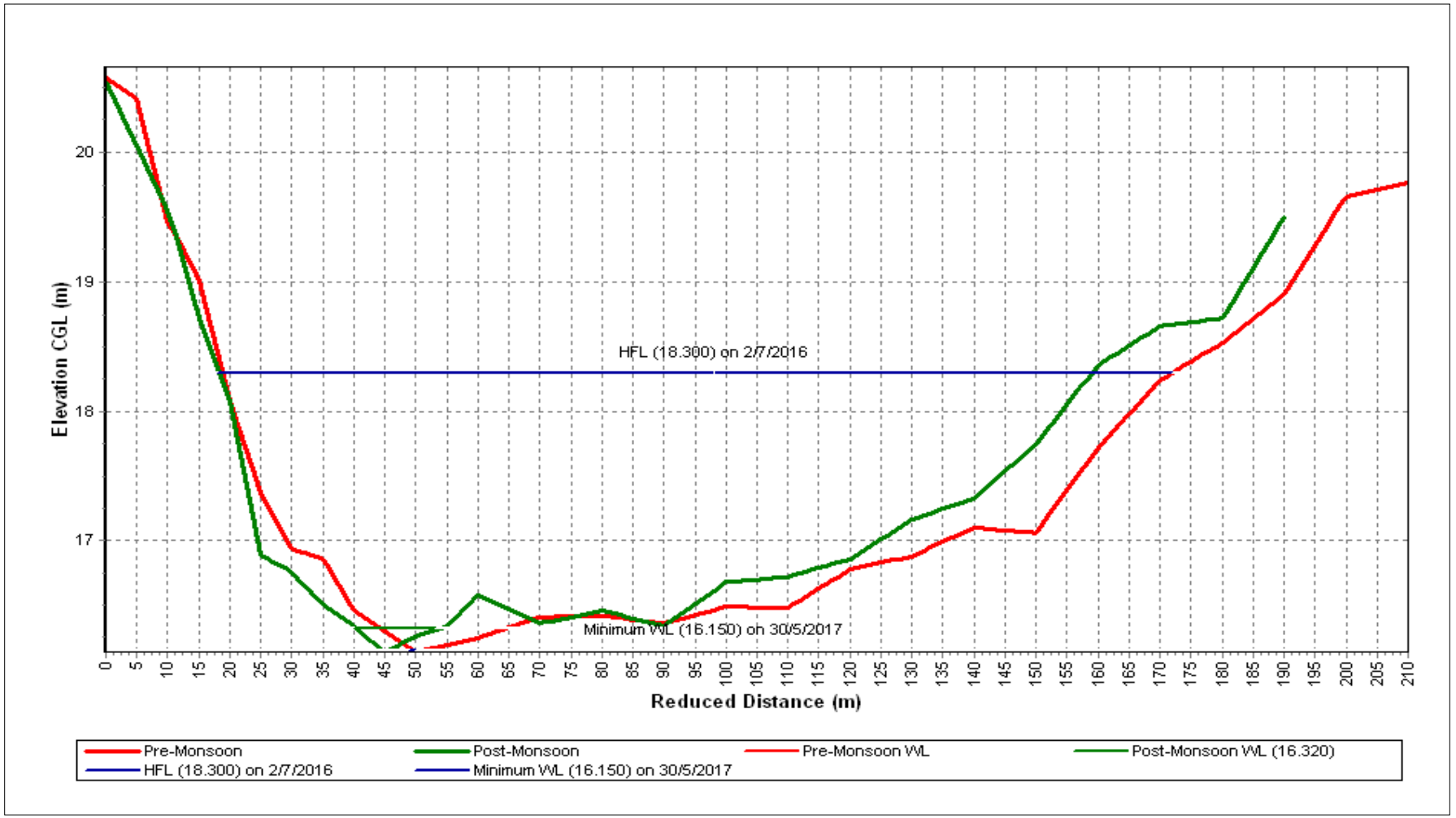
Equation Type - Power Q=a+b*h+c*(h^2)

LB	UB	a	b	c
16.3	18	9280.973	-1143.56	35.224

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

Station Name : Machhundri at Una (01 02 09 002) **Division : E.E., Ahmedabad**

Local River : Machhundri **Sub-Division : Ahmedabad**



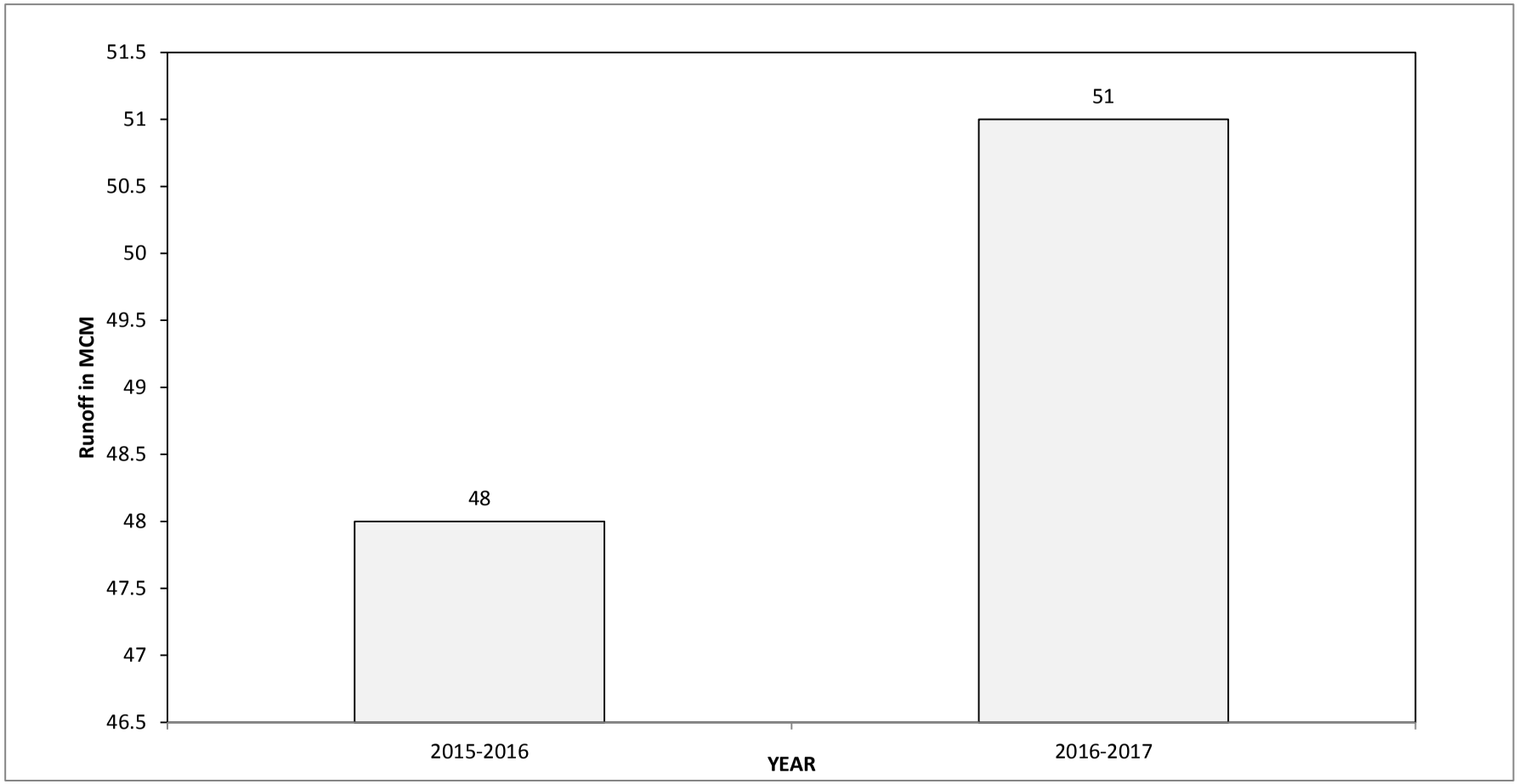
Historical Flood level - sufficient data not available

Note: HFL marked on graph denotes Max Water Level observed during the Water Year 2016-17

Annual Runoff Values for the period: 2016 - 2017

Station Name : Machhundri at Una (01 02 09 002) **Division : E.E., Ahmedabad**

Local River : Machhundri **Sub-Division : Ahmedabad**

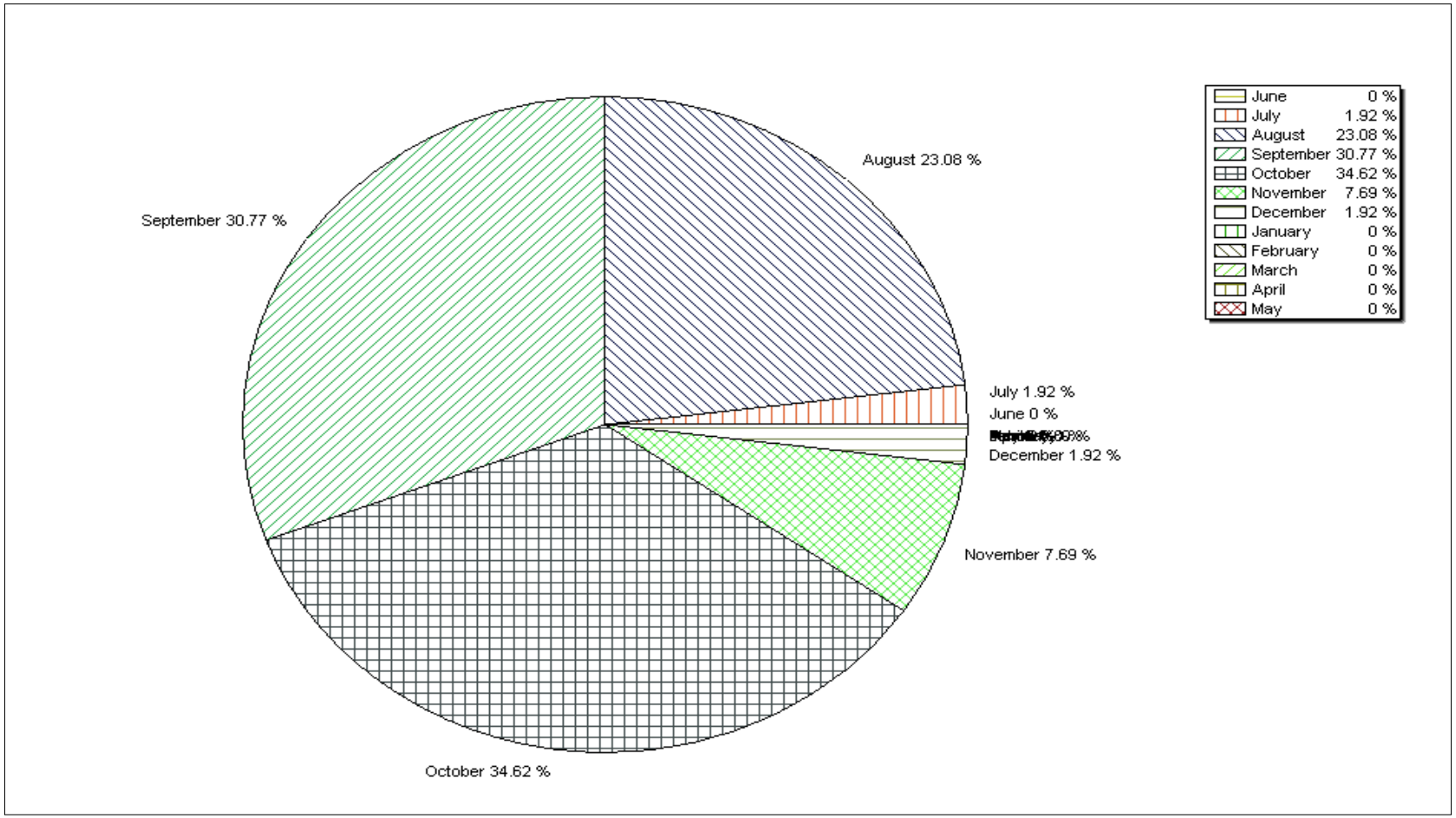


Note: Missing values have not been considered while arriving at Annual Runoff

Station Name : Machhundri at Una (01 02 09 002)
Local River : Machhundri

Division : E.E., Ahmedabad
Sub-Division : Ahmedabad

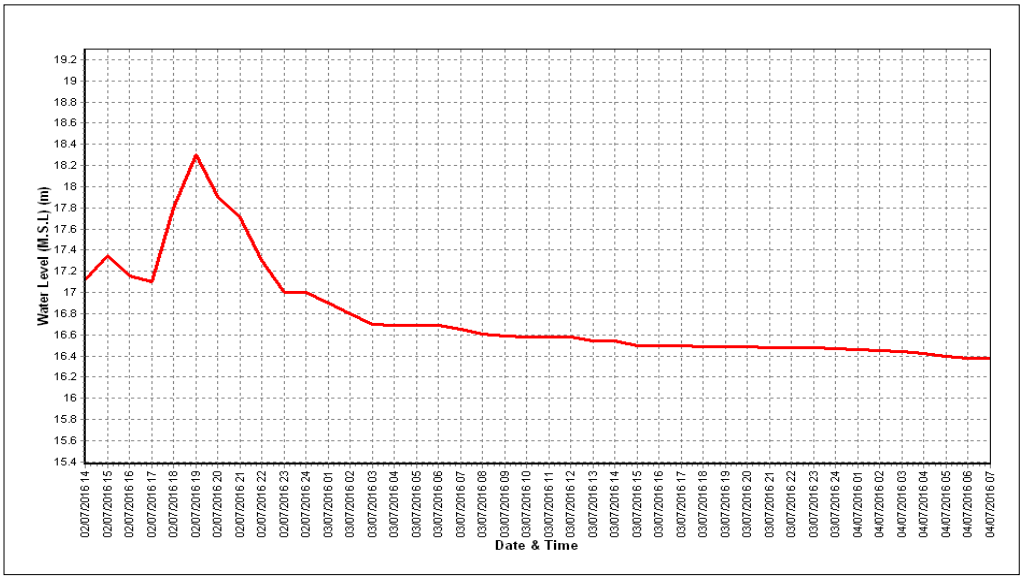
Monthly Runoff for the Year : 2016-2017



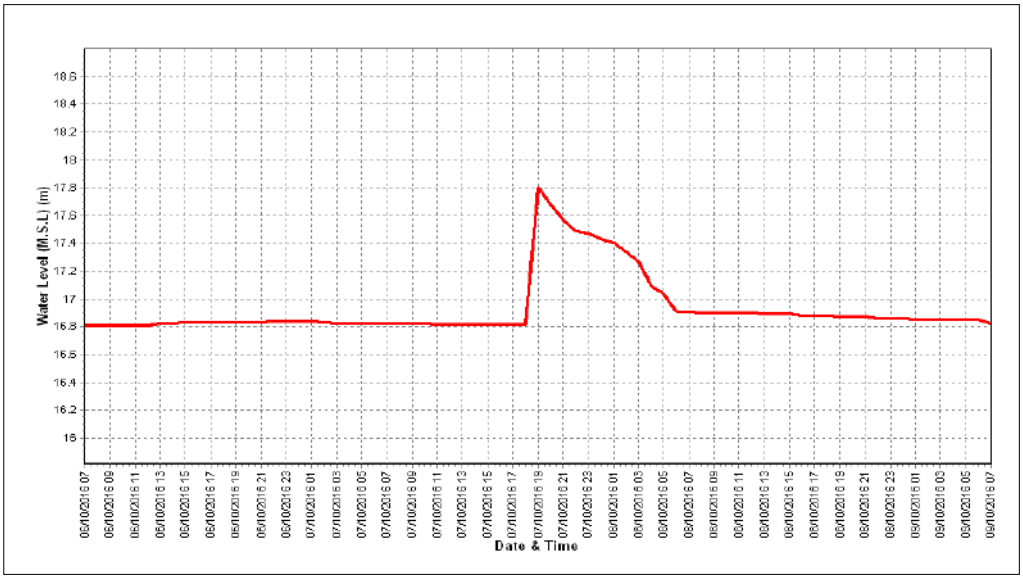
Station Name : Machhundri at Una (01 02 09 002) **Division : E.E., Ahmedabad**

Local River : Machhundri **Sub-Division : Ahmedabad**

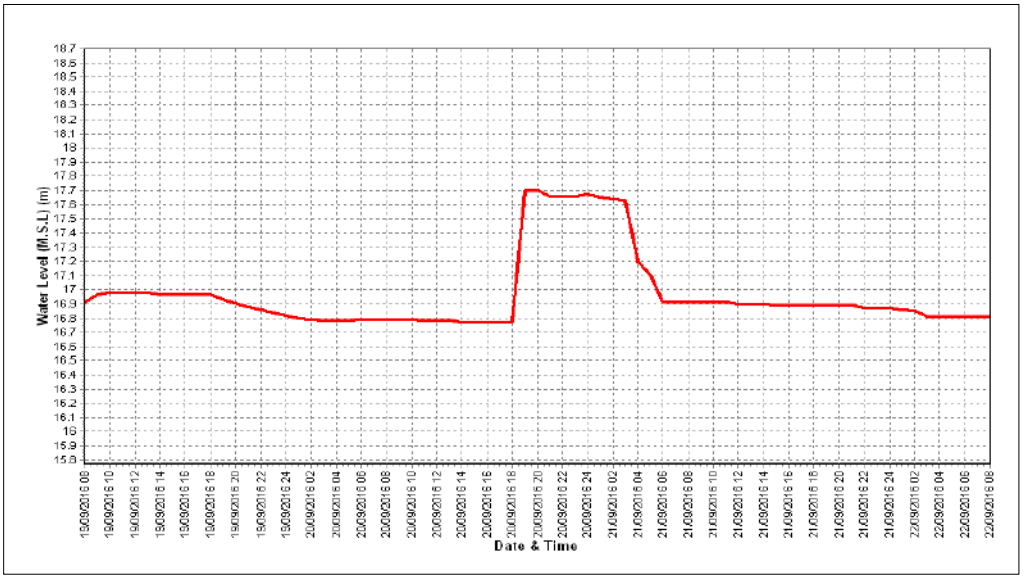
Water Level vs. Time - Graph of Highest Flood Peak during the Year : 2016-2017



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



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



Time Span: 72 Hrs